starting point for the involvement of multiple MS units nationwide in offering therapeutic enrichment for their fatigued patients.
Keywords: Non-invasive brain stimulation (NIBS), transcranial electric stimulation (tES), neuromodulation, personalization, depression.

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Occupational Therapy for Multiple Sclerosis: Overcoming Barriers to Implementing Best Practices

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Background: To facilitate successful implementation of evidence into occupational therapy (OT) clinical practice, it is important to assess the facilitators and barriers for this process.
Objective: To identify key determinants for implementing occupational therapy evidence into multiple sclerosis practice.
Method: Through an explorative literature review in five databases (Pubmed, Cinahl, Embase, Eric, OTDbase) and a clinician survey, barriers and facilitators related to the implementation of OT evidence, specific to MS are explored, and strategies to transform barriers into facilitators are outlined.
Results: Of 303 screened titles, none explored implementing evidence specifically for OT in multiple sclerosis. Instead, we selected indirect evidence, implementing evidence on OT for any indication. When looking at the broader focus on using OT evidence in general practice, we found relevant indirect evidence (n=11), which is categorized in barriers and facilitators related to innovation, individual professional, patient, social context, organizational context, and economic and political context. Subsequently, a survey was developed based on the identified barriers and facilitators and on existing questionnaires [Evidence Based Practice Questionnaire and short version of Evidence-based Practice Implementation Scales (competencies, beliefs, attitudes- organisations, implementation, self-efficacy)]. The survey was launched in Spring 2024 among occupational therapists working with people with MS. This survey will contextualize the findings of the explorative review to the OT practice with people with MS and allows for prioritizing important implementation determinants and selecting pertinent strategies to address these through a newly developed implementation plan.
Conclusion: This study represents a first step in the implementation plan, striving for the empowerment of occupational therapists to enhance their knowledge and align their practices with evidence-based interventions, strategically bridging the gap between research findings and practical, real-world application of effective and impactful approaches in occupational therapy settings for individuals with multiple sclerosis.
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Submission ID: 7; Submission Group: Outcome Measures; Submitter: Felipe Balistieri Santinelli

Prevalence and magnitude of distance walking fatigability in people with multiple sclerosis

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Introduction: Distance walking fatigability (DWF) is a common motor impairment among people with multiple sclerosis (pwMS). It is characterized by a 10% decline in the distance walked during the last minute of the 6-minute walking test (6MWT) compared to the first minute. Despite this known motor impairment, there is still a need for a deeper understanding of the prevalence and extent of DWF in pwMS.
Objective: To investigate the magnitude and prevalence of DWF in pwMS.
Methods: Two-hundred and two pwMS (EDSS: 4 [0-6.5]) performed the timed 25-foot walking test (T25FW) and; the 6MWT as fast and safe as possible. Minute-by-minute distance walked

was recorded. The distance walked index (DWI) of every minute was calculated in order to investigate the magnitude of change. Frequency analysis was performed to identify the prevalence overall but also for MS phenotype (Relapsing remitting-RR, primary- PP and secondary- SP progressive), EDSS (0-2.5, 3-4, 4.5-5.5, 6 and 6.5), and T25FW benchmarks (<6 seconds, 6-7.99 seconds, and ⩾8 seconds). The $DWI_{6\text{-}1}$ of ⩽-10% was used to define the presence of DWF or non-DWF (NDWF).

Results: DWF was present in 43.5% of pwMS with a magnitude of -23.2% (DWF) and -0.7% (NWDF). In accord to EDSS, DWF was found in 22.2% (0-2.5, $DWI_{6\text{-}1}$=14.8%), 40.5% (3-4, $DWI_{6\text{-}1}$=-17.1%), 63.4% (4.5-5.5, $DWI_{6\text{-}1}$=-22.9%), 49.1% (6, $DWI_{6\text{-}1}$=-26.4%) and 60% (6.5, $DWI_{6\text{-}1}$=-34.4%) pwMS. The prevalence of DWF was found in 34.9% (RR, $DWI_{6\text{-}1}$=-16.4%), 48.5% (SP, $DWI_{6\text{-}1}$=-27.4%), and 63.4% (PP, $DWI_{6\text{-}1}$=-29.3%). For the T25FW benchmarks, DWF was present in 31.9% (<6s, $DWI_{6\text{-}1}$=-15.3%), 47% (6-7.99s, $DWI_{6\text{-}1}$=-21.7%) and 60.7% (>8s, $DWI_{6\text{-}1}$=-31.2%).

Conclusion: DWF is a motor impairment with a high prevalence in overall pwMS. The prevalence and severity of DWF increase with disability, progressive phenotypes, and slower walking speeds. DWF measurement can be incorporated into clinical practice as it can aid in detecting early progression in pwMS.

Submission ID: 8; Submission Group: Outcome Measures; Submitter: Teresa L'Abbate

Functional balance at rest of hemispheric homologs in healthy volunteers and people with multiple sclerosis

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First, we will examine the concept of homology between dominant and non-dominant hemi-bodies, focusing on corticospinal tracts (CSTs) assessed by transcranial magnetic stimulation (TMS) to evoke resting state motor potentials (MEPs) in healthy volunteers (HV) and people with multiple sclerosis (PwMS). Furthermore, using the concept of resting state as an expression of the functional abilities of brain districts, we further investigate the functional homology of resting state by quantifying the similarity of temporal neurodynamic patterns of the right and left somatosensory areas of the hands (S1). All this to provide new measures of balance between homologous cortical areas of the hemisphere.

For CST homology, Fréchet distance between MEP morphologies in left and right muscles was measured in 40 HV and 10 tired PwMS before and after Faremus, a 5-day neuromodulation procedure against fatigue. Inter-sided similarity was assessed using normalized compression distance (NCD) between left and right S1 neurodynamics derived from magnetoencephalography (MEG) equipped with functional source separation (FSS). We hypothesized greater inter-lateral similarity than intra-lateral similarity.

The results confirmed our working hypothesis. With a smaller distance between sides than within Fréchet in the HV, Faremus changed physiological direction in the CST homology. The interhemispheric morphology increased with the prevalence of the right. In the somatosensory study, NCD evaluation verified the function hypothesis, and functional homology showed greater variability in older individuals.

Our findings confirm the significance of inter-lateral balanced homologous districts in learning processes, introducing a novel measure of circuit recruitment patterning.

The present exploration sheds light on how to measure the balance between homologous hemi-lateral structures, relevant for learning processes, by introducing measures of circuit recruitment patterning either via TMS or E/MEG. These tools allow an understanding of the origin of conditions where impaired neurodynamics occur, like fatigue, and the intervention mechanisms of personalized therapy.

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