

Motor rehabilitation

Brain-computer interfaces (BCIs) based on **functional electrical stimulation** have been used for upper extremity motor **rehabilitation** after **stroke**. However, little is known about their **efficacy** for multiple BCI treatments. In a study, 19 stroke patients participated in 25 upper extremity followed by 25 lower extremity BCI training sessions.

Methods: Patients' functional state was assessed using two sets of clinical scales for the two BCI treatments. The Upper Extremity Fugl-Meyer Assessment (FMA-UE) and the 10-Meter Walk Test (10MWT) were the primary outcome measures for the upper and lower extremity BCI treatments, respectively.

Results: Patients' motor function as assessed by the FMA-UE improved by an average of 4.2 points ($p < 0.001$) following upper extremity BCI treatment. In addition, improvements in activities of daily living and clinically relevant improvements in hand and finger spasticity were observed. Patients showed further improvements after the lower extremity BCI treatment, with walking speed as measured by the 10MWT increasing by 0.15 m/s ($p = 0.001$), reflecting a substantial meaningful change. Furthermore, a clinically relevant improvement in ankle spasticity and balance and mobility were observed.

Discussion: The results of the current study provide evidence that both upper and lower extremity BCI treatments, as well as their combination, are effective in facilitating functional improvements after stroke. In addition, and most importantly improvements did not stop after the first 25 upper extremity BCI sessions ¹⁾.

¹⁾

Sieghartsleitner S, Sebastián-Romagosa M, Cho W, Grünwald J, Ortner R, Scharinger J, Kamada K, Guger C. Upper extremity training followed by lower extremity training with a brain-computer interface rehabilitation system. *Front Neurosci*. 2024 Mar 4;18:1346607. doi: 10.3389/fnins.2024.1346607. PMID: 38500488; PMCID: PMC10944934.

From:

<https://neurosurgerywiki.com/wiki/> - **Neurosurgery Wiki**

Permanent link:

https://neurosurgerywiki.com/wiki/doku.php?id=motor_rehabilitation

Last update: **2024/06/07 02:52**

