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LETTER TO THE EDITOR

A vision to optimise Victorian rural trauma care

> The secret of change is to focus all of your energy not on fighting the old, but on building the new—
>
> Dan Millman, Way of the Peaceful Warrior, 1980[1]

Major trauma patients have improved mortality and rates of morbidity when managed in a major trauma service (MTS).[2] In Victoria, major trauma patients within 45 min of a MTS are transferred direct from the site of injury, and others usually in rural or isolated areas are first assessed and stabilised in local emergency departments (ED). Regional trauma services are often led by general surgery, or acute surgical units (ASU) and managed by ED with varying levels of experience with major trauma. As such, rural populations have significantly higher rates of injury-related hospitalisation and death compared with urban areas.[3] Emerging technologies and policy improvements may offer support to clinicians to improve local management of injured patients.

Decisions to transfer patients to the nearest hospital or MTS are made rapidly by Ambulance Victoria (AV) based on criteria defined by the Victorian State Trauma Service (VSTS), considering vital signs, injury severity and mechanism of injury.[4] These transfers are centrally coordinated by Adult Retrieval Victoria (ARV), with speed and efficiency being key for optimal patient outcomes.[5] However, all Victorian MTSs are in Melbourne. This presents significant barriers for rural trauma patients, particularly when considering distance required to transfer—as towns on the periphery of the state such as Swan Hill are over 300 km from Melbourne. Air transfer to a MTS is used to overcome this barrier, yet this can be affected by weather conditions, airport infrastructure and a significant turnover time for fixed-wing aircraft deployment.[6] This emphasises the importance of well-resourced rural general surgical units, as not all patients are suitable for, or are able to be transferred and will therefore need to be managed within the rural setting.

On arrival to the ED, patients are assessed and stabilised by emergency and surgical teams. Subsequently, the patient is either admitted under general surgery or transferred to an MTS if criteria are met.[4] Further investigation and management are largely dependent on the nature of the trauma. The availability of resources to provide high-quality trauma care such as blood products, advanced imaging modalities, as well as specialised surgical and anaesthetic equipment can vary widely between rural hospitals. This is further compounded by variability in consultant experience and confidence in managing traumatic injuries and the fact that rural services do not have local access to surgical subspecialties such as cardiothoracic surgery or neurosurgery. More sophisticated telehealth platforms could enable rural hospitals to access specialist support to co-manage trauma with MTSs when safe to do so, similar to the Victorian Stroke Telemedicine (VST), which has been used to good effect since 2010.[7] Additionally, integration of artificial intelligence (AI) with the electronic medical record (EMR) could enhance the seamless transfer of patient information, including imaging, real-time vitals, investigation results and live updates, to consulting specialists.[8] This integration enables continuous collation and transfer of relevant up-to-date clinical data, providing a succinct and dynamic clinical picture that is crucial during inter-hospital transfers or remote consultations. Live updates ensure that specialists have the most current information, enhancing decision-making and patient management; however, a limiting factor is the lack of a robust EMR in regional or rural centres.

Following acute care, access to rehabilitation is just as important in the recovery phase and transition to work, as approximately 17% of trauma patients require admission to inpatient rehabilitation facilities to regain function.[9] Access is often limited and sometimes inaccessible in rural areas due to high demand and a lack of services. As a result, patients may need to stay in hospital longer for in-hospital rehabilitation or travel longer distances to access outpatient care. Both options result in greater financial costs to the patient and health care system, as well as significant social stress to families. This highlights the urgent need for more allied health and medical practitioners in rural areas and improved access to care. A potential solution lies in expanding the use of telehealth platforms, which can offer safe and accessible rehabilitation,[10] effectively bridging the gap in health care delivery for rural communities.

In planning for discharge or stepdown care, hospital staff can spend significant time undertaking administrative tasks—such as back-and-forth phone calls with stepdown locations due to the limited bed availability. Therefore, lessons could be learned from the current inter-hospital trauma transfer process, which is centrally coordinated by

ARV. The viability of a region-centric coordination of step-down transfers with the aim of reducing administrative tasks and increasing transfer efficiency could be explored. This approach could help rural patients return home sooner while also ensuring that beds awaiting discharge are swiftly made available for patients with higher acuity needs.

In conclusion, while MTSs in Victoria are highly effective in improving patient outcomes, significant challenges remain for rural trauma patients who face geographic and resource-related barriers. Regional trauma care providers must contend with limited access to specialised care and advanced resources, highlighting the need for targeted improvements in rural health care infrastructure. Looking towards the future, emerging technologies such as telehealth and AI integration offer promising solutions to bridge the gap between rural and metropolitan trauma care. Furthermore, enhancing access to rehabilitation services and exploring centralised coordination for step-down care can improve the overall efficiency and quality of trauma management in rural areas. By addressing these disparities, Victoria can ensure that all trauma patients receive timely and effective care regardless of location.

AUTHOR CONTRIBUTIONS

Connor Bentley: Conceptualization; investigation; writing – review and editing; writing – original draft. Gavin J. Carmichael: Conceptualization; investigation; writing – review and editing; writing – original draft. Joshua G. Kovoor: Conceptualization; investigation; writing – review and editing; writing – original draft. James S. May: Conceptualization; investigation; writing – review and editing. John Kefalianos: Conceptualization; investigation; writing – review and editing. Joe Ibrahim: Conceptualization; investigation; writing – review and editing. Thiep Kuany: Conceptualization; investigation; writing – review and editing. Yasser Arafat: Conceptualization; investigation; writing – review and editing, supervision. Mathew O. Jacob: Conceptualization; investigation; writing – review and editing, supervision.

CONFLICT OF INTEREST STATEMENT

None declared.

DATA AVAILABILITY STATEMENT

Data sharing is not applicable to this article as no new data were created or analyzed in this study.

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