

Natural History of Recovery from Brain Injury After Prolonged Disorders of Consciousness

By Douglas Katz, M.D.

The natural history of recovery from brain injury typically consists of a period of impaired consciousness, a subsequent period of confusion and amnesia, followed by a period of post-confusional recovery of function. Patients with more severe injuries may have more prolonged episodes of unconsciousness or minimal consciousness and may not fully evolve through this continuum of recovery.

There is limited information on the course of recovery and long-term outcome of patients with prolonged unconsciousness, particularly those with extended periods in the minimally conscious state. Further, patients with impaired consciousness are frequently denied access to hospital-based rehabilitation services because of uncertain prognosis and a perceived lack of benefit from rehabilitative interventions.

Consequently, a study was conducted involving a consecutive series of 36 patients with traumatic (TBI) and non-traumatic brain injury (nonTBI) in a vegetative state (VS) or minimally conscious state (MCS) on admission to a specialized, slow-to-recover brain injury program in an acute rehabilitation hospital. The patients were retrospectively reviewed to evaluate course of recovery during rehabilitation hospitalization and in follow-up, 1–4 years post-injury.

There were a number of independent variables in the study, including time to resolution of VS, MCS and confusional state/posttraumatic amnesia (CS/PTA) based on a variety of industry criteria. In addition, outcome measures (calculated separately for TBI, nonTBI, VS, or MCS on admission subgroups) included proportion of patients who recover and recovery time to MCS, CS/PTA stages, household independence, and return to school or work, as well as Disability Rating Scale (DRS) scores at 1, 2, 3, and 4 years post-injury.

The results? The majority of the patients emerged from MCS (72%) and CS/PTA (58%) by latest follow-up. It took significantly longer for patients admitted in VS (16.43 weeks for MCS, 30.1 weeks for CS/PTA) than MCS (7.36 weeks for MCS, 11.5 weeks for CS/PTA) to reach both milestones. What's more, almost all who failed to clear CS/PTA by latest follow-up were

patients with nonTBI or TBI, with VS lasting over eight weeks.

The duration of MCS was a strong predictor of the duration of CS/PTA after emergence from MCS, accounting for 57% of the variance. Nearly half the patients followed at least one year achieved recovery to, at least, daytime independence at home and 22% returned to work or school, with 17% at or near pre-injury levels.

The conclusions drawn from this study? Patients in VS whose transition to MCS occurred within eight weeks of onset are likely to continue recovering to higher levels of functioning, a substantial proportion to household independence, and productive pursuits. Patients with TBI are more likely to progress than patients with nonTBI, though significant improvement in the nonTBI group is still possible. As a result, active, higher intensity rehabilitation should be strongly considered for patients with severely impaired consciousness after brain injury, especially for patients with TBI who have signs of progression to MCS.

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