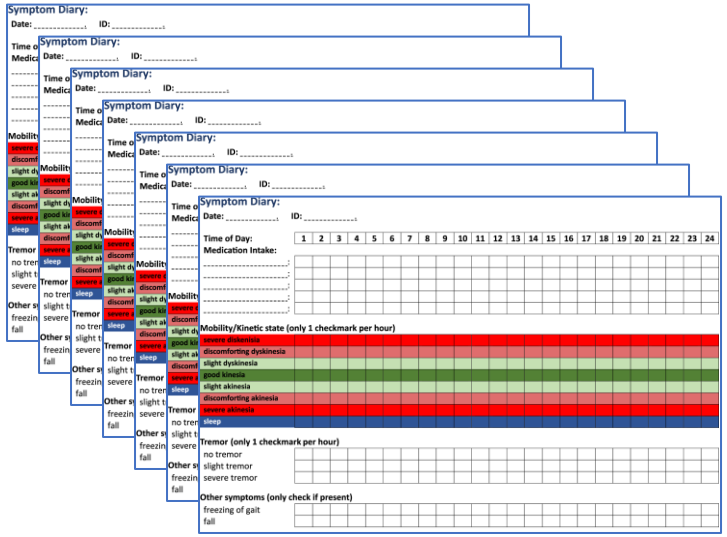
CRC 1451 – Projects C04/C07: Continuous observation of Parkinsonian symptoms using symptom diaries & wearable accelerometry

Motor fluctuations are the key hallmark of later-stage Parkinson's disease (PD) and most advanced therapeutic strategies were specifically designed to address these fluctuations. There is, however, a lack of reliable tools to quantify motor fluctuations: The historic "gold standard" of patient provided "symptom diaries" suffers from severe limitations - especially regarding symptom awareness and adherence - which is why wearable-based tracking of motor fluctuations has been proposed as a superior approach. However, many current commercially available solutions for tracking PD motor fluctuations lack proper clinical validation and pricing models are often prohibitive of widespread adoption – especially in investigator-initiated trials.

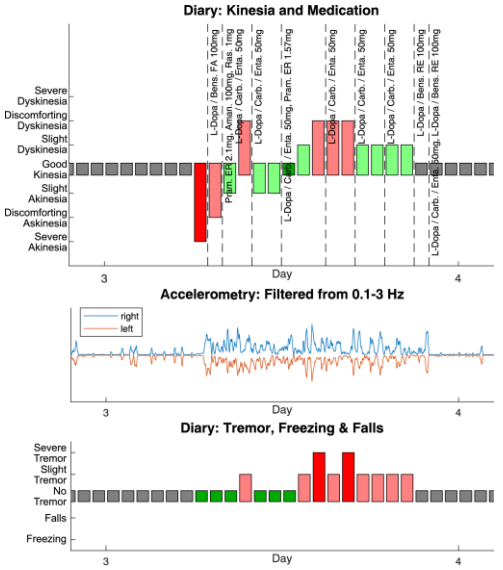
With this project we provide an open-science dataset with simultaneous wearable accelerometry recordings and symptom diaries in n = 66 participants with PD. Participants wore bilateral wristwatch-style 3-axis accelerometers for 7 days while recording their motor state, tremor, freezing and medication intake in an hourly fashion (about 393 days of data in total).

The aim of our open-science approach is to empower other researchers to develop, train, or validate novel approaches for motor fluctuation quantification!

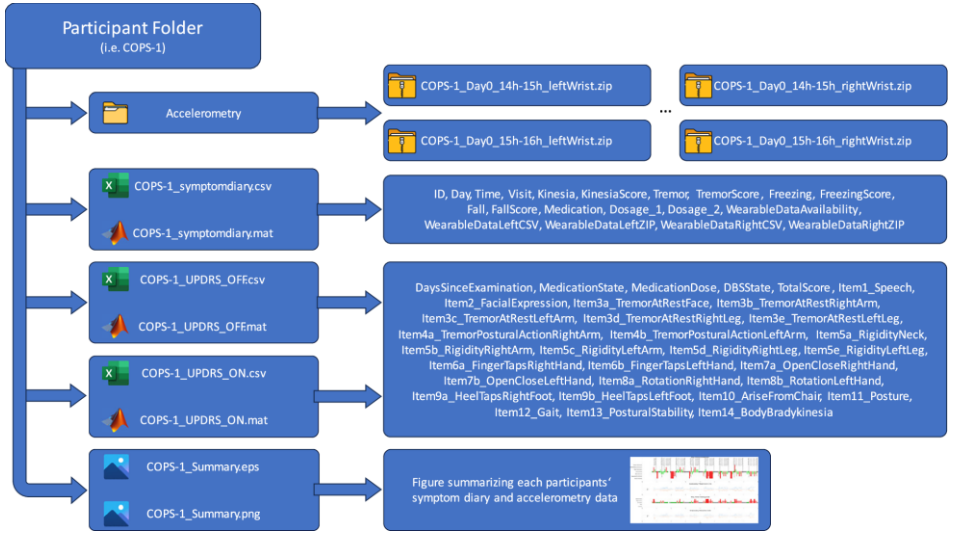


7 days of symptom diaries

7 days of bilateral, raw data, 3-axis accelerometry at 100 Hz



careful data curation



open release of the dataset in full

get the dataset@

OSF

osf.io/5xvwn/

read the descriptor@

scientific data

nature.com/articles/s41597-026-06999-6

Tom Nesser:
Did an awsome job of recruiting participants, conducting the study, and ensuring data quality as part of his medical thesis!

Michael T. Barbe (C04) & Till A. Dembek (C07): Designed the study, provided joint supervision as well as curation and release of the final dataset.