

tDCS in Post-Stroke Rehabilitation

Country	Czech Republic
Institution/Organisation	General University Hospital in Prague
Type of setting	University hospital and clinical research environment
National Context	Stroke is a major cause of disability in the Czech Republic, and cognitive rehabilitation remains limited. Neuromodulation is increasingly viewed as a promising method to enhance recovery in the subacute phase.

The project employed tDCS to support cognitive recovery in post-stroke patients. This included delivering targeted stimulation to the prefrontal cortex and combining it with cognitive training to enhance attention, memory, and executive functioning.

Implementation Process

- **Steps Taken:** tDCS was approved by the ethics committee, integrated into a three-week rehab program, and applied cognitive training after staff received targeted training.
- **Stakeholders Involved:** Neurologists, rehabilitation therapists, neuropsychologists, patients, families, and device specialists.
- **Timeframe:** Three-week structured cognitive rehabilitation protocol.

Impact and Results

- **Quantitative Results:** tDCS led to measurable gains, including a 25% improvement in verbal working memory, a 30% increase in attention task speed, and high adherence without adverse effects.
- **Qualitative Outcomes:** Patients reported clearer thinking and greater motivation, while therapists observed faster cognitive responses and improved functional independence.

Success Factors

- Strong collaboration between neurology, rehabilitation, and psychology teams.
- Effective training and support for staff operating the Rebox-Physio tDCS system.
- Tailored stimulation protocols aligned with the cognitive needs of post-stroke patients.

Challenges and Barriers

- Defining clear inclusion criteria and optimal timing of tDCS.
- Maintaining consistent engagement and tolerance during repeated cognitive–stimulation sessions.
- Addressing logistical limits related to device availability and scheduling within the rehabilitation unit.

Key Lessons Learned

- Personalized staff training and clear clinical protocols are essential for the safe and effective use of tDCS in post-stroke rehabilitation.
- Strong involvement of multidisciplinary teams enhances both the impact and long-term sustainability of neuromodulation-based cognitive interventions.