

We read with interest the paper from McCredie et al<sup>1</sup> in *Critical Care Medicine*. The authors retrospectively analysed data from 9773 patients from 134 intensive care units (ICUs), obtained between 2011 and 2013, extracted from a quality improvement dataset (the American College of Surgeons Trauma Quality Improvement Program; ACS TQIP). They used these data to seek associations between structures and processes of care and in-hospital mortality in traumatic brain injury (TBI). Their analysis showed that clinical outcome was not related to ICU structure (dedicated neurocritical care units vs. general ICUs), but was improved by the presence of standardised management protocols. We would make the following comments.

We were delighted that their results broadly replicate results that we have previously published.<sup>2,3</sup> However, we were disappointed that they did not cite our publications which addressed very similar questions in a prospective comparative effectiveness research study of 3210 patients with TBI admitted to ICUs in the United Kingdom (the Risk Adjustment in Neurocritical Care study; RAIN).

We compared clinical outcomes (risk adjusted using the IMPACT Laboratory prognostic scheme<sup>4</sup>) in patients with TBI admitted to ICUs in non-neurosurgical centres, and to either specialist neurocritical care units or general ICUs in neurosurgical centres. McCredie et al report on in-hospital mortality, but this endpoint and timing does not provide a complete picture of outcome in acute neurological illness, so we also examined the impact of ICU structure on six-month extended Glasgow Outcome Scale. We found that outcomes were better and more cost-effective in specialist neurosurgical centres, but were no different between general ICUs or neurocritical care units within those centres.

The two studies show broadly concordant results in terms of showing no clinical benefit from care in dedicated neurocritical care units when compared to general ICUs. However, our study also provides complementary information in terms of outcome impact and cost-effectiveness. Combined, the results from both studies suggest that clinical benefit may accrue from care in units with protocol driven care and/or co-location with specialist neuroscience facilities (comprising not just neurosurgery, but also neuroradiology, neurorehabilitation and specialist expertise in critical care). It would be important for further studies to determine whether these two characteristics of care provide additive or overlapping benefits.

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