

# Small 'window of opportunity' for best recovery after stroke

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An international study has shown, for the first time, that the capacity of the human brain to recover and rewire itself peaks around two weeks after a stroke and diminishes over time.

The finding, published today in the *Neurorehabilitation and Neural*

*Repair* journal, is the result of a study in London and Adelaide that followed the recovery of 60 [stroke patients](#) up to one year after their stroke.

Lead author Dr. Brenton Hordacre, from the University of South Australia, says the multi-site study showed conclusive evidence that the [brain](#) only has a small window of opportunity to more easily repair itself after stroke.

"Earlier animal studies suggested this was the case, but this is the first time we have conclusively demonstrated this phenomenon exists in humans," Dr. Hordacre says.

The researchers scanned the brains of stroke survivors as they recovered over 12 months. They found that in the initial days following an [ischemic stroke](#) (caused by a blocked artery to the brain), the brain has a greater capacity to modify its neural connections and its plasticity is increased.

"It is during this early period after stroke that any physiotherapy is going to be most effective because the brain is more responsive to treatment.

"Earlier experiments with rats showed that within five days of an ischemic stroke they were able to repair damaged limbs and neural connections more easily than if therapy was delayed until 30 days post stroke."

The researchers used continuous transcranial magnetic stimulation (cTBS) to repetitively activate different hemispheres of the motor cortex to measure brain plasticity.

The Adelaide laboratory tested the stroke damaged motor cortex, which is the main area that controls movement. The London laboratory tested

the non-stroke damaged hemisphere which is also important to help recovery.

"Our assessments showed that plasticity was strongest around two weeks after stroke in the non-damaged motor cortex. Contrary to what we expected, there was no change in the damaged hemisphere in response to cTBS."

Dr. Hordacre says the findings confirm the importance of initiating therapy as soon as possible after a stroke.

Current evidence indicates that less than eight minutes of daily therapy is dedicated to upper limb recovery within the first four weeks of a stroke.

"Delivering more treatment within this brief window is needed to help people recover after [stroke](#).

"The next step is to identify techniques which prolong or even re-open a period of increased brain plasticity, so we can maximise recovery," Dr. Hordacre says.

**More information:** Brenton Hordacre et al. Evidence for a Window of Enhanced Plasticity in the Human Motor Cortex Following Ischemic Stroke, *Neurorehabilitation and Neural Repair* (2021). [DOI: 10.1177/1545968321992330](#)

Provided by University of South Australia

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