

# Minimally conscious state



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The vegetative state and the minimally conscious state are disorders of consciousness that can be acute and reversible or chronic and irreversible. Various lesions involving the brainstem, thalami, cortical neurons, or the white matter tracts that interconnect them can cause the vegetative state or minimally conscious state. Vegetative state has a poor prognosis for recovery of awareness when present for more than a year in traumatic cases and for 3 months in non-traumatic cases. Patients in minimally conscious state are poorly responsive to stimuli, but show intermittent awareness behaviors. Indeed, findings of preliminary functional imaging studies suggest that some patients could have substantially intact awareness. The outcomes of minimally conscious state are also variable.

I review the clinical definition and criteria as well as functional neuroanatomical basis for coma, vegetative state, and minimally conscious state. Functional neuroimaging allows new insights into cerebral activity in patients with impaired consciousness from severe brain damage. Measurements of cerebral metabolism and brain activations in response to sensory stimuli with positron emission tomography, functional MRI, and electrophysiological methods can provide valuable information on the presence, degree, and location of any residual brain function. Such studies are disentangling the neural correlates of the vegetative state from the minimally conscious state, and have major clinical consequences in addition to empirical importance for the understanding of consciousness. However, use of these techniques in people with severe brain damage is methodologically complex and needs careful quantitative analysis and interpretation. In addition, ethical frameworks to guide research in these patients must be further developed.

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