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ED28-001-e

A diagram to depict the action of rehabilitation interventions based on the models of disability of the International Classification of Functioning, Disability and Health (ICF) and the Disability Creation Process (DCP)

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The International Classification of Functioning, Disability and Health (ICF) launched in 2001 by the World Health Organization (WHO) has become a worldwide recognized framework for reporting and analysing handicaps, establishing individual rehabilitation needs and planning rehabilitation interventions. The classic diagram of the ICF depicts in a self-explanatory manner how and where health conditions and context factors (personal and environmental) influence functioning and induce handicaps. Human functioning can be influenced either by a direct action on body functions and structures, activity and participation or by indirect interventions on context factors. If the classical diagram is used to describe how and where rehabilitation interventions act upon functioning or handicaps, the diagram becomes puzzled and its lecture complicated.
By integrating the ICF model into an adapted version of the DCP frame, a much clearer and more self-explanatory diagram for rehabilitation interventions can be created. This diagram will be presented and discussed side by side with the classic ICF diagram.
Further reading
The international classification of functioning, disability and health: ICF. Geneva: World Health Organization; 2001.
Fougeyrollas P, Cloutier R, Bergeron H, Côté J, St Michel G. Classification québécoise. Processus de Production du Handicap. Québec: RIPPH; 1998.

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Non-invasive brain stimulation and rehabilitation

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Keywords: Transcranial magnetic stimulation; Stroke; Rehabilitation
Several methods of non-invasive stimulation of the human brain, such as transcranial magnetic stimulation (TMS) and transcranial direct current stimulation (TDCS) are now available, and there is good evidence that several of the available protocols are capable of inducing synaptic plasticity in the connections of the cerebral cortex. Rehabilitation techniques in patients, e.g. after stroke, involve re-learning to use the affected limb(s), presumably also via processes involving synaptic plasticity in the brain. Thus there is considerable interest at the present time in harnessing non-invasive methods to improve the response to therapy by facilitating synaptic changes in CNS. I will summarise the evidence in favour of this approach in both healthy volunteers and in patients after stroke. Data from small clinical trials suggests that the methods may be useful. However the results vary greatly between patients and new work is focused on identifying people who are most likely to respond well. I will discuss reasons for this variation and potential new approaches to improving response rate in future trials.

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The effectiveness of non-invasive cortical stimulation, combined with a task-oriented training, for motor recovery after stroke: Lessons from TMS and tDCS studies

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Keywords: Stroke; Non-invasive cortical stimulation; Upper limb recovery
Upper limb impairment is a main factor of persisting disability after stroke occurring in more than 69% of patients in the acute phase and persisting in 56% of them at 5 years of stroke.
In the last 50 years several rehabilitation approaches have been developed, aimed to recover the upper limb function. Since the '90s, the interest of the scientific world has been oriented towards non-invasive neurophysiological methods that can modulate the excitability of neural circuits, "in vivo", thus enhancing the brain neuroplasticity after stroke in its early stages and expanding the therapeutic window also in chronic phase. These methods, known as Repetitive Transcranial Magnetic Stimulation (rTMS) and Transcranial Direct Current Stimulation (tDCS), generate changes in the membrane potential of neurons, alternatively inducing either inhibitory or excitatory effects.
Although neuromodulation is claimed as a means to reduce interhemispheric imbalance, increasing ipsilesional excitability and/or reducing contralateral excitability, some questions remain that stimulate scientific research to invest resources in new clinical trials aimed to demonstrate the efficacy of non-invasive cortical stimulation in the acute phase, and to state which rehabilitation approach should be combined with cortical stimulation in order to achieve best functional results.

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