

# ` Quick Review of Model System Research

## Which Behaviours are First to Emerge During Recovery

## of Consciousness After Severe Brain Injury?

### What is the study about?

### This study aims to determine which behaviorial signs of consciousness emerge first, and to estimate the time course to recovery of consciousness in patients with severe acquired brain injury. Early detection of consciousness after severe brain injury is critical for establishing an accurate prognosis and planning appropriate treatment.

### What did the study find?

This study found that recovery of consciousness after severe brain injury is most often signaled by reemergence of

visual pursuit (visual tracking), which occurs when one or both eyes follow movement of a mirror without loss of fixation for at least 45 degrees from midline. Response must occur at least twice in any direction over 4 trials. Reproducible command-following and automatic movements were also frequent behavioral markers of consciousness recovery. Clinicians should use assessment measures that are sensitive to these behaviours in order not to miss the transition from unconscious to conscious states.

### Who participated in the study?

Individuals with traumatic (n=34) or non-traumatic brain injury (n=45) who were at least 17 years old, a documented medical diagnosis of coma or diagnosis of unresponsive wakefulness syndrome/vegetative state on admission to a disorders of consciousness program, and evidence of transition to consciousness during inpatient rehabilitation.

### How was the study conducted?

This study was a retrospective observational study using the Coma Recovery Scale-Revised and days to recovery of consciousness. Demographic (sex, severity of brain injury, level of care and time since injury) and behavioral data were retrospectively extracted from a REDCap database that houses clinical data elements collected by multidisciplinary rehabilitation teams caring for patients admitted to a specialized inpatient disorders of consciousness rehabilitation program.

### How can people use the results?

### Individuals with brain injury and their families can use the results of this study to better understand which behaviors are first to appear during recovery of consciousness after severe brain injury. Practitioners can use the results of this study to help modify assessment methods for measuring the first behavioural signs of consciousness in patients: visual pursuit, command-following, and automatic movements. Assessment practices that are sensitive enough for early detection of these emerging behaviours may help improve inpatient recovery.

### Reference

Martens, G., Bodien, Y., Sheau, K., Christoforou, A., & Giacino, J. T. (2020). Which behaviours are first to emerge during recovery of consciousness after severe brain injury? *Annals of Physical and Rehabilitation Medicine,* *63*(3), 263-269.

**Disclaimer**

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