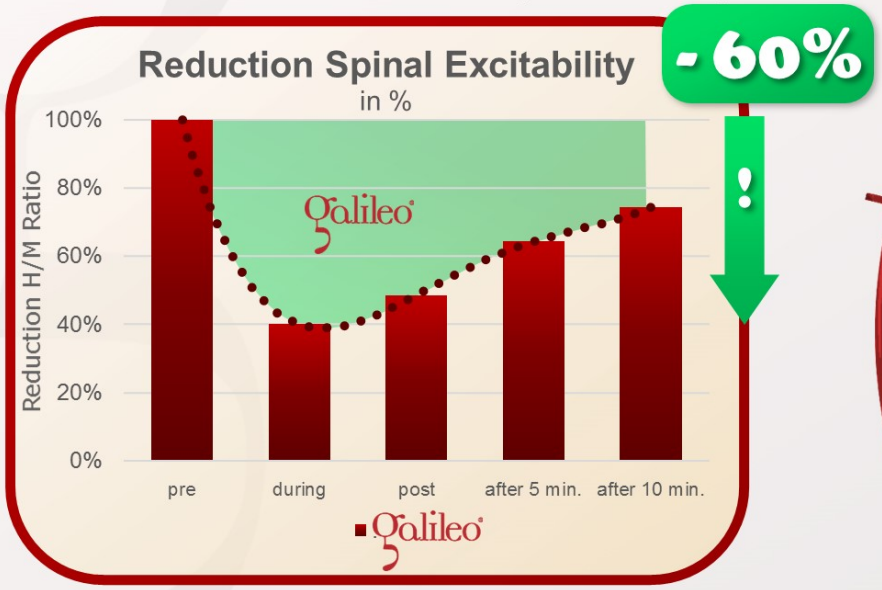
Can 60 seconds of Galileo Training reduce Spinal Excitability significantly ?

The answer is: YES

This study examined the short-term effect of Galileo Training on Spinal Excitability which is the sensitivity of the stretch reflex to a defined external stimulus (1 Min., 22Hz, pos. 2, 30° flexed knee). There is an obvious decrease of 60% during the Galileo Training and even 10 minutes after the training still a decrease of over 25%. This effect is one of the main reasons why Galileo Training is effective in reduction of Spasticity.



Ritzmann R, Kramer A, Gollhofer A, Taube W: The effect of whole body vibration on the H-reflex, the stretch reflex, and the short-latency response during hopping.; Scand J Med Sci Sports, 23(3):331-9, 2013; PMID: 23802287; GID: 2850

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Why are the results of this study so important? Galileo Training is not only sufficient to (re-) establish neuromuscular functions but also it's an ideal preparation before standard therapy.

The Spinal Excitability describes the sensitivity of the neuronal system as a reaction to an external stimulus – the higher the H/M Ratio (Spinal Excitability) the more intense is the reaction of the neurological system.

An "active" spasticity, like it usually develops after a SCI accident within the first 12 months, can be seen similar to a cramp in the calf one gets at night: a small movement of the foot suddenly leads to an extreme response by the system – a cramp. An "active" spasticity is due to a similar effect: since there is a lack of signaling from the brain the spinal cord gets more and more sensitive and therefore easily overreacts to small external perturbations: the spasm.

Galileo Training at high frequencies (>20Hz) can significantly reduce this sensitivity and therefore reduce spasticity in the short- and mid-term. This effect can be used to decrease and to manage spasticity. This can open a windows of opportunity for standard therapy since in this period therapy can address functions which would usually be impossible due to the spasticity.

Scand J Med Sci Sports. 2013 Jun;23(3):331-9.

The effect of whole body vibration on the H-reflex, the stretch reflex, and the short-latency response during hopping.

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Abstract

The effect of whole body vibration (WBV) on reflex responses is controversially discussed in the literature. In this study, three different modalities of reflex activation with increased motor complexity have been selected to clarify the effects of acute WBV on reflex activation: (1) the electrically evoked H-reflex, (2) the mechanically elicited stretch reflex, and (3) the short-latency response (SLR) during hopping. WBV-induced changes of the H-reflex, the stretch reflex, and the SLR during hopping were recorded in the soleus and gastrocnemius muscles and were analyzed before, during (only the H-reflex), immediately after, 5 min and 10 min after WBV.

The main findings were that (1) the H-reflexes were significantly reduced during and at least up to 5 min after WBV, (2) the stretch reflex amplitudes were also significantly reduced immediately after WBV but recovered to their initial amplitudes within 5 min, and (3) the SLR during hopping showed no vibration-induced modulation.

With regard to the modalities with low motor complexities, the decreased H- and stretch reflex responses are assumed to point toward a reduced Ia afferent transmission during and after WBV.

However, it is assumed that during hopping, the suppression of reflex sensitivity is compensated by facilitatory mechanisms in this complex motor task.

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