Resulting estimates were cross-evaluated on a separate sample of 16 participants who performed a sub-set of activities in their home. Results: In the laboratory setting, mean differences between measured and predicted MET value for sedentary (0.36), lifestyle (0.02) and locomotor (0.30) activities were low, but the 95% limits of agreement ranges were relatively large (+/-1.0, +/-1.8, +/-3.1, respectively). Data features were 85%, 88%, and 71% accurate for identifying sedentary, lifestyle and locomotor activities. Prediction equations had an overall mean difference of 0.19 METs (95% limits of agreement = -1.3 to 1.7) when activities were performed at home. Conclusion: Data features extracted from a wrist worn tri-axial accelerometer provide a moderate-to-high group estimate of metabolic intensity and had modest accuracy in identifying activity types across a variety of daily activities. However, significant between person variations were evident. Additional work is needed to refine wrist-worn accelerometers for estimating physical activity type, intensity, duration and frequency across the age spectrum.

DETECTION OF FORWARD PROPULSION USING A SINGLE ACCELEROMETER DURING WALKING IN OLDER POPULATION

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In the geriatric population, diminished ankle joint moment and weak plantar flexor can contribute to inadequate forward propulsion and negatively impact gait performance, which can lead to poor energetic efficiency. Detection of propulsion phase can help identify gait normality and guide rehabilitation therapy to improve functional performance. Current methods have limited application in daily life and unsuitable for continuous monitoring. In this study, we aim to develop algorithms based on a single sensor attached to the shin to accurately detect propulsion phase. Six elderly (age: 73 years, BMI: 30.4) were recruited. Participants walked at their normal pace while wearing a plantar pressure system and an accelerometer on the shin. The pressure data was used to define the beginning of the propulsion phase when the pressure switched from the heel to the forefoot. A wavelet algorithm was developed to automatically detect the start and end points of propulsion phase using an accelerometer. The Bland-Altman method was used to evaluate the agreement between these methods. Pearson's Coefficient was used to quantify the correlation. Based on the Bland-Altman analysis, A high agreement was obtained between the proposed method using accelerometer and pressure sensor (bias =9 ms, precision = 30 ms). Both algorithms are significantly correlated ($r = 0.85$, $p<0.05$). This study presents an innovative algorithm to automatically detect the propulsion phase for older adults during walking. Using wearable could facilitate the capture of propulsion phase during living activity, which might provide more insights into the mechanism of walking during rehabilitation therapy.

LONG-TERM GAIT SPEED TELEMONITORING IN OLDER ADULTS WITH MILD COGNITIVE IMPAIRMENT OR MILD DEMENTIA. THE DECI STUDY

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Non-intrusive telemonitoring of physical activity in Older Adults suffering from Mild Cognitive Impairment (MCI), or Mild Dementia (MD), was implemented as part of a 6-month multicomponent digital intervention in the DECI study (EU Horizon2020 grant No 643588). Methods: To estimate gait speed long-term trajectory, a processing algorithm was applied on individual accelerometry data continuously recorded via the ADAMO wrist-watch accelerometer. Speed Trend Analysis was performed if patients wore the device ≥90 days. Only outdoor activity was analyzed to reflect patients' own natural gait speed. Only time spent in high or very-high-activity level is used, to eliminate rest periods (e.g. sitting on a bench, on a bus or driving). A raw mean walking speed was computed. Stride was computed from gender and height and walked distance from stride and step count. Mean walking speed was estimated by walking distance and duration. A rolling mean algorithm was applied to the computed mean 15-day baseline series, resulting in a new series representing normalized patient's gait speed trajectory during the study. Results: Baseline characteristics: F/M=21/19; MCI/MD=36/4; age=75.4±6.0 years; BMI= 24.6±5,2; MMSE=26.5±2.4; education=8.9±4.0 years. Monitoring days=147±29. Overall three main patterns of gait speed trajectory were identified: "relative stability", "improving trend" and "progressive decline": No evident correlation with cognitive status was observed in the sample. Examples of individual patterns are shown. Conclusions: Gait Speed Analysis can describe physical function trajectory over time and identify decliners from stable or improving older adults. Further analyses may clarify the relationship between physical function changes and cognitive status.

AGE- AND ETHNICITY-RELATED DISPARITIES IN TECHNOLOGY USE AMONG HIGH-RISK VETERANS

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Using predictive analytic modelling, the Veterans Affairs has identified Veterans considered to be High Need High Risk (HNHR) requiring increased support. This pilot study sent needs assessment questionnaires to 1112 HNHR Veterans to better understand gaps regarding technology use, access, physical function, and mobility. There were 341(30.7%) respondents: 270(80.4%) Non-Hispanic, 64(18.8%) Hispanic/Latino; 210(61.6%) White, 119(34.9%) Black/African Americans; and 310(90.4%)