

ReadMe file for accelerometry data set from prospective, longitudinal cohort of persons with upper limb paresis post stroke

February 2022, CE Lang

These accelerometry data were collected from 2017-2020 from persons early after stroke. Data collection was stopped in March 2020 with the onset of the COVID 19 pandemic. General criteria for inclusion for enrollment were 1st stroke resulting in unilateral upper limb paresis and expectations for return to home and community living (i.e. not institutionalized). Participants were evaluated at 2, 4, 6, 8, 12, 16, 20, and 24 weeks post stroke to track the trajectory of change in upper limb impairment (Fugl-Meyer Assessment), capacity for activity (Action Research Arm Test), and performance of activity in daily life (variables derived from wearable sensors).

Details of the sample and data collection procedures can be found in:

- Lang CE, Waddell KJ, Barth J, Holleran CL, Strube MJ, Bland MD (2021) Upper limb performance in daily life approaches plateau around three to six weeks post stroke. *Neurorehabilitation and Neural Repair*, 35:903:914.

This paper should be cited in any cases of presentation or publication with the data.

The file, *LongitudinalEarlyStrokeCohortDemographicsEtc_20220201.csv*, is structured in long format, where the columns are the variables and each participant has multiple rows representing the time points. The first row for each participant includes the demographic information (left most column) and a variable "Include record in analysis" (right most column) indicating whether or not that individual was included in the primary results paper listed above. The "Screen" row only contains a SAFE score that was evaluated as close to 48 hrs post stroke as possible. Subsequent rows are for the time points and include the impairment and capacity measures along with the performance variables derived from the accelerometers. One of the columns on the end includes comments related to the accelerometer data collection that were recorded by person doing assessments or processing the data.

Participants wore Actigraph GTX3 accelerometers on both wrists 24 hrs at each time point. Accelerometers were donned after the in-person testing, such that recorded activity came from time outside the clinic or laboratory visit.

Files are stored in folders by participant number. Each participant folder contains folders from the assessment time points. Within each time point are folders for the two upper limbs, "LUE" and "RUE", along with some files. The other files in each time point folder that may or may not be useful. The other files contain output variables and graphs, generated via MATLAB. Within each limb folder, there will be at least four files. Not all participants have all time points.

*.gt3x is the original Actigraph file and needs to be opened with Actigraph software.

*.agd is also an Actigraph file. It is used for visualizing data in the Actigraph software. There may be two *.agd files that were downsampled to different bin widths (e.g. 10 sec).

*RAW.csv is a comma-separated values file of the 30 Hz raw data, with accelerometry values in gravitational units (m/s^2).

*1sec.csv is a comma-separated values file with filtered and resampled data. Using the proprietary ActiLife software, data were bandpass filtered between 0.25 and 2.5 Hz and binned into 1 second epochs, where each second is the sum of the values within that second. Values are in activity counts, defined by the software as 1 activity count = 0.001664 gravitational units (m/s^2).

[Note that this file storage/file naming system is a good example of how not to store data for future sharing. Please direct questions about the data to langc@wustl.edu]

Additional papers published so far using these accelerometry data include:

- Waddell KJ, Strube MJ, Tabak RG, Haire-Joshu D, Lang CE (2019) Upper limb performance in daily life improves over the first 12 weeks post stroke. *Neurorehabilitation and Neural Repair*, 33:836-847.
- Waddell KJ, Tabak RG, Strube MJ, Haire-Joshu D, Lang CE (2019) Belief, confidence, and motivation to use the paretic upper limb in daily life over the first 24 weeks after stroke. *Journal of Neurologic Physical Therapy*, 43:197-203.
- Barth J, Bland MD, Konrad JD, Lohse KR, Lang CE (2021) Sensor-based categorization of upper limb performance in daily life of persons with and without neurological upper limb deficits. *Frontiers in Rehabilitation Sciences, Special Issue on Technology*, Vol 2, doi=10.3389/fresc.2021.741393.