Victoria's trauma care system: national implications for quality improvement

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Progressive reduction in trauma mortality and morbidity demands both peer-group and state registry evaluations, with ensuing recommendations implemented by a responsive state government trauma committee

Between 1992 and 2005, the Consultative Committee on Road Traffic Fatalities in Victoria (CCRTF) conducted several studies evaluating trauma care delivery and management in consecutive victims of road traffic accidents who had received medical treatment but subsequently died.[1-4] These studies found that, between 1992 and 1997, combined preventable/potentially preventable (P + PP) death rates* among patients who died after road accidents were unaltered (* respectively, survival prospects with optimal treatment assessed as ⩾ 75%, and as 25%–74%).[1,5] Similarly, the frequency of errors and deficiencies contributing to death was unchanged. In 1997, recommendations were made to reduce identified problems[6] and, in response, the Victorian Government established a Ministerial Task Force on Trauma and Emergency Services to implement a statewide integrated trauma system to expedite early definitive care.[7]

Previously, while there had been one adult major trauma service (MTS) in Victoria (The Alfred Hospital), most patients were taken to their nearest public hospital, where P + PP death rates were two to three times higher than at the MTS.[3]

The statewide integrated trauma system, developed in stages from 2000, has a four-tiered structure, with public hospitals assigned to different service levels according to the complexity of care they provide.[7] Implementation of the statewide trauma system involved the development of two additional MTSs in Melbourne (a second adult hospital managing a sufficient caseload of seriously injured patients, and a paediatric hospital) and the designation of 11 metropolitan hospitals, 9 regional hospitals and numerous primary injury services in small rural communities.

Under the integrated system, major trauma patients are identified at the scene of injury according to specified anatomical, physiological and mechanistic criteria and transported to an MTS, provided that the anticipated transport time from the scene of injury will not exceed 30 minutes.[7] Longer times are accepted for patients who are managed and transported by Advanced Trauma Life Support helicopter crews. Otherwise, the patient is triaged to the nearest designated hospital and, after resuscitation, stabilisation and communication with the hospital, transferred to an MTS if appropriate. Early communication with the hospital from the scene of injury facilitates immediate patient reception by a trauma team. The team is comprised of at least one emergency medicine consultant and surgical and anaesthetic registrars, with a consultant general surgeon attending within 20–30 minutes for time-critical patients. Directors of trauma services are accountable for improved management in the hospital through coordination, audit and feedback. The Victorian State Trauma Registry, established in

2001, monitors and reports on progress to the State Trauma Committee, which is responsible to the Minister for Health.[8]

In a recent study, the CCRTF compared management and outcomes of 245 consecutive road traffic fatality cases before (1997–1998) and 193 consecutive cases after (2002–2004) the implementation of the integrated trauma system.[4] The proportion of these trauma patients with TRISS (Trauma and Injury Severity Score)[9] survival prospects of ⩾ 75% who subsequently died fell from 31% before to 22% after the introduction of the new trauma system. The proportion of major road trauma victims admitted to MTSs increased from 34% to 62%. More patients were attended by Advanced Trauma Life Support road and helicopter paramedics, with increased time spent by paramedics at the scene of injury and increased transport times. The per-patient number of deficiencies and errors contributing to death was significantly reduced overall, particularly in the emergency department. P + PP death rates fell from 36% to 28% (preventable deaths from 5% to 3%, and potentially preventable deaths from 31% to 25%). While P + PP death rates remained markedly lower at MTSs than at other hospitals, P + PP death rates before hospital arrival and within each of the four hospital groups did not significantly change. The overall reduction in P + PP mortality can largely be attributed to increased admissions to MTSs.

Recently, the Victorian State Trauma Registry estimated that there was a 37% reduction in the likelihood of death among hospitalised major trauma patients in 2002–2006 compared with 2001–2002.[8] This finding, supported by research by Cameron and colleagues reported in this issue of the Journal (*page 546*),[10] is further evidence of overall improvement following introduction of the new trauma system.

In response to the lack of improvement within each hospital group, the CCRTF established an interactive strategy with the trauma services. Based on the most recent CCRTF findings, consensus recommendations to counter ongoing system and clinical deficiencies were developed jointly with each trauma service.[11] Persisting deficiencies in the Victorian system include the lack of Trauma Director/Coordinator appointments at many hospitals; failure to ensure compliance with protocols and guidelines; delays in communication and referral; insufficient intensive-care beds; and problems with coordination, audit and feedback.[11] In addition, funding for independent peer-group review of trauma mortality has ceased.

Panel studies (involving multidisciplinary peer-group evaluation of patient management), trauma registry data and population-based research indicate that mortality and morbidity are reduced following the introduction of integrated trauma systems and that continuing improvements can be achieved.[12-15] Statewide trauma systems operate in all jurisdictions in Australia except for Tasmania, the Northern Territory and Western Australia (where one is pending). Independent peer-group review is currently limited to New South Wales, where some fatalities, pre-hospital care and interhospital transfer cases are evaluated. NSW and Queensland have state trauma committees. Key system weaknesses recognised by the state trauma committees of the Royal Australasian College of Surgeons include MTS caseload dilution in NSW following the development of 12 MTSs; lack of consultant staff attendance for the early management of severe trauma and critical decision making in NSW and South Australia; insufficient surgical and intensive-care beds in the Australian Capital Territory; and deficiencies in theatre access and lack of intensive-care beds and funding in Queensland.

Although the initiation of statewide trauma systems in Australia has been a major advance, it is still awaited in three jurisdictions. The number of MTSs designated should allow sufficient caseload of severe injury at each MTS.[16] Future quality improvement requires identification of ongoing deficiencies so that targeted countermeasures can be introduced and their effectiveness assessed. Identifying such deficiencies depends on continuing analysis of trauma registry data, complemented by independent peer review of preventable mortality to clarify factors contributing to death. Effective oversight by a state trauma committee is mandatory to ensure an adequate response to the findings of the audit process and to implement corrective actions. Meetings between audit personnel and hospital staff would further facilitate quality improvement. The creation of a national trauma council would help to coordinate and develop standardised quality assurance and improvement in trauma care delivery across all Australian states and territories. Finally, quality improvement remains dependent on the commitment of consultant staff to direct all phases of trauma care.

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