

# Global Kinetics' Personal KinetiGraph Identifies Parkinson's Patients Suitable For Deep Brain Stimulation

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## Executive Summary

A new study shows the Personal KinetiGraph wearable monitor can help clinicians identify the Parkinson's disease patients most likely to benefit from device-assisted therapies, including deep brain stimulation.



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Global Kinetics' Personal KinetiGraph (PKG) wearable sensor system can identify the best candidates for device-assisted therapies for Parkinson's disease, including deep brain stimulation, more efficiently than clinical assessment alone, according to new study results.

Personal KinetiGraph looks like a wristwatch, but it contains an accelerometer that provides continuous objective measurement of Parkinson's patients' bradykinesia and dyskinesia. It earned a 510(k) in 2014 and is CE-marked. (Also see "Global Kinetics Brings In Big Investments In Parkinson's Tracker" - Medtech Insight, 26 Apr, 2018.)

Hamid Khodakarami of Global Kinetics and researchers in Melbourne, Australia, used data collected by the Personal KinetiGraph to create the first objective decision tool to help identify the Parkinson's patients most likely to benefit from device-assisted therapies. Using data generated by the patients' PKGs, the researchers

created a device-assisted therapy (DAT) classifier score. An explanation of the developed research tool and the results of a 172-patient study validating it are now published in the journal *Sensors*.

The study showed that the DAT score identifies Parkinson's disease patients that are suffering excessive periods of bradykinesia and/or dyskinesia. It also showed that when symptoms changed after patients took different oral medications, the outcome was reflected in their DAT scores.



Global Kinetics Corp.

GLOBAL KINETICS' PERSONAL KINETIGRAPH

The current standard of care for assessing a Parkinson's patient's suitability for device-assisted therapy is a thorough clinical evaluation by a specialist. In this study, the DAT classifier score was able to predict, with high specificity and sensitivity, which patients would be referred for device-assisted therapy based on an expert's clinical evaluation, so the authors believe it could eventually be a substitute for expert clinical evaluation in identifying which patients are suitable for device-assisted therapy.

"A central reason for this study was to produce a screening tool to aid the non-specialist in making timely referrals for device-assisted therapy, without

burdening these centers with too many unsuitable cases," Khodakarami and researchers wrote about the study's results. "This study suggests that information from objective measurement could improve timely referral for device-assisted therapy."

Fatta Nahab, a neurologist at the University of California, San Diego specializing in movement disorders, told *Medtech Insight*, "Most patients with Parkinson's are managed by a general neurologist or somebody who is not typically a specialist or expert in managing Parkinson's, whereas the specialists are usually the ones who determine whether somebody is a good candidate for a device-assisted therapy such as deep-brain stimulation. So that creates a little bit of a disconnect." (Also see "Market Intel: NANS 2018: Positive Data Intensifies Spinal-Cord Stim's Big-Four Rivalry" - Medtech Insight, 5 Feb, 2018.)

Nahab said patients are often referred to specialists for device-assisted therapy after it's too late for that therapy to be a viable option.

"They've had Parkinson's for way too long and by the time they arrive, they're not a good surgical candidate or there may be other factors that basically disqualify them for surgery," he explained. About 20% of Parkinson's patients may benefit from deep-brain stimulation, but only about 1% are currently treated with it, "so there are a lot of people not being referred at the right times and it is overwhelming for the specialist centers to be able to handle everybody and screen everybody."

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Nahab believes the PKG and the DAT score could become a widely used screening tool to identify the best candidates for deep-brain stimulation surgery.

This strategy would improve clinical outcomes and reduce long-term complications for the patients treated with deep-brain stimulation, and it would reduce overall costs for the health system by reducing the number of people who are referred to the specialist centers despite being poor candidates for deep-brain stimulation.

“Where we are still limited is being able to translate those numbers into actionable information,” Nahab said. He said the next step in the development of the objective evaluation of Parkinson’s disease is to complete clinical trials showing that treatment based on specific numerical targets can improve patient outcomes.

In 2018, the company received funding from The Michael J. Fox Foundation for Parkinson’s Research, Shake It Up Australia Foundation and Parkinson’s Victoria to support the global Treat-to-Target trial, a randomized controlled trial of PKG designed to establish target ranges that can guide treatment of Parkinson’s disease. Global Kinetics is also sponsoring the APPRISE randomized trial comparing treatment guided by PKG to treatment led by standard-of-care clinical evaluation. (Also see “Global Kinetics Kicks Off US Parkinson’s Outcomes Trial For Wearable Monitor” - Medtech Insight, 10 Jul, 2017.)

“If that shows [the PKG-guided approach is] the more effective way forward, then we [will be] transitioning the care of Parkinson’s from an era of ‘eye-balling’ patients to now using targets similar to what is done in diabetes or heart disease,” Nahab said.