

The Role of Physical Therapy in Patients with Disorders of Consciousness

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FACT SHEET



Physical therapists have long been recognized as having a beneficial role in the recovery of patients following brain injuries, particularly in the areas of motor control, gait, and balance. Less recognized is the role physical therapy can play in patients with more severe brain injuries, particularly those with disorders of consciousness (DOC). These disorders of consciousness include coma (Rancho I), vegetative state (Rancho II), and minimally conscious state (Rancho III). The defining clinical feature of a coma is the absence of sleep-wake cycles and complete loss of arousal¹. The eyes remain closed and there is no motor function other than primitive reflexes. Patients who are in a vegetative state are in a state of wakeful unconsciousness. The defining clinical feature of the vegetative state is intermittent periods of wakefulness with spontaneous eye-opening, despite the continued absence of any evidence of language comprehension, verbal or gestural communication, or purposeful responses to stimuli¹. The emergence into a minimally conscious state is characterized by minimal but definite behavioral evidence of self or environmental awareness. The patient remains in a state of severely altered consciousness with intermittent periods of wakefulness with inconsistent following of one-step commands and the ability to localize noxious stimuli¹. These patients also demonstrate (though inconsistently) automatic movement sequences, visual tracking, object recognition and object manipulation.

The purpose of this paper is to highlight the evidence to support the various roles physical therapy may have as part of the treatment team for a patient following severe brain injury who demonstrate a DOC.

Prevention

Patients with prolonged intensive care unit (ICU) stays are known to be at risk for many secondary complications due to prolonged inactivity and new onset of neurologic deficits. Therapeutic intervention in the ICU has been shown to reduce total length of stay, overall time to recovery, and development of hospital complications, such as pneumonia and deep vein thrombosis². Specific to patients with DOC, these secondary effects often continue to be a burden throughout rehabilitation, increasing rates of readmission and reducing the effectiveness of long term rehab due to physiologic changes that have occurred as a result of a period of immobility³. Moreover, several studies have examined the effects of early mobilization for patients with and without severe brain involvement and found that there were no adverse effects to mobilizing patients as soon as they were medically stable^{2,4-5}. Therefore, physical therapy should be involved early and aggressively in patients following traumatic brain injury.



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Assessment

Patients with DOC are misdiagnosed at rates often exceeding 40%⁶⁻⁷. One of the most commonly cited reasons for this error is the lack of prolonged, structured assessment. Following a severe traumatic brain injury, activity is often inconsistent or sleep wake cycles have been disrupted, and behaviors may be occurring at a time when everyone else is asleep. Motor control is another commonly recognized reason for misdiagnosis³. If motor planning or motor control is impaired, patients may not be able to form a recognizable response to the medical team. As physical therapists, we have long recognized the need to first focus on automaticity in tasks before working to refine the behavior with regard to motor recovery. Applying this principle to patients with DOC may allow patients to harness motor activity for purposeful tasks which can then be carried over to other areas of assessment.

Recovery

Finally, in patients following severe TBI, exercise has been shown to induce neurocognitive function improvements and upregulation of cellular components responsible for brain function and recovery⁸. While little is known about the direct effects of exercise-induced changes in patients with DOC, there is substantial evidence that the factors upregulated by exercise have been shown to have a role in brain recovery post injury. Moreover, when introduced synthetically, these factors are not as valuable as when the body produces them directly.

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