

AuSCR Research Task Group approved projects

Title	Pre-hospital stroke care: economic evaluation of the Melbourne Mobile Stroke Unit
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AuSCR role	Data provision and survey
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Status	In progress

Summary The Melbourne Mobile Stroke Unit (MSU) is an Australian first that provides a specialist ambulance service for suspected stroke directly to patients in the community. The MSU has a multidisciplinary team including a neurologist, nurse, radiographer and two paramedics, as well as the facility for immediate brain imaging with a portable CT scanner. This enables pre-hospital assessment, imaging and provision of time-critical treatments prior to arrival at hospital. The MSU commenced providing ambulance services from November 2017. Preliminary evidence indicates that patients treated by the MSU receive treatment substantially faster compared to national averages. In 4 months of operation, the MSU was dispatched to n=476 cases and n=209 patients were attended. A total of n=105 (50% of attended) received a diagnosis of suspected or definite stroke; n=110 (53%) received MSU CT imaging. Among those with confirmed ischaemic stroke, 22 (41%) received intravenous thrombolysis, with median scene-to-CT 21 mins, scene-to-needle 41 mins, and onset-to-thrombolysis 111 mins (30% within 90 mins of stroke onset), substantially faster than Australian averages of 27 mins, 72 mins and 156 mins, respectively. Pre-hospital triage allowed bypass of primary stroke centres for comprehensive or neurosurgical centres in 17 patients (16% of all strokes). Additional pre-hospital treatments on the MSU have included anticoagulation reversal, blood pressure management and intubation for airway management. The use of this type of ambulance is a first for Australia. It remains unclear whether this type of specialist ambulance service is cost-effective and would be worthwhile in other locations.

In this project, we will undertake a comprehensive data linkage study to determine the cost-effectiveness of the MSU using primary data from the MSU, and datasets from the Victorian Department of Health and Human Services, Ambulance Victoria and the Australian Stroke Clinical Registry to guide policy.

Data on patients treated in the MSU are collected prior to hospital arrival and during the hospital stay for quality assurance purposes. These patients are followed up to assess outcomes after stroke. Data collected on equivalent patients treated with standard ambulance services may be accessed through Ambulance Victoria and the Australian Stroke Clinical Registry (AuSCR; clinical processes of care in hospital and patient reported outcomes at 90 days). We will link patient-level MSU data with the Victorian Emergency and Admitted Episodes Minimum Datasets (Victorian Department of Health and Human Services), as well as data from Ambulance Victoria and the AuSCR. The merged data will be analysed to compare the patients treated in the MSU with patients treated via standard ambulance services. MSU operating cost data will also be sourced. To assess the costeffectiveness of the MSU compared to standard ambulance services we will undertake: (1) a historical-control comparison where patients with suspected stroke in the 12 month period before the MSU commenced will be compared to those in the first 12 months of MSU operation; and (2) a contemporaneous case-control study of patients treated when the MSU was available compared to equivalent patients unable to be treated when the MSU was unavailable during the first 12 months. These data will be summarised and sensitivity analyses performed.