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# Groundbreaking study published in the Journal of the American Medical Association (JAMA) Neurology demonstrates effectiveness of Medtronic BrainSense™ Adaptive deep brain stimulation for people with Parkinson's

The pivotal Medtronic Adaptive DBS Algorithm for Personalized Therapy in Parkinson's Disease (ADAPT-PD) trial demonstrates global clinical effectiveness, long-term safety, and patient preference

Medtronic, a global leader in healthcare technology, announced the results from the Medtronic Adaptive DBS Algorithm for Personalized Therapy in Parkinson's Disease (ADAPT-PD) trial<sup>1</sup> now published in the distinguished [Journal of the American Medical Association \(JAMA\) Neurology](#)<sup>2</sup>. The pivotal trial is the first to evaluate the chronic use of BrainSense™ Adaptive deep brain stimulation (aDBS) for people with Parkinson's disease.

The study publication follows the recent U.S. [Food and Drug Administration](#) (FDA) and European [CE Mark](#) approvals of BrainSense™ Adaptive deep brain stimulation (aDBS) for people with Parkinson's. BrainSense™ aDBS is the world's first closed-loop DBS system for people with Parkinson's. This exclusive [technology](#) within the Medtronic Percept™ neurostimulator continuously adapts to a patient's unique brain activity—in real time—allowing for a personalized and effective therapy throughout the day and night.

While Parkinson's and other movement disorders remain incurable, deep brain stimulation (DBS) has provided transformative relief for patients for more than 30 years. Described as a pacemaker but for the brain, DBS involves a minimally invasive surgical procedure to implant a neurostimulator that delivers targeted electrical impulses to specific areas of the brain, helping to manage symptoms and restore control in daily life. Traditional cDBS systems have been shown to improve motor symptoms in people with Parkinson's disease,<sup>3,4</sup> but cannot adapt in real time to fluctuations in Parkinson's symptoms. The ADAPT-PD trial was designed to evaluate the safety and efficacy of aDBS compared to cDBS, with secondary assessments including energy use and patient preference.

As the largest and longest study of its kind, the ADAPT-PD trial underscores the potential of [BrainSense™ Adaptive](#)

[deep brain stimulation](#) (aDBS) in clinical practice as it established efficacy in patients who were previously receiving stable cDBS and medication for Parkinson's symptom control. It is also the first trial to compare two distinct aDBS modes and evaluate long-term, at-home use of closed-loop DBS in a multicenter setting. Findings show that aDBS is safe, well tolerated, and can provide an effective therapy compared to continuous DBS (cDBS).<sup>2</sup>

"This publication marks another milestone for the Parkinson's community and field of neuromodulation," said Scott Stanslaski, Medtronic Senior Distinguished Engineer and one of the inventors of BrainSense™ technology. "We've known that adaptive deep brain stimulation holds the potential to personalize care in powerful new ways—this study now offers compelling clinical evidence to reinforce what we've seen in real-world use. These results validate over a decade of development, collaboration with internal and external experts in Parkinson's disease, and perseverance, while strengthening our confidence in aDBS as the next evolution of therapy for people with Parkinson's."

The ADAPT-PD trial evaluated two aDBS algorithms: single threshold mode and dual threshold mode<sup>5</sup> in 45 patients for 30 days (participants were evaluated in one or both modes depending on their clinical response to each mode) and 40 patients received aDBS for more than one year. The ADAPT-PD trial met its primary efficacy endpoint, with most patients experiencing comparable "On" time without troublesome dyskinesia during aDBS vs cDBS<sup>2</sup>.

In an unblinded comparison of aDBS to their clinical cDBS, participants reported on average more on time (time with good motor control) and less off time (time feeling undertreated) on aDBS compared to cDBS, which became clinically meaningful on dual threshold aDBS (+1.3 hours for on time and -1.6 hours for off time). After the 30-day evaluation of aDBS, nearly all participants chose to continue with aDBS instead of returning to their prior cDBS settings (98%, 44/45). Total electrical energy delivered (TEED) was reduced, on average, compared to cDBS.

"Living with Parkinson's for years, I never imagined I'd feel this level of freedom again," said Deb, a patient participant in the ADAPT-PD clinical trial at the University of California, San Francisco. "I stopped thinking about my disease every minute of the day. When I became one of the first in the U.S. to be programmed with the commercial technology, it was an emotional moment, not just because of how far I had come, but because I knew others could finally experience the same."

The Medtronic ADAPT-PD trial was conducted globally in collaboration with leading neurologists and neurosurgeons. It is the largest and longest clinical trial assessment of closed-loop neuromodulation in Parkinson's disease to date. The trial enrolled participants across 10 centers in the United States, Canada, and Europe, including:

- Amsterdam University Medical Centers (the Netherlands)
- Centre Hospitalier Universitaire de Grenoble (France)
- Cleveland Clinic (USA)
- Duke University Medical Center (USA)
- Massachusetts General Hospital (USA)
- Stanford University School of Medicine (USA)
- University of California San Francisco Medical Center (USA)
- University of Florida Health Shands Hospital (USA)

- Toronto Western Hospital (Canada)
- Vanderbilt University Medical Center (USA)

**“The ADAPT-PD trial is a major advancement in managing the day-to-day realities of Parkinson’s disease,”** said Helen Bronte-Stewart, MD, MSE, FAAN, FANA, John E. Cahill Family Professor in the Department of Neurology and Neurological Sciences and director of the Human Motor Control and Neuromodulation Lab at Stanford University School of Medicine, and global principal investigator of the Medtronic ADAPT-PD trial. **“This progress was made possible through close collaboration with Medtronic, demonstrating the vital role of public-private partnerships in driving innovation that directly benefits patients.”**

“This innovation represents a huge milestone for Parkinson’s patients that started with key collaborations with leading global experts in Parkinson’s disease, leveraging our exclusive BrainSense™ technology† to develop a complete, sensing-enabled DBS system to detect, capture, and classify different brain signals,” said Stanslaski. This development also puts Medtronic at the forefront of incorporating therapeutic brain-computer interface (BCI) technology into DBS therapy with the purpose of making advances in prevention, detection, diagnosis, rehabilitation, and restoration for patients with complex neurological conditions.”

Since 1987, Medtronic has served more than 200,000 people with movement disorders and other indications in more than 70 countries with its life-changing DBS therapy<sup>6</sup>.

Patients considering DBS therapy should discuss treatment options with their healthcare provider. To learn more about Medtronic DBS with BrainSense™ technology, visit our [website](#).

### **About Medtronic**

Bold thinking. Bolder actions. We are Medtronic. Medtronic plc, headquartered in Galway, Ireland, is the leading global healthcare technology company that boldly attacks the most challenging health problems facing humanity by searching out and finding solutions. Our Mission – to alleviate pain, restore health, and extend life – unites a global team of 95,000+ passionate people across more than 150 countries. Our technologies and therapies treat 70 health conditions and include cardiac devices, surgical robotics, insulin pumps, surgical tools, patient monitoring systems, and more. Powered by our diverse knowledge, insatiable curiosity, and desire to help all those who need it, we deliver innovative technologies that transform the lives of two people every second, every hour, every day. Expect more from us as we empower insight-driven care, experiences that put people first, and better outcomes for our world. In everything we do, we are engineering the extraordinary. For more information on Medtronic, visit [www.Medtronic.com](http://www.Medtronic.com) and follow Medtronic on [LinkedIn](#).

**Any forward-looking statements are subject to risks and uncertainties such as those described in Medtronic's periodic reports on file with the Securities and Exchange Commission. Actual results may differ materially from anticipated results.**

†The sensing feature of the Percept™ PC and Percept™ RC system is intended for use in patients receiving DBS where chronically recorded bioelectric data may provide useful, objective information regarding patient clinical status.

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## References

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<https://news.medtronic.com/Groundbreaking-study-published-in-the-Journal-of-the-American-Medical-Association-JAMA-Neurology-demonstrates-effectiveness-of-Medtronic-BrainSense-TM-Adaptive-deep-brain-stimulation-for-people-with-Parkinsons>