

# SENSORIMOTOR TRAINING IN REHABILITATION – ARE THE STIMULI FUNCTIONALLY ENOUGH?

Patric Eichelberger<sup>1</sup>, Slavko Rogan<sup>1,2</sup>

<sup>1</sup>Bern University of Applied Sciences, Department of Health Professions, Division of Physiotherapy, Bern, Switzerland

<sup>2</sup>Academy for integrative Physiotherapy and Training Education, Grenzach-Wyhlen, Germany

## Introduction

Sensorimotor training (SMT) is used in rehabilitation and prevention to improve the slowed muscle reflexes. This is usually done with the aid of active devices, such as whole-body vibration devices (WBV), as well as passive therapy devices, such as foam mats, balance boards, etc. (Fig. 1).

## Purpose

The question that arises is if these devices could produce the necessary stimuli for the sensorimotor system in order to obtain the desired motor response.

## Method

A narrative literature review was carried out.

## Results

Investigations described that passive therapy devices produce primary weak stimuli below 3 Hz. Active treatment devices could produce stimuli between 1 Hz to 60 Hz.

## Conclusion

The movement control and movement coordination are subject to the functional capability of the sensorimotor system. This includes the recording, its forwarding and the signal transmission. In daily life, a muscle response must occur within a certain time frame, with the aim to stabilizing a joint or to keep the body in balance. For example, the quadriceps muscle must contract during walking within 125 to 200 ms (Fig 2.) or during stairs climbing within 100 to 150 ms (Fig 3). Implemented to treatment modalities, a frequency range between 3 and 6 Hz should be used.



Fig. 1 Overview of SMT devices

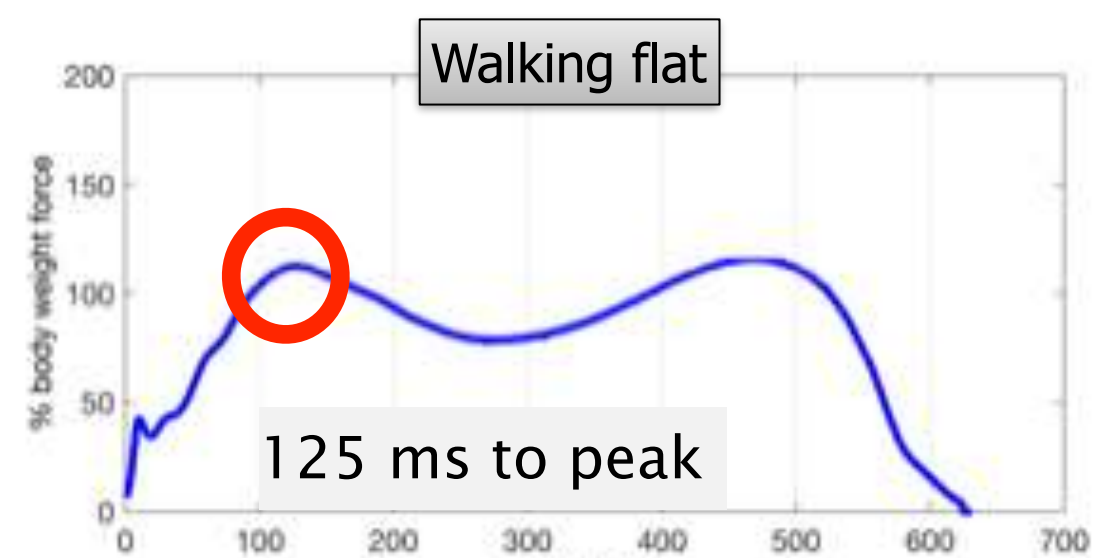


Fig. 2 Muscle activation during walking flat (own results)

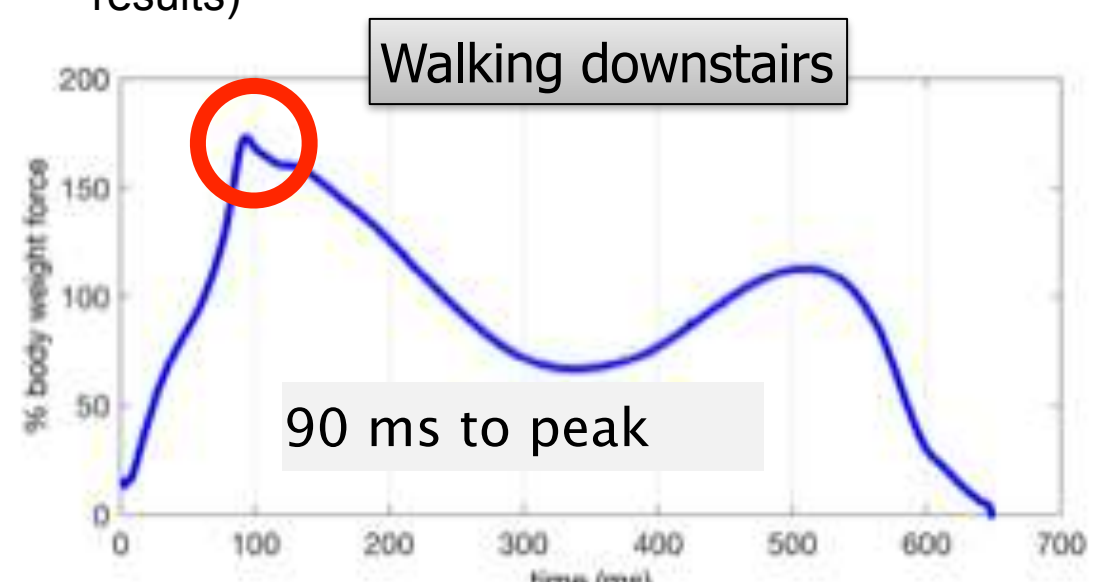


Fig. 3 Muscle activation downstairs walking (own results)