



In Motion

Highlighting Articles Advancing Pain Research in Canada and the World

Featured article:

Champagne, P., Blanchette, A., & Schneider, C. **Continuous theta-burst stimulation on the unlesioned hemisphere improves motor function in chronic stroke patients: A case study.** *Brain Disorders*, 9 (2023), 100062. <https://doi.org/10.1016/j.dscb.2022.100062>

Key insights from the study:

- **Innovative Treatment Method:** This chronic stroke case study explored that inhibiting the unlesioned hemisphere (by continuous theta-burst stimulation or cTBS), rather than activate it, improved hand motor function.
- **Positive Motor Improvements:** The cTBS treatment improved hand motor control, motor excitability, and reduced spasticity, with lasting effects over three months.
- **Potential for Personalized Therapy:** The results suggest that adapting stimulation protocols based on individual brain characteristics (i.e. inhibition vs. activation of the unlesioned hemisphere) could lead to optimized rehabilitation for stroke patients and may provide insights for chronic pain management strategies.

What happened?

Researchers conducted a case study on a 60-year-old man who sustained an ipsilateral stroke 8.5 years ago. They compared three brain stimulation protocols of the unlesioned hemisphere (sham stimulation, activatory stimulation, inhibitory stimulation, one session each). The inhibitory protocol (cTBS) improved the clinical outcomes in a single session. The patient then underwent 10 sessions of cTBS with measurements taken before, during, and after the treatment. The results showed improved motor control, better hand function, and reduced muscle stiffness that lasted for months after the treatment.

Why is it important?

This study provides promising evidence that cTBS of the unlesioned side of the brain can significantly improve motor function in patients with chronic stroke with still remaining hand function on the paretic side. The findings suggest that the choice of the protocols (inhibition vs. activation of the unlesioned hemisphere) should rely on the pre-treatment condition of the patients. This offers a new path for rehabilitation even years after a stroke. The results in improved hand motor control, motor excitability, and reduced spasticity, may also contribute to pain relief.

What now?

Future research should focus on testing this technique in a larger group of patients with chronic stroke and living with pain and exploring how brain stimulation can be tailored to each individual's recovery needs. These findings open doors to more personalized treatment approaches that could enhance recovery outcomes for stroke survivors, making long-term rehabilitation more effective. This innovative approach not only enhances motor function in chronic stroke but may also offer insights for managing chronic pain, particularly in addressing associated motor deficits and improving overall functional outcomes.

