(S87) THE MEASUREMENT OF UPPER-EXTREMITY LEARNED NONUSE IN MULTIPLE SCLEROSIS

V.W. Mark,1 E. Taub,2 G.C. Cutter,3 K. Bashir,4 G. Uswatte,2 M.H. Bowman,2 S. McKay2

1Physical Medicine and Rehabilitation, University of Alabama at Birmingham, Birmingham, AL; 2Psychology, University of Alabama at Birmingham, Birmingham, AL; 3Biostatistics, University of Alabama at Birmingham, Birmingham, AL; 4Neurology, University of Alabama at Birmingham, Birmingham, AL

Background: Multiple sclerosis (MS) commonly leads to reduced limb use in the real world despite retained movement ability. Reduced limb use may be conditioned by prolonged difficulty with limb movement and compensation by either another part of the body, an assistive device, or the help of a separate individual to conduct real-world tasks. The reduced limb use appears to involve a conditioned inhibition and can be termed “learned nonuse” (LNU). Nonuse has often been described for the lower extremities in MS but not for the upper extremities (UEs), perhaps because it has not formally been assessed. Learned nonuse in other neurologic disorders (eg, stroke, cerebral palsy) can be counteracted by a specific form of rehabilitation termed Constraint-Induced Movement therapy (CI therapy). Measuring UE nonuse in MS could benefit rehabilitation as well. Objectives: 1) To determine the test-retest reliability in hemiparetic MS of a measure of spontaneous use of the more impaired arm, the Motor Activity Log (MAL). 2) To quantify UE nonuse in hemiparetic MS based on comparison of laboratory measures of maximal movement ability and spontaneous use of the more impaired UE. Methods: 1) Ten individuals with hemiparetic progressive MS who reported intact ability to pick up small objects with the paretic hand but reduced spontaneous use of that hand were tested on the MAL on two occasions 1 week apart. 2) Nine of these individuals were evaluated in the laboratory on the Wolf Motor Function Test (WMFT) to quantify maximal movement ability of the paretic UE and on the MAL. The LNU index was calculated based on the difference between the WMFT and the MAL. Results: 1) The MAL had high test-retest reliability (intraclass correlation coefficient, 0.85). 2) All nine individuals who were tested on both the WMFT and the MAL had a positive LNU index, indicating greater movement ability of the paretic UE in the laboratory than its spontaneous use in the real-world setting. Conclusions: 1) The MAL, which can be used in the assessment of LNU, has high inter-rater reliability in MS. 2) The clinical impression of UE LNU in hemiparetic progressive MS can be confirmed and quantified with measures in the laboratory. These findings may help to advance rehabilitation research trials in MS to improve spontaneous UE use in the real-world setting.

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