

## Master thesis opportunity

### **MS-Balance: Relationship between changes in spatiotemporal, kinematic and kinetic gait parameters and clinical assessments of balance ability in patients with multiple sclerosis**

#### **Background:**

Multiple sclerosis (MS) is a chronic inflammatory neurological disease and affects the central nervous system. The immune system attacks itself leading to degeneration of the myelin, the insulating layer around the axon. As a result, disturbances in signal transmission occur. As a result of the degenerative processes MS patients experience a dysfunction in the ability of balance and gait abnormalities. Even in early stages of MS these deficits are present. In later stages the loss of balance ability is the primary cause of falling associated with further injuries. Also, It is well established that persons with MS have greater gait variability compared to age and gender matched controls without MS. Evidence indicates that disability level, assistive device use, attentional requirement, and fatigue are related to gait variability in persons with MS.

A variety of clinical assessment to evaluate static and/or dynamic balance ability exists. However, it is unclear in how far these assessments correlate with an altered variability in certain spatiotemporal parameters and also with changes in kinematic as well as kinetic variables.

#### **Aim and tasks:**

The objective of this study is to evaluate the relationship between the variability in spatio-temporal parameters of gait plus changes in kinematic and kinetic variables and commonly used clinical assessments of static or dynamic balance ability of patients with MS.

#### **Requirements:**

- Interest in 3D-gait analysis
- Friendly and courteous treatment of patients
- Proficiency in use of MS Office
- Knowledge of Good Clinical Practice principles in research
- Basic knowledge of data analyses with appropriate software
- Highly motivated and team-oriented working morale

#### **Offer:**

- Introduction and supervision throughout the entire project
- Already approved ethics proposal
- Exciting opportunities in an interdisciplinary environment of clinical research and rehabilitation
- Possibility to visit various departments involved in rehabilitation of neurologic and orthopaedic patients.

#### **Time period:**

Begin XXX 2024. Duration: x to x months.

For further questions, please contact Dr. F.Behrendt, Research Department, Reha Rheinfelden ([f.behrendt@reha-rhf.ch](mailto:f.behrendt@reha-rhf.ch)). To check for further opportunities at our department, go to: <https://www.reha-rheinfelden.ch/ueber-uns/wissenschaft/>