

## Funding gap in acute care treatment costs for patients with traumatic spinal cord injury in New South Wales, Australia

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**Introduction:** Patients with acute traumatic spinal cord injury (TSCI) have complex healthcare needs requiring significant resource utilisation. Major trauma consensus best-practice guidelines in Australia recommend acute TSCI care be delivered in trauma or specialist spinal cord injury (SCIU) hospitals. While specialist hospitals aim to achieve greater efficiency and patient outcomes with condition-specific care, treatment costs are not necessarily lower than non-specialist hospitals, nor the current payment system adequately reimbursing any differences. Insufficient reimbursement under the current AR-DRG based funding systems can lead to an unfair burden on trauma/specialist hospitals and could adversely influence quality of care. This study aims to quantify the gap in funding between actual acute-care treatment costs and hospital reimbursement under the current system for acute TSCI.

**Methods:** Study patients were aged 16 years or older, sustained incident TSCI from June 2013-June 2016 in NSW, identified in record linked health data using TSCI-related ICD-10AM codes within hospital separation records. Costs were estimated firstly using the District Network Return (DNR) data to estimate costs incurred by the health service providers in a bottom-up costing approach. The second approach was based on the National Weighted Activity Units (NWAU) assigned to ABF activity. The funding gap was determined as the difference in the cost estimates between both approaches. The funding gap in acute-care treatment costs for patients with TSCI was examined at the Australian peer grouping level and at general hospitals compared with trauma centres and SCIUs.

**Results:** 534 patients sustained an acute incident TSCI over the study period, accounting for 811 acute-care hospital separations within index episodes. The majority were male, (74%) with a mean (SD) age of 54 (22) years. The total acute-care treatment cost was estimated at \$40.5 million; median (IQR) cost per patient was \$45,473 (\$15,535–\$94,612) using the DNR costing method. Using the NWAU costing method the total cost was \$29.9 million; median (IQR) \$37,999 (\$15,502-\$64,462). Most separations were at principal referral hospitals (83%) and these hospitals were underfunded by \$5.3 million over 3 years. The funding gap in total costs was greatest for the SCIU co-located with Major Trauma Service (MTS) at \$4.4 million and, SCIU without MTS at nearly \$1.1 million over the study period. The MTS, metropolitan and regional hospitals were relatively over-funded under the NWAU approach.

**Conclusion:** This study analysed the extent to which AR-DRG based funding reimbursements reflected actual costs incurred by hospitals providing acute-care treatment for patients with TSCI in NSW over a 3-year study period. The findings provide evidence of a shortfall in the case-mix funding to public hospitals under the activity-based funding for resource-intensive care such as patients with TSCI. Specifically, depending on the classification system, the principal referral hospitals, the SCIU co-located with a major trauma centre and stand-alone SCIU were under-funded whilst the other non-specialist hospitals were over-funded for the acute-care treatment of patients with TSCI. These findings may have service redesign policy implications and provide evidence for additional loadings for specialist hospitals treating low volume resource intensive patients.