

University of Massachusetts Medical School

eScholarship@UMMS

UMass Center for Clinical and Translational
Science Research Retreat

2014 UMass Center for Clinical and
Translational Science Research Retreat

May 20th, 12:30 PM

Postural Stability is Reduced in People with Multiple Sclerosis due to Walking-imposed Fatigue

Stephanie L. Jones

University of Massachusetts Amherst

Et al.

Let us know how access to this document benefits you.

Follow this and additional works at: https://escholarship.umassmed.edu/cts_retreat



Part of the [Biomechanics Commons](#), [Musculoskeletal Diseases Commons](#), and the [Translational Medical Research Commons](#)

Jones SL, Busa MA, Averill JL, van Emmerik RE. (2014). Postural Stability is Reduced in People with Multiple Sclerosis due to Walking-imposed Fatigue. UMass Center for Clinical and Translational Science Research Retreat. Retrieved from https://escholarship.umassmed.edu/cts_retreat/2014/posters/52

Creative Commons License



This work is licensed under a [Creative Commons Attribution-NonCommercial-Share Alike 3.0 License](#).

This material is brought to you by eScholarship@UMMS. It has been accepted for inclusion in UMass Center for Clinical and Translational Science Research Retreat by an authorized administrator of eScholarship@UMMS. For more information, please contact Lisa.Palmer@umassmed.edu.

Postural stability is reduced in people with Multiple Sclerosis due to walking-imposed fatigue

Stephanie L Jones, Michael A Busa, Julianna L Averill, Richard E A van Emmerik

Motor Control Laboratory, Department of Kinesiology, University of Massachusetts
30 Eastman Lane, Amherst, Massachusetts, USA 01003
sljones@kin.umass.edu, mbusa@kin.umass.edu, javerill@kin.umass.edu,
rvanemmerik@kin.umass.edu

The most limiting symptoms reported by individuals with multiple sclerosis (MS) are impaired balance and symptomatic fatigue. We have reported greater postural sway and reduced stability following local muscular fatigue in individuals with MS, suggesting that these symptoms may be related. However, it is unknown whether a similar relationship exists with modest increases in fatigue resulting from an activity of daily living (ADL). Thus, the purpose of this study was to determine whether walking has a greater impact on balance during postural tasks in people with MS (PwMS) compared to those without. Seven PwMS (43±12 yrs, 6F/1M) and 10 controls (CON; 42±12 yrs, 7F/3M) performed postural tasks (quiet stance, fixed/maximal reaches) pre/post 30 minutes of treadmill walking at a range of speeds (0.6-1.4 m/s). Individuals rated their fatigue pre/post walking using a Visual Analog Scale. Kinematic data were recorded using a passive marker system (Qualysis AB) and kinetic data were recorded using two forceplates (AMTI), one under each foot. The net center of pressure was analysed using a time to contact analysis to assess postural stability. Following prolonged walking PwMS demonstrated greater reductions in stability than the CON group during the most challenging task ($P=0.04$), that may be related to increased fatigue ($P<0.0001$) following walking. PwMS demonstrated greater stability than the CON group for maximal reaches (backward, $P=0.009$; forward, $P=0.03$ frontal plane only), which may be explained by reduced reach distances performed by the PwMS (backward, $P=0.2$; forward, $P=0.008$). These findings suggest that PwMS place a higher priority on stability, than maximal reach distance, which could relate to fall-related fear or specific disease-related limitations. These findings indicate that postural stability is reduced in PwMS following a common ADL, thus individuals with MS should be counseled on the increased likelihood of balance loss with heightened fatigue, even at relatively low levels.