Abstract: Facilitation of implicit learning of a hand motor sequence after a single session of neurofeedback training of alpha power recorded from the motor cortex has been shown in healthy individuals (Ros et al., Biological Psychology 95:54-58, 2014). This facilitation effect could be potentially applied to improve the outcome of rehabilitation in patients with impaired hand motor function. In the current study a group of ten patients diagnosed with cerebral palsy trained reduction of alpha power derived from brain activity recorded from right and left motor areas. Training was distributed in three periods of 8 min each. In between, participants performed a serial reaction time task with their non-dominant hand, to a total of five runs. A similar procedure was repeated a week or more later but this time training was based on simulated brain activity. Reaction times pooled across participants decreased on each successive run faster after neurofeedback training than after the simulation training. Also recorded were two 3-min baseline conditions, once with the eyes open, another with the eyes closed, at the beginning and end of the experimental session. No significant changes in alpha power with neurofeedback or with simulation training were obtained and no correlation with the reductions in reaction time could be established. Contributions for this are discussed.