outcomes. Dr. Wanigatunga will discuss the association of physical activity volume and fragmentation with the frailty phenotype in the Study to Understand Vitamin D and Fall Reduction in You (STURDY). Dr. Cai will present evidence on the association of physical activity quantities and patterns with measures of visual impairment in the Baltimore Longitudinal Study of Aging. Ms. Qiao will present a novel accelerometry-derived measure of performance fatigability in the Developmental Epidemiologic Cohort Study. Finally, Dr. Urbanek will discuss the role of accelerometry-derived free-living gait cadence in defining fall risk in STURDY. Collectively, these presentations highlight critical associations between objective measures of physical activity and health outcomes in older adults and illuminate the need for thinking beyond MVPA to improve prevention and intervention efforts.

ACCELEROMETER-DERIVED PATTERNS OF PHYSICAL ACTIVITY AND INCIDENT FRAILTY

Amal Wanigatunga,[1] Yurun Cai,[1] Jacek Urbanek,[2] David Roth,[3] Jeremy Walston,[4] Karen Bandeen-Roche,[1] Lawrence Appel,[2] and Jennifer Schrack,[1] *1. Johns Hopkins Bloomberg School of Public Health, Baltimore, Maryland, United States, 2. Johns Hopkins School of Medicine, Baltimore, Maryland, United States, 3. Johns Hopkins University, Baltimore, Maryland, United States, 4. Johns Hopkins University School of Medicine, Baltimore, Maryland, United States*

Low physical activity (PA) is a common phenotype of frailty, but whether disengagement of daily lifestyle PA signals impending frailty remains unexplored. Using STURDY (Study to Understand Fall Reduction and Vitamin D in You) data from 499 robust/prefrail adults (mean age=76 + 5 years; 42% women), we examined whether accelerometer patterns (activity counts/day, active minutes/day, and activity fragmentation) were prospectively associated with incident frailty over 2 years of follow-up; 48 (10%) participants developed frailty. In Discrete-Cox hazard models adjusted for demographics, medical conditions, and device wear days, every 30 min/day higher baseline active time, 100,000 more activity counts/day, and 1% lower activity fragmentation was associated with a 13% (p=0.003), 10% (p=0.001), and 8% (p<0.001) lower risk of frailty, respectively. Our results show that both reduced amounts and fragmented patterns of daily PA captured from accelerometry are associated with phenotypic frailty and might signal frailty onset.

VISUAL IMPAIRMENT AND OBJECTIVELY MEASURED PHYSICAL ACTIVITY IN MIDDLE-AGED AND OLDER ADULTS

Yurun Cai,[1] Jennifer Schrack,[1] Jian-Yu E,[2] Amal Wanigatunga,[1] Jacek Urbanek,[3] Eleanor Simonsick,[4] and Bonnielin Swenor,[3] *1. Johns Hopkins Bloomberg School of Public Health, Baltimore, Maryland, United States, 2. Johns hopkins Bloomberg School of Medicine, Baltimore, Maryland, United States, 3. Johns Hopkins School of Medicine, Baltimore, Maryland, United States, 4. National Instute on Aging/NIH, Baltimore, Maryland, United States*

Vision loss is associated with restricted physical activity (PA), yet the relationship between multiple domains of vision measures and objectively measured PA, especially activity patterns, in mid-to-late life remains unclear. In 603 BLSA participants (mean age=73.5±11 years; 56% women; 69% white), best-corrected and presenting visual acuity (VA), contrast sensitivity, visual fields (VF), stereo acuity were assessed from 2015 to 2019. Free-living PA was assessed using a wrist-worn ActiGraph accelerometer for 7 days. Linear regression models showed that participants with vs. without best-corrected VA impairment had 29.3 fewer active minutes/day (p=0.03) and trended towards fewer activity counts (p=0.05), adjusting for sociodemographic and health characteristics. VF impairment was associated with 268,636 fewer activity counts (p=0.02), 46.2 fewer active minutes/day (p=0.02), and a 3% greater activity fragmentation (p=0.009). Older adults with visual impairment have restricted and more fragmented activity patterns. Longitudinal studies are warranted to examine causality between visual impairment and PA decline.

DETECTING A NOVEL WALKING-BASED PERFORMANCE FATIGABILITY MARKER WITH ACCELEROMETRY IN OLDER ADULTS

Yujia (Susanna) Qiao,[1] Jaroslaw Harezlak,[2] Robert Boudreau,[3] Jacek Urbanek,[4] Kyle Moored,[3] Jennifer Schrack,[5] Eleanor Simonsick,[6] and Nancy W. Glynn,[7] *1. University of Pittsburgh, University of Pittsburgh, Pennsylvania, United States, 2. Indiana University, Bloomington, Indiana, United States, 3. University of Pittsburgh, Pittsburgh, Pennsylvania, United States, 4. Johns Hopkins School of Medicine, Baltimore, Maryland, United States, 5. Johns Hopkins Bloomberg School of Public Health, Baltimore, Maryland, United States, 6. National Instute on Aging/NIH, Baltimore, Maryland, United States, 7. University of Pittsburgh Graduate School of Public Health, Pittsburgh, Pennsylvania, United States*

Walking-based performance fatigability measures (e.g., laptime difference) may not adequately capture performance deterioration as self-pacing is a common compensatory strategy in those with low activity tolerance. To overcome this limitation, we developed a new approach with accelerometry (ActiGraph GT3X+, sampling=80 Hz, non-dominant wrist) during fast-paced 400m-walk (N=57, age=78.7±5.7 years, women=53%). Cadence (steps/second) was estimated using raw accelerometer data (R "ADEPT"). Penalized regression splines (R "mgcv") were used to estimate the individual-level smoothed cadence trajectories. "Time-to-slow-down" was defined as first timepoint where the full confidence interval of change in cadence<0. Five participants were censored at stopping time (not slow-down or complete walk). Median "time-to-slow-down" was 1.86 minutes (IQR=0.98-2.73, range=0.57-6.25). Participants with longer "time-to-slow-down" had slower starting cadence, longer 400m-walk time, and greater perceived fatigability (Pittsburgh Fatigability Scale), p's<0.05 (linear regression). Our preliminary findings revealed that detecting accelerometry-based performance fatigability/deterioration in older adults is feasible and needs to account for initial pace.