and while performing serial-subtractions (i.e., dual tasking). We then established the test-retest reliability of several metrics of postural sway derived from this assessment tool, as well as their sensitivity to the effect of age and standing condition. Fifteen healthy younger and 15 older adults completed multiple standing trials in two separate laboratory visits and on three separate days in their own homes. Postural sway metrics included the mean distance from the center of the trajectory and root mean square were derived from both transverse-plane acceleration and angular velocity time series. Each sway metric demonstrated excellent test-retest reliability, even when analyzed separately by group and standing condition (ICCs: 0.78-0.89). Moreover, each metric was sensitive to age group and standing condition, such that greater sway was observed in older adults as compared to younger adults ($p<0.03$), and in more challenging standing conditions ($p<0.0001$). These results suggest that sensitive metrics of standing postural control may be reliably obtained from remote smartphone-based assessments in both younger and older adults.

AUTOMATIC QUANTIFICATION OF TANDEM WALKING USING A WEARABLE DEVICE: VALIDITY OF THE INSTRUMENTED TANDEM WALK

Jeffrey M. Hausdorff,[1] Natalie Ganz,[1] Eran Gazit,[1] Amit Hadad,[2] Aron S. Buchman,[3] and Anat Mirelman[1], *1. Center for the study of Movement, Cognition and Mobility, Neurological Institute, Tel Aviv Sourasky Medical Center, Israel, Tel Aviv, Israel, 2. Department of Physical Therapy, Sackler Faculty of Medicine, Tel Aviv University, Israel, Tel Aviv, Israel, 3. Rush Alzheimer's Disease Center, Rush University Medical Center, Chicago, USA, Chicago, Illinois, United States*

Tandem walk (TW) is typically assessed by the time to complete the task and the number of missteps, however, these measures suffer from limitations and may not fully capture the range of performance in this task. We developed metrics of TW by using a body-fixed, wearable sensor in young and older adults. Healthy young men (n=40) and older adult men (n=362) were studied. While wearing a 3D accelerometer on their lower back, subjects performed three different tasks: TW, usual-walking, and quiet standing. The extracted measures for TW were: High-to-Low frequency band ratio from the power spectral density from the ML axis [nu], signal vector magnitude[g], step duration[s], sample entropy from ML, AP axis[nu] and CV[%]. All of the TW metrics were significantly different in the young and older men ($p<0.001$). Older men completed the TW with higher CV, suggesting greater stride-to-stride variability and they walked more slowly, as seen by their step duration. Additionally, the frequency ratio measure suggests that the older adults displayed less complex corrective movements in the ML axis. TW measures were modestly correlated with usual-walking (e.g., average stride time with TW step time, $r=0.3$; $p<0.001$) and with quiet standing postural control (e.g., acceleration path length in the ML and AP axis with TW sample entropy in the ML axis, $r=0.13$; $p=0.014$). Metrics derived from a wearable device complement conventional TW measures and vary with age. Further work is needed to determine if TW, gait and posture metrics are differentially associated with distinct adverse health outcomes.

WEARABLES REVEAL A GAP BETWEEN GAIT PERFORMANCE IN THE LAB AND DURING 24/7 MONITORING IN OLDER ADULTS

Inbar Hillel,[1] Laura Avanzino,[2] Andrea Cereatti,[3] Marcel Olde Rikkert,[4] Silvia Del Din,[5] Pieter Ginis,[6] Anat Mirelman,[1] and Jeffrey M. Hausdorff[1], *1. Center for the study of Movement, Cognition and Mobility, Neurological Institute, Tel Aviv Sourasky Medical Center, Israel, Tel Aviv, Israel, 2. IRCCS San Martino Teaching Hospital, Genoa, Italy., Genoa, Italy, 3. Department of Biomedical Sciences, Bioengineering unit, University of Sassari, Italy, Sassari, Italy, 4. Department of Geriatric Medicine, Donders Centre for Medical Neuroscience, Radboudumc Alzheimer Center, Radboud university medical center, Nijmegen, The Netherlands, Nijmegen, Netherlands, 5. Institute of Neuroscience, Newcastle University Institute for Ageing, Clinical Ageing Research Unit, Campus for Ageing and Vitality, Newcastle University, Newcastle upon Tyne, UK, Newcastle upon Tyne, United Kingdom, 6. Neuromotor Rehabilitation Research Group, Department of Rehabilitation Sciences, KU Leuven, Belgium, Leuven, Belgium*

We compared in-lab usual-walking (UW) and dual-task walking (DTW) to daily-living measures of gait obtained during 24/7 monitoring. In-lab gait features (e.g., gait speed, step and stride regularity) derived from UW and DTW were compared to the same gait features during daily-living in 150 elderly fallers (age: 76.5±6.3 years, 37.6% men). Features were extracted from a lower-back accelerometer. In daily-living setting, subjects wore the device for one week and pre-processing detected 30-second walking bouts. A histogram of all walking bouts was determined for each walking feature for each subject, then each subject's typical, worst and best values were determined. Statistics of reliability were assessed using ICC and Bland-Altman. As expected, in-lab gait speed, step regularity, and stride regularity were worse during DTW, compared to UW. Gait speed, step regularity, and stride regularity during UW were significantly higher (i.e., better) from the typical daily-living values ($p<0.0001$) and different ($p<0.000$) from the worst and best values. DTW values tended to be similar to typical daily-living values ($p=0.205$, $p=0.053$, $p=0.013$ respectively). ICC assessment and Bland-Altman plots indicated that in-lab values do not reliably reflect the daily-walking values. Gait values during relatively long daily-living walking bouts are more similar to the corresponding values obtained in the lab during DTW, as compared to UW. Still, gait performance during most daily-living walking bouts are worse than that measured in-lab and do not reliably reflect each other. That is, an older adult's typical daily-living gait cannot be estimated by simply measuring walking in a structured, laboratory setting.

VIDEO RECORDING FOR CAPTURING INTERACTIONS BETWEEN RESIDENTS WITH DEMENTIA AND STAFF: A SYSTEMATIC REVIEW

Da Eun Kim,[1] Hae Sagong,[1] Eunjoo Kim,[1] Ah Ram Jang,[1] and Ju Young Yoon[1], *1. Seoul National University, Seoul, Korea, Republic of*

The use of video-recording offers important advantages in observing and assessing the relationships between specific behaviors in health care settings. The purpose of this