QEMS: The Queensland Emergency Medical System
A structural and organisational model for EMS in Australia
Authors:

Introduction:

Congestion of emergency health services in Australia has become a matter of prominence not only in the scientific literature but also in the public media. In addition recent major incidents such as the tsunamis in south Asia and the terrorist attacks in the USA, Europe and Bali, together with the threat of pandemic infectious disease, have highlighted the need for an organised approach to emergency health care.

However each day in Australia more than 17,000 people attend hospital Emergency Departments and over 7,000 are treated and transported by ambulance services (1). There has been no single emergency event in Australian history which goes close to replicating this daily burden of acute illness and injury. Appropriate management of this daily workload is critical to addressing not only the current challenges but also facilitates surge capacity in the event of all but the most catastrophic incidents.

The aim of this paper is to describe the Queensland Emergency Medical System (QEMS) and the structural and organisational arrangements which have been developed over the last fifteen years with a view to encouraging discussion regarding a more structured approach across Australia to system wide design, development, monitoring and evaluation for emergency health services.

The term Emergency Medical System (EMS) originated in the USA in the 1960s. There are variations in the terminology (Emergency Medical Services and Emergency Medical Services System or EMSS) and in the scope implied by the name. In some circumstances the term is restricted to pre-hospital care and in others to the whole

emergency health service system. This leads to debate amongst health professionals. Many correctly believe that the system is not a ‘medical’ system but rather a ‘health care’ system however, this debate arguably detracts from the essential principle of a ‘systematic’ approach to coordinating acute health crises.

Background:

The demand for emergency health care is increasing both in total numbers of patients and the complexity and severity of presenting conditions (1). At the same time the expectations of the community regarding quality and timeliness of care have increased. The real burden of acute illness and injury is difficult to estimate although the 2006 National Health Survey identified that 18% of people had suffered an injury in the preceding four weeks (2), which equates to almost 26,000 injury-related incidents per day throughout Queensland alone. Optimal management of these patients requires systematic organisation and coordination with the capacity to expand in the event of a rare major incident.

Systematic approaches to emergency health care have their origin in combat environments where the sudden imposition of large numbers of casualties requires an organised and systemic approach (3,4). Adoption of these principles into the civilian community occurred with the establishment of civilian ambulance services in the late 19th Century although until the late 20th century the development of these services focussed more on transportation improvements rather than clinical care.

The 20th Century was also characterised by the evolution of medical care with gradual withdrawal (or exclusion) by General Practitioners from hospital based care and in particular~~ly~~ emergency health care. During the 1980s and 1990s, Hospital Casualty

Departments were transformed into Emergency Departments and a new medical specialty of Emergency Medicine followed the creation of the Australasian College of Emergency Medicine (ACEM) in 1983 (5). Hospital based medical retrieval services developed in association with new helicopter rescue services and fixed wing aero-medical services, which began with the formation of the Royal Flying Doctor Service (RFDS) in Cloncurry Queensland by the Reverend John Flynn in 1928 (6), expanded throughout Australia.

The majority of these developments occurred through individual initiative rather than coordinated policy. In the USA a more coordinated approach to policy development began in the 1960s following the publication of the landmark article “Accidental death and disability: the neglected disease of modern society” (7). This seminal paper led to the introduction of national EMS legislation and to the establishment of EMS systems throughout the USA.

Emergency Medical Systems have been characterised into two broad categories; the *Anglo-American model* of delegated medical care to paramedics and the *European* model of hospital based medical retrieval (8). To these basic models may be added by natural extension, the *Neglect* model in which communities have not embraced enhanced emergency health care and the *Mixed model* in which various elements of the two models apply.

The Queensland Emergency Medical System

The Emergency Medical System in Australia contains diverse elements which include:

- Public and private hospital Emergency Departments
- Domestic and international medical retrieval services

- Publicly funded ambulance services
- Aeromedical services; fixed and rotary wing.
- Primary health care
- First aid and first responder services.

While historically these services have collaborated to some extent, there are a number of factors which are currently driving a need for a more systematic approach. Some of these factors include the increasing complexity and specialisation of medical care, the growth in service providers, the development of private hospital Emergency Departments, the evolution of aero-medical services, and the involvement of the community and volunteers in first response and first aid.

In 1990, a Joint Parliamentary Select Committee (PSC) of Enquiry in Queensland recommended the formation of state level liaison Committee to be known as the Emergency Health Services Advisory Committee (EHSCAC). In effect, this was the first EMS committee for Queensland. The Committee was renamed in 1997 as the Queensland Emergency Medical System Advisory Committee (QEMSAC) to give direction to the implementation of the Queensland Emergency Medical System (QEMS) policy framework which had been developed by EHSCAC and approved by the Queensland Cabinet.

The development of QEMS sought to address the fragmentation and associated challenges to system coordination and to provide government with a statewide perspective of the needs of the community to enable comprehensive planning. ~~This coordinated approach has reflected the development of a coordinated approach to~~

~~emergency services in the State through the formation of an integrated Department of Emergency Services in 2004 encompassing Ambulance, Fire and Rescue Services and counter disaster response.~~

The conceptual model for QEMS is outlined in Figure 1. The model demonstrates the association between service provision by community response, primary emergency health care and hospital emergency departments which in turn are supported by operational and policy coordination, education, research, data and quality control. It is this coordinated system of emergency health which in turn provides the basis for disaster preparation and response.

The possible advantages of a system-wide approach include improved coordination and streaming of clinical care, maximisation of the available resources, avoidance of duplication, standardisation of control and communication, dispersal of patients to an appropriate source of ongoing care, support for rural and remote areas, and maximisation of life saving new technology.

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~~Achievements~~ Development of QEMS

~~In the 10 years since the implementation of~~ QEMS~~,~~ initiatives have focussed on the five principal domains of community, pre-hospital care, hospital care, aero-medical and disaster management.

~~Several key strategies have increased the awareness of the community of the social impact of emergency health, increased the rate of first aid education, improved first aid service provision and develop first responder programs. Queensland Ambulance Service established a community based first responder program in 2005 to provide first response~~

particularly in some rural communities and outer urban areas. The cooperative approach arising from the QEMS framework has led to greater cooperation between first aid organisations and professional ambulance services in providing first aid instruction and a tiered and effective community response. (9)

Professional **pre-hospital** care includes both primary health care and the Queensland Ambulance Service. Many patients attend their General Practitioners with acute illnesses and minor injuries. Others call for the assistance of the ambulance service. The Queensland Ambulance Service (QAS) provides state-wide coverage and Queensland's public hospitals also provide limited ambulance services in small remote and rural communities. During the last 15 years,The QAS has undergone a massive modernisation and upgrading of all elements of the service including the introduction of paramedics and the transition from vocational to tertiary education. An integrated communication and coordination infrastructure featuring computer aided dispatch has been established through a network of Communication Centres

Fixed wing **aero-medical services** have been progressively transferred to the responsibility of the Royal Flying Doctor Service (RFDS) which now operates a statewide network of 12 aircraft from eight bases across Queensland. The state also has developed an extensive helicopter network with 12 helicopters operating from nine bases. In 2005,C centralised statewide clinical coordination has been implemented for the coordination of patient retrieval and transfer. The Queensland Emergency Medical System Clinical Communications (QCC) system coordinates all aeromedical activities within the state and monitors the location and availability of aeromedically configured aircraft. The QCC also provides medical advice and coordination of resources across the system for neonatal, paediatric, obstetric and adult retrieval and interfacility transfer.

The development of hospital **Emergency Departments** has built on the development of Emergency Medicine as a speciality. ~~Emergency Departments are categorised according to the Clinical Services Capability framework for public and private hospitals in Queensland.~~ Hospital Emergency Departments also provided retrieval and transfer services for patients although dedicated retrieval services are now provided by CareFlight Medical Services, These complement those provided by community rescue services, Queensland Rescue and the QAS.

The health response to **disasters, mass gatherings, major incidents or events** requires a coordinated approach along with standardised operating procedures to facilitate maximum inter-operability between agencies and ensure efficiency and effectiveness. In 2005, the QEMS framework provided a platform for the development of the State Health Emergency Response Planning Framework (SHERP). The SHERP framework identifies the core command and control arrangements and provides a planning model for event/incident response.

~~Complementing these domain improvements have been **system-wide initiatives**. In 2005 a dedicated QEMS Clinical Coordination Centre (QCC) was established. The QCC provides medical advice and coordination of resources across the system for neonatal, paediatric, obstetric and adult retrieval and inter-facility transfer.~~ In 2001 QEMSAC initiated a project to review the management of trauma across the state. This project was conducted through the Australian Centre for Pre-hospital Research with financial support from the Motor Accident Insurance Commission (10). The resulting “Trauma Plan for

Queensland" has been endorsed by the Queensland Government and funding of $28.4 million over four years provided for implementation.

Quality review of the system is one of the responsibilities of the consultative mechanisms outlined above. In 2006 a QEMS Quality Council was formed to monitor clinical outcomes within QEMS. The Quality Council has successfully negotiated uniform arrangements for adverse incident reporting and analysis with a focus of further development in QEMS of a patient-centred continuous improvement culture.

Challenges for the future

Despite these initiatives, EMS nationally and internationally has a number of ongoing challenges to face.

- **Sustainable workforce.** Workforce shortages cause major difficulty across the system. QEMS provides a framework for a more strategic approach to managing workforce including better planning for traditional supply as well as the development of innovative new models and changes to existing scope of practice.

- **Education** across the system remains fragmented and lacking a degree of consistency and focus. There are few opportunities for shared educational opportunities between disciplines. A more organised and coordinated approach to development of educational initiatives including disaster exercises would provide more effective and efficient outcomes.

- **System-wide congestion** is causing considerable distress to both patients and staff. Congestion is caused by increasing demand, lack of trained personnel and barriers to accessing inpatient beds for patients requiring hospital admission.

A sound **evidence base** is necessary for future system development and for continuous improvement in quality of health care. A more coordinated approach to data collection and an associated research effort would provide an evidentiary platform for strategic development and evaluation of the system.

Discussion

In the Australian socio-political environment it is not possible to ensure complete control of system development. Developments arise often through isolated initiative; some of these are helpful whilst others may be contrary to the broad strategic direction. Enthusiasm for restructure and reform in isolated components of the system in the absence of a broad strategic vision can result in further dislocation rather than improved coordination.

~~The creation of an organised approach to policy development will never control this entirely; nor should it. Often the most innovative solutions arise from individual creativity. However, sometimes those initiatives have unintended consequences on the system as a whole and mechanisms for independent measurement of their impact are currently limited.~~

~~There is value in a mechanism which influences core initiatives and which otherwise monitors the system and seeks to make best use of the initiatives which do occur. The~~

~~intent is not to centrally control the system but rather to provide a forum for discussion and development of a policy framework within which organisations may develop.~~

The benefits of the standardisation of trauma and disaster responses within Australia are now generally well accepted. Most Australian States and Territories have disaster plans in place for the management of multi-casualty events and structures are in place to ensure national coordination. However the implementation of an Emergency Medical System with the capacity to oversight and coordinate the management of significant events is critical to the efficient cross-portfolio deployment of resources and maximised patient outcomes.

This paper has described the experience in Queensland with the systematic approach to EMS development. It has not been possible to fully evaluate the impact of these changes although ~~These developments have on all~~ anecdotal evidence of improved individual outcomes is widespread. ~~the outcome for patients but the complexity of the system is such that system-wide evaluation is difficult.~~

The development of the QEMS policy framework has provided an opportunity to improve the strategic development of Queensland's emergency medical system and to ensure a patient focussed coordinated system of care. The system provides an extensive infrastructure for management of acutely ill patients on a daily basis which is available for ~~. This same infrastructure is then available for~~ rare major domestic incidents and to provide assistance internationally in times of major crisis.

This strategic approach offers a model for such arrangements in other states of Australia. We hold the view that the Council of Australian Governments should require

each state to maintain an EMS committee so as to provide a framework for coordinated and collaborative approach to system development. These state committees should have a broad portfolio of responsibilities and ~~but serve to~~ provide leadership and direction to the development of EMS and to ~~ensure~~ensuring c~~c~~oordination and quality of outcomes. A national EMS committee with broad representation and scope should also be established. The national EMS committee would integrate the activities of the variety of agencies responsible for EMS development and provide an integrated approach to daily emergency health system issues as well as to the coordinated response to major health incidents.

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Figure 1 Conceptual model of Australian Emergency Health Management