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Title: Mechanisms of Imbalance and Falls in Multiple Sclerosis

MESH TERMS: multiple sclerosis, accidental falls, postural balance

Objectives: To determine the mechanisms underlying imbalance and falls, validate a clinical measure of balance mechanisms, and assess how imbalance and falls change over time in people with multiple sclerosis (MS).

Background: People with MS are known to have poor balance and fall frequently but the mechanisms underlying imbalance and falls in MS, how best to measure imbalance and falls in people with MS, and how imbalance and falls change over time in people with MS are not known.

Plan: We will examine balance, balance control mechanisms, falls and falls prevention strategies in people with MS over a 2 year period.

Methods: 58 ambulatory subjects with MS will complete 3 visits 12 months apart over a 24 month period. During each visit all subjects will complete the following: 6 questionnaires - 1. Activities-specific Balance Confidence (ABC) questionnaire to determine subjective imbalance and balance confidence; 2. Multiple Sclerosis Walking Scale (MSWS-12) to determine subjects' walking limitations; 3. Falls Efficacy Scale-International (FES-I) questionnaire to determine subjective concern about the possibility of falling; 4. Falls Prevention Strategy Survey (FPSS) to determine subjective use of strategies to prevent falls; 5. Retrospective falls questionnaire to determine retrospectively the number of falls over the previous year; and 6. Modified Fatigue Impact Scale (MFIS) to determine how fatigue affects a person; have their balance control mechanisms tested using computerized dynamic posturography (CDP), the clinical mini-Balance Evaluation Systems Test (mini-BESTest), and the Physiological Profile Assessment (PPA); and, undergo clinical examination to assess the severity of their MS. In addition, for the 6 months after the first visit all subjects will complete a daily diary with a count of their falls and near falls.

Relationships between CDP measures and the ABC and FES-I will be evaluated to determine the primary mechanisms underlying imbalance in people with MS. Relationships between mini-BESTest, PPA performance and CDP and the number of falls will be evaluated to validate the BESTest. Changes in all measures over the 2 year period will be evaluated to determine how imbalance and falls change over time in people with MS. Relationships between retrospectively and prospectively counted falls, and between falls, balance and falls prevention strategies will also be examined.

Findings to date: None.

Relevance to the VA: The VA provides care to 16,000 Veterans with MS per year, about 6,000 of whom are service connected for MS. Currently the VA spends $274 million dollars per year treating Veterans with MS at an average cost per patient per year of $19,875. Many of these veterans have poor balance and fall frequently, significantly affecting their quality of life and costs of care. This research will provide information that will help identify risk factors for falls and imbalance in veterans with MS and that will help identify interventions that may help to reduce imbalance and prevent falls in veterans with MS.