Integrated critical care: an approach to specialist cover for critical care in the rural setting

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Critical care encompasses elements of emergency medicine, anaesthesia, intensive care, acute internal medicine, postsurgical care, trauma management, and retrieval. In metropolitan teaching hospitals these elements are often distinct, with individual specialists providing discrete services. This may not be possible in rural centres, where specialist numbers are smaller and recruitment and retention more difficult. Multidisciplinary integrated critical care, using existing resources, has developed in some rural centres as a more relevant approach in this setting. The concept of developing a specialty of integrated critical-care medicine is worthy of further exploration. **(MJA 2003; 179: 95-97)**

IN AUSTRALIA, "rural" centres have been defined statistically as local areas where most of the population resides in centres of 10 000–99 999 people, and "remote" centres where the population is less than 10 000 people.[1] It has been claimed that a two-tiered system of hospitals has developed, one tier composed of "centres of excellence", and the other of hospitals more limited in their range of expertise and technology.[2] The first tier is predominantly hospitals in the heart of capital cities, while rural hospitals fall into the second tier.

In this hierarchical system, metropolitan teaching hospitals are often perceived as setting the standards for practice, but this perception can be challenged. Standards are sometimes based as much on opinion as evidence and are not necessarily universally applicable.[3] It has been questioned whether a resource-intensive intervention should become a standard of care if it produces a small benefit in clinical outcome in trials in large institutions, when a greater benefit may be gained by giving a greater number of patients a more basic minimum standard of care that is sustainable across the entire healthcare system.[4] Metropolitan tertiary hospitals provide a super-specialised level of care that is essential for some patients, but not sustainable outside resource-concentrated centres. On the other hand, rural base hospitals and metropolitan district hospitals provide a broad spectrum of hospital and community medicine, and therefore training opportunities, that may no longer be available in major tertiary hospitals.[5] With respect to hospital practice, then, it could be argued that it is the second-tier hospitals that currently deliver the generic standard of care.

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Part of the problem with rural healthcare systems is that models of care applied to super-specialised metropolitan practice are assumed to be relevant to rural practice. A different level of care does not necessarily equate with a lower *standard* of care. Indeed, structuring resources to match the specific rural milieu may well lead to more appropriate care for this setting and therefore better care.

Wakerman and Humphreys[6] suggest that a distinctive "rural health" approach is needed because rural Australia is sociologically, culturally, economically and spiritually different from metropolitan areas, and that a hallmark of rural and remote healthcare is innovation generated by local need and community action.[6] This approach has been successfully applied in a number of rural centres to the problem of providing critical-care services in the face of limited numbers of medical specialists.

Medical specialist involvement in rural intensive care in Australia — the status quo

Recent reviews of intensive-care activity in Australia found that 37% of Australian public-sector intensive-care units[7] and 34.5% of medical specialists working in public-sector intensive care[8] were in rural and remote centres. The nature of the work in these units differs from that in metropolitan centres. Many are combined with high-dependency and coronary care, with over half the patients admitted being in these categories.[7]

The medical specialists involved also differ in their qualifications and background from specialists in major metropolitan hospitals, as training, recruitment and retention difficulties limit the number and type of specialists available in rural centres. Of the specialists currently involved in rural intensive care in Australia, only a small number have qualifications endorsed by the Joint Specialist Advisory Committee in Intensive Care (JSAC-IC).[8] Instead, the majority have backgrounds in anaesthesia, emergency medicine, general medicine and/or general surgery and have acquired expertise in intensive-care medicine through specific training, clinical practice, or both.

In addition to their base discipline, many specialists are also involved in other phases of critical care. Traditionally,

this multiskilling has developed out of necessity. Increasingly, however, it is occurring by choice, as it can result in efficient use of skills and afford a unique and interesting casemix for specialist medical staff, while at the same time providing benefits to critically ill rural patients and rural communities.

Models of integrated critical care

Trunkey[9] proposes that physicians and surgeons are evolving towards three types of practice: ambulatory care, hospital-based practice and intensive care. We suggest that the third branch is actually *critical care*. Critical-care medicine is the multidisciplinary healthcare specialty that incorporates the knowledge, skills, attitudes and problem-solving abilities required for the recognition and early management of patients with acute life-threatening illnesses and/or injuries.[10,11] It encompasses elements of emergency medicine, anaesthesia, intensive care, acute internal medicine, postsurgical care, trauma management and retrieval medicine. Clearly, critical care is a continuum that begins at the onset of critical illness or injury, and continues through the transportation process and the acute hospital care process.[12,13]

The principles for managing critical illness and injury are similar, regardless of patient location or diagnosis. The aim is to keep alive those patients who have a reasonable chance of survival.[14] In rural Australia, this may require organisation of resources in a fashion that is different from that undertaken in metropolitan centres. In metropolitan hospitals, subspecialists would be involved in each phase of the management process, but this may not be possible in rural centres, where specialist numbers are smaller. This is where a multidisciplinary critical-care physician becomes particularly valuable. This specialist has many of the characteristics that have recently been attributed to those of a "hospitalist".[2,15]

Through local innovation and necessity, models for effectively delivering critical care using existing resources have been developed in several sites in rural Australia, including Tamworth Base Hospital and Port Macquarie Base Hospital in New South Wales. These models of integrated critical care (see Box) involve a hospital-wide approach, acknowledging that care of critically ill patients is a collaborative endeavour, not the exclusive domain of an intensive-care unit. The critical-care facilities are located nearby and share specialist medical staff, resident medical staff, career medical officers and nursing staff.

Integration has resulted in a more seamless interface between the various phases of critical care and between the respective disciplines. Although multidisciplinary and multiskilled, individuals are not required to perform multiple tasks at any given time — for example, when on duty in the critical-care unit, they are not given other responsibilities. Rather than being partisan about individual specialty groups, the focus has been on providing the most appropriate services to meet the needs of critically ill patients and their rural communities, using the most appropriate resources.

Features of integrated critical care

- Multiskilled critical-care specialists trained and experienced in the various aspects of critical care in rural hospitals.
- Multidisciplinary critical-care teams that provide:
  - a more seamless interface between the various phases of critical care and between its respective disciplines;
  - a rapid response to, and a continuum of care for, critically ill and injured patients;
  - clinical leadership in evaluating and managing critically ill and injured patients, both in the hospital (including the emergency department, critical-care unit and hospital wards) and in the community (including retrievals, and support for ambulance crews, peripheral hospitals and general practitioners); and
  - training of medical students, medical staff, nursing staff and allied health professionals to recognise and provide a systematic approach to critical illness and injury.
- Team members who are empowered to work beyond perceived traditional boundaries, but within the realms of their clinical expertise and credentials, to enable the best use of available resources.

Thus, these successful models are based on cooperation rather than competition or duplication. This was recognised in the 2001 NSW Government Action Plan for intensive-care services.[16] The Plan recommended that, in rural hospitals, a formal working relationship be developed between staff of the intensive-care unit and anaesthetic or emergency-department consultants to provide appropriate senior medical cover for the unit.[16]

A collaborative approach for the future?

Currently, there is no formal program for training specialists for multidisciplinary rural critical-care practice. Training in many of the relevant base specialties remains metropolitan-based with a metropolitan focus. For example, of the registrars working in Australian public-sector intensive-care units identified in a recent survey, only 3.7% were in rural and remote areas, and the majority of these were not JSAC-IC trainee registrars.[7] To address this disparity, a fresh approach may be required.

In rural and non-tertiary metropolitan centres, critical-care practice has characteristics that distinguish it from tertiary metropolitan practice. Integrated critical-care medicine could therefore be defined as "the practice of critical-care medicine that occurs in non-metropolitan Australia" and developed as a distinct specialty, with appropriate input from existing specialty Colleges and societies. Specialist training could be provided at appropriate rural sites rather than concentrated in tertiary metropolitan centres. Alternatively, strong subspecialty groups could be developed within existing Colleges, with a unifying cross-College standing committee and joint training.

Approaches to critical care vary throughout the world,[12,17-19] and a number of approaches tried elsewere may provide suitable models for integrated critical-care medicine in Australian rural areas. Whatever model is adopted, given the backgrounds of the majority of specialists currently involved in critical care in rural Australia, the

specialties of emergency medicine, anaesthesia and intensive-care medicine will need to lead the process. Like anaesthesia, emergency medicine and intensive-care medicine have significant clinical links, and these need to be encouraged and strengthened.[12,13,19]

Conclusion

To ensure high standards of critical care for rural patients, it is vital that realistic solutions continue to be developed that match the existing realities of rural practice. The integrated critical-care model has successfully provided quality services in a number of hospitals and offers potential for wider implementation in rural areas. The concept of developing a specialty of integrated critical care is worthy of further exploration. This will require collaboration and cooperation between all stakeholders.

Competing interests

None identified.

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