

DD SIG Episode 43: Gait Training in PD with Mike Lewek and CJ Duppen

In this episode, host Parm Padgett talks with Mike Lewek and CJ Duppen from the University of North Carolina at Chapel Hill about using implicit and explicit motor learning techniques with people with Parkinson Disease. CJ and Mike do a deep dive into their research on the integration of targeted rhythmic auditory cueing to improve step length and gait speed. Additionally, they discuss their current work looking at the effects of cueing on gait initiation, step length and step speed, and weight shifting for better anticipatory postural adjustments, all aimed at positively impacting PD symptom progression and mitigating fall risk.

The Degenerative Diseases Special Interest Group is part of the Academy of Neurologic Physical Therapy – www.neuroPT.org

Guest Information

Mike Lewek, PT, Ph.D.

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Chelsea “CJ” Duppen, PT, DPT

Ph.D. Candidate, Human Movement Science Curriculum Ph.D. Program

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4 Key Moments:

6:42 – CJ discusses why the “conventional wisdom” that patients with PD don’t respond to implicit motor learning is not entirely accurate. She discusses the two distinct implicit motor learning pathways present in the hippocampus (rapid encoding) and the striatum (proceduralization), and how motor learning occurs on a continuum.

10:31 – Parm asks about implicit motor learning techniques for gait training in PD; CJ discusses their recently published research; and Mike discusses using targeted rhythmic auditory cueing in gait training to increase step length and gait speed.

15:51 – Parm asks about how to set up treadmill training with targeted rhythmic auditory cueing; Mike discusses how to implement training in the clinic and the dual goals of gait and aerobic training.

22:19 – CJ discusses additional research being conducted in the lab on gait initiation deficits and how improved weight shifting impacts anticipatory postural adjustments (APAs), and first step length and speed, all factors that contribute to falls risk in those with PD.

Referenced articles

Duppen CP, Wrona H, Dayan E, Lewek MD. Evidence of Implicit and Explicit Motor Learning during Gait Training with Distorted Rhythmic Auditory Cues. *J Mot Behav*. 2023 Jul 2:1-10. doi: 10.1080/00222895.2023.2231874. Epub ahead of print. PMID: 37394515.

Related articles

Hoppe M, Chawla G, Browner N, Lewek MD. The effects of metronome frequency differentially affects gait on a treadmill and overground in people with Parkinson disease. *Gait Posture*. 2020 Jun;79:41-45. doi: 10.1016/j.gaitpost.2020.04.003. Epub 2020 Apr 18. PMID: 32344358.

Sherron MA, Stevenson SA, Browner NM, Lewek MD. Targeted Rhythmic Auditory Cueing During Treadmill and Overground Gait for Individuals With Parkinson Disease: A Case Series. *J Neurol Phys Ther*. 2020 Oct;44(4):268-274. doi: 10.1097/NPT.0000000000000315. PMID: 32459723.

Chawla G, Hoppe M, Browner N, Lewek MD. Individuals With Parkinson's Disease Retain Spatiotemporal Gait Control With Music and Metronome Cues. *Motor Control*. 2020 Oct 19;25(1):33-43. doi: 10.1123/mc.2020-0038. PMID: 33075748.