

Short pulse deep brain stimulation

Short pulse [deep brain stimulation](#) (spDBS) increases the therapeutic window in [Parkinson's disease](#) PD patients, yet the effect on [gait](#) and postural symptoms remain unknown.

Seger et al. from the [University Medical Center Hamburg](#) assessed the [efficacy](#) of spDBS compared to conventional DBS (cDBS) within the [subthalamic nucleus](#) (STN) on [Parkinsonian gait](#).

The [study](#) was a [single-center](#), [randomized](#), [double-blind](#), clinical short-term trial. 20 PD patients were studied postoperatively in three different conditions (DBS stimulation switched off (off DBS), spDBS with 40µs pulse width, cDBS with 60µs pulse width) on regular medication. The primary endpoint was the relative difference of gait velocity at self-paced speed during quantitative gait analysis between stimulation conditions. Secondary endpoints were changes of further measures of quantitative gait analysis, Ziegler course, Berg balance scale, FOG questionnaire, MDS-UPDRS, PDQ-39, and HADS. Mixed-model analysis and post-hoc t-tests were performed.

Both spDBS and cDBS improved gait velocity at self-paced speed compared to off DBS, however, there was no significant difference between both stimulation modes. Still, nearly half of the patients preferred spDBS over cDBS subjectively. Both stimulation modes were equally effective in improving secondary endpoints of gait, balance, motor and non-motor performances.

The use of spDBS and cDBS is equally effective in improving [gait](#) and [balance](#) in PD and might be beneficial in specified cohorts of PD patients ¹⁾.

Dayal et al. compared the effect of short pulse width (PW) settings using 30-µs with conventional 60-µs settings on stimulation-induced dysarthria in Parkinson's disease patients with previously implanted STN-DBS systems.

Methods: In this single-center, double-blind, randomized crossover trial, we assigned 16 Parkinson's disease patients who had been on STN-DBS for a mean of 6.5 years and exhibited moderate dysarthria to 30-µs or 60-µs settings for 4 weeks followed by the alternative PW setting for a further 4 weeks. The primary outcome was difference in dysarthric speech measured by the Sentence Intelligibility Test between study baseline and the 2 PW conditions. Secondary outcomes included motor, nonmotor, and quality of life measures.

Results: There was no difference in the Sentence Intelligibility Test scores between baseline and the 2 treatment conditions ($P = 0.25$). There were also no differences noted in motor, nonmotor, or quality of life scores. The 30-µs settings were well tolerated, and adverse event rates were similar to those at conventional PW settings. Post hoc analysis indicated that patients with dysarthria and a shorter duration of DBS may be improved by short PW stimulation.

Conclusions: Short PW settings using 30 µs did not alter dysarthric speech in chronic STN-DBS patients. A future study should evaluate whether patients with shorter duration of DBS may be helped by short PW settings ²⁾.

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Seger A, Gulberti A, Vettorazzi E, Braa H, Buhmann C, Gerloff C, Hamel W, Moll CKE, Pötter-Nerger M. [Short Pulse](#) and Conventional Deep Brain Stimulation Equally Improve the [Parkinsonian Gait](#) Disorder. J Parkinsons Dis. 2021 May 28. doi: 10.3233/JPD-202492. Epub ahead of print. PMID: 34057096.

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Dayal V, Grover T, Tripoliti E, Milabo C, Salazar M, Candelario-McKeown J, Athauda D, Zrinzo L, Akram H, Hariz M, Limousin P, Foltynie T. Short Versus Conventional Pulse-Width Deep Brain Stimulation in Parkinson's Disease: A Randomized Crossover Comparison. *Mov Disord*. 2020 Jan;35(1):101-108. doi: 10.1002/mds.27863. Epub 2019 Sep 30. PMID: 31571270.

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Last update: **2025/04/29 20:24**

