

Walking Periods: Analyzing Daily-Life Walking Behavior in People with Idiopathic and Atypical Parkinsonism

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In Parkinsonism, continuous walking is interrupted by hesitations, freezing, or environmental constraints. These pauses are part of the disease, yet bout-level analysis treats them as boundaries, splitting sustained episodes into several walking bouts (WBs). Bout-derived gait measures in Parkinson's disease (PD), multiple system atrophy (MSA) and progressive supranuclear palsy (PSP) may thus misrepresent daily-life walking.

We analyzed one week of gait monitoring from 73 MobilityAPP participants (35 PD, 20 MSA, 18 PSP). WBs less than 3 seconds apart were merged [1] and WBs less than 60 seconds apart were grouped into Walking Periods (WPs) [2]. WPs were WB clusters (WBC, ≥ 2 WBs) or standalone WBs. Daily distributions of WPs duration, distance and speed were compared across syndromes and correlated with clinical scales within diagnoses.

WBCs were about half of all WPs but carried 84–92% of duration and 82–90% of distance. The variability and upper range of WP metrics differed across syndromes: MSA had the shortest long WPs (P95 distance: 52 m vs 104 m in PD and 94 m in PSP), and speed separated PD from both atypical syndromes. In MSA, WP metrics were associated with clinician-rated severity (CGI-S vs P95 duration, $\rho = -0.78$). In contrast, the number of WPs per day and median WP duration and distance did not differ across syndromes.

These preliminary findings support WPs as a candidate unit for describing daily-life walking in parkinsonism. Whether they add information beyond bout-level metrics, and which grouping threshold suits mobility-impaired populations, remains to be tested in larger samples.

References

1) Kluge F, Del Din S, Cereatti A, et al. Consensus based framework for digital mobility monitoring. PLoS ONE. 2021;16(8):e0256541.

2) Grønvik KB, Berge MA, Tangen GG, Helbostad JL, Skjæret-Maroni N, Vereijken B, Paraschiv-Ionescu A. Patterns of daily-life walking in older adults – the HUNT4 Trondheim 70+ Observational Study. Research Square (preprint, under revision). 2026.

Biosketch

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