

DOES LESION LOCATION IMPACT RESPONSE TO  
FUNCTIONAL INTERMUSCULAR REDUCTION IN SPASTICITY IN MS?

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**Introduction:** Multiple Sclerosis (MS) is a progressive neurological central nervous system condition that causes a variety of impairments, including decreases in strength, and increases in spasticity. Impairments lead to both fatigue and functional loss, the most significant being the ability to walk. MS interferes with a patient's ability to participate fully in vocation, society, and independent living. Whether the lesions are located in the brainstem or cerebellum, as opposed to the cerebral cortex, may affect the response to physical therapy intervention.

**Purpose Statement:** The aim of this pilot study is to determine if lesion location affects participant response to receiving the same physical therapy intervention, as measured by gait speed and gait endurance.

**Methods:** Using a repeated measure, pre-post experimental design, we implemented a combination of intermuscular and functional electrical stimulation with supported treadmill training on a group of nine patients with MS. A neurologist confirmed the location of each participant's lesion using magnetic resonance imaging. We used the 25-foot walk test to measure gait speed and the six-minute walk test to measure gait endurance both pre and post intervention. We utilized General Estimating Equation analysis to measure changes over time.

**Results:** Our preliminary results in 9/16 participants indicate that there was a significant decrease in the 25-foot walk test scores (mean decrease in time to walk 25 feet=1.2 seconds,  $p=0.0002$ ) and an increase in the six-minute walk test scores (mean improvement in distance=39.4 meters,  $p=0.0003$ ). We did not, however, observe a group difference in gait speed (mean difference=0.1 seconds,  $p=0.6974$ ) or gait endurance (mean difference=20.2 meters,  $p=0.2491$ ).

**Conclusion:** Preliminary results of this study demonstrate that after intervention, while all participants with MS improved in gait speed and gait endurance, there was no difference based on lesion location. While these preliminary results suggest lesion location does not impact patient progress, we plan to continue data analysis on our second group of eight patients. Additional clinical trials are needed to confirm these preliminary results.

**Relevance to Allied Health:** This topic is relevant to allied health professionals because a wide variety of disciplines become involved in the care of patients with MS. The results of this study have potential impact on the field of nutritional sciences, as well as speech/language pathology, both heavily involved in intervention for individuals with MS. Additionally, MRI studies are vital to localizing lesions in this population of patients.