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Jaslok Hospital launches clinical study to enable AI-based prediction of Parkinsonâ??s freezing episodes

12 April 2026 | News

System will analyse routine walking videos using computer vision and machine learning



Jaslok Hospital & Research Centre, Mumbai, has launched a pioneering artificial intelligence (AI) project aimed at predicting Freezing of Gait (FOG) in Parkinson's disease.

Patients often experience a sudden inability to initiate or continue walking, describing the sensation as if their feet are "glued to the floor." This leads to frequent falls, injuries, progressive loss of independence and a significant caregiver burden, affecting up to 80% of patients with advanced Parkinson's disease. Despite this high prevalence and impact, no definitive treatment is currently available.

Although emerging research suggests that structured motor and cognitive training may delay onset, clinical practice still lacks reliable tools to identify individuals at risk or to determine when the condition may emerge. Most existing predictive approaches rely on clinical scoring systems, imaging biomarkers or biochemical tests, which are often expensive, resource-intensive and largely confined to specialised research settings. Besides none of the tool can definitely predict at individual level if one would develop freezing of gait in the course of disease.

The proposed AI-based system under this collaboration addresses this gap by introducing a dual approach that estimates both the likelihood of FOG and its probable time to FOG, enabling earlier clinical intervention and more targeted preventive planning.

The unique aspect of time to FOG is being explored for the first time. This has been possible due availability of longitudinal clinical and video data over 25 years of more than 750 patients who have undergone DBS surgery at Jaslok Hospital and Research Centre. The system is designed around a simple yet highly scalable framework that analyses routine video recordings of a patient's walking pattern. It will use computer vision and machine learning techniques to identify subtle changes in gait and body coordination that may signal early vulnerability to freezing episodes.

Since the approach does not rely on specialised wearable devices or high-cost diagnostic infrastructure, it is intended for deployment across hospitals, outpatient clinics and telemedicine platforms, including resource-limited settings.

To ensure clinical robustness, the research has been structured in two distinct phases. The first phase focuses on model development using retrospective clinical data and video recordings from more than 150 Parkinson's patients who developed Freezing of Gait during long-term follow-up. The second phase will validate the model prospectively in a cohort of 337 patients followed over a period of up to three years.

The long-term objective of this initiative is to develop an open-access and user-friendly AI application that enables clinicians to identify at-risk patients early, estimate likely onset timelines, introduce preventive interventions at the right stage, and ultimately reduce falls, disability and overall disease burden while improving quality of life for patients and caregivers.