

ABSTRACT

## Does Management at a Neuroscience Centre Improve Outcomes for Patients with a Severe Traumatic Brain Injury? A Systematic Review

Ben Jones

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Patients with severe Traumatic Brain Injuries (TBI) require management in hospital. However, should they be directly transported to a Neuroscience Centre (NC) or can they be safely treated at a local hospital before being subsequently transferred to an NC? This systematic review was undertaken to evaluate what effect transfers to an NC had on mortality rates amongst adult patients with a severe TBI. A systematic literature review was conducted using the databases Medline, CINAHL, Google Scholar and Cochrane. The inclusion criteria were: published between 2010 and 2023, adult patients ( $\geq 18$ ) with severe TBI (Glasgow coma scale  $\leq 8$ ). The primary outcome studied was mortality. The secondary outcomes were, the impact that subsequent transfer to an NC had on mortality, the delay subsequent transfer had on surgery, and the accuracy of Emergency Medical Service (EMS) triage. The review analysed seven studies. Four reported no statistically significant difference in mortality in patients taken to an NC, despite NCs receiving more severely injured patients. Transferring patients from a local hospital to an NC was significantly associated with reduced mortality in one study (aOR, 0.79, 95% CI, 0.64-0.96), and reduced 24-hour (RR 0.31, 0.11-0.83) and 30-day (RR 0.66, 0.46-0.96) mortality in another. Subsequent transfers prolonged delays to surgery in several studies but were not statistically significant. This systematic review found that directly transporting severe TBI patients to an NC did not improve mortality. Mortality at 24-hour and 30-days was significantly reduced in patients who were subsequently transferred to an NC. A subset of patients benefit from urgent neurosurgical intervention as direct transfer to an NC improved their mortality rates. Severe TBI patients were accurately recognised by EMS staff. The skewing of more severely injured patients directly transported to an NC may be masking any survival benefit of direct NC admission.