# PLENARIES

## PLENARY 8: Function of Gait in Movement Disorders: From Pathophysiology to Real-World Function

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Gait is a complex functional behaviour extending beyond the ability to walk and reflecting the interaction of motor, cognitive, sensory, neurological, and environmental factors. In movement disorders, gait dysfunction arises from diverse pathophysiological mechanisms and manifests through distinct gait phenotypes, affecting mobility, independence, activity, and participation. Understanding these relationships is fundamental to accurate assessment, clinical reasoning, and targeted rehabilitation.

Parkinson's disease (PD) provides a prominent example of mechanism-driven gait dysfunction, in which nigrostriatal dysfunction and impaired automaticity contribute to reduced step length, bradykinetic gait, reduced gait speed, freezing of gait, festination, turning difficulty, postural instability, and falls. Comprehensive gait assessment therefore requires more than a single clinical measure and should incorporate standardised clinical tests, instrumented or laboratory-based analysis, dual-task performance, turning, adaptability, and real-world mobility. A framework encompassing capacity, performance, adaptability, cognitive-motor function, and participation provides a multidimensional approach to characterising functional gait.

Gait dysfunction in other movement disorders, including cerebellar ataxia and higher-order or functional gait disorders, requires mechanism-specific assessment and intervention. Rehabilitation approaches may incorporate gait-specific training, aerobic and resistance exercise, balance and motor-cognitive training, external cueing, environmental modification, and meaningful community-based practice.

Effective gait rehabilitation requires clinicians to identify the underlying mechanisms of dysfunction, evaluate gait across relevant contexts, and integrate objective findings with patient-centred goals. Ultimately, meaningful rehabilitation outcomes extend beyond improvements in gait parameters to include safer mobility, greater independence, enhanced community participation, and improved performance of everyday activities.