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Presentation Title:

Translation of principles of motor control to improve sensorimotor outcomes following brain injury

Abstract:

Current rehabilitation approaches for sensorimotor recovery in people with central nervous system lesions are based on principles of neuroplasticity, such as repetitive practice of salient task-related movement. However, recent findings from multi-center randomized controlled trials investigating different types of interventions for upper limb post-stroke recovery, generally do not lead to improvements in sensorimotor outcomes beyond those expected from usual care. This

may be due to insufficient translation of basic physical and physiological principles underlying motor control and learning into the design of rehabilitation strategies (clinical interventions). These principles are considered in light of current evidence from neurophysiological studies with a focus on the capacity of the nervous system to shift the tonic stretch reflex threshold in task-specific way, while considering the dynamics of the body-environment interaction during task practice. A bench-to-bedside approach based on the threshold control theory may be a promising approach to improve sensorimotor outcomes in patients with neurological deficits.