

# Victoria's critical care services Strategic directions 2007–12

Background paper

Intensive care stakeholder workshop

22 March 2006



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Improving the health, wellbeing and quality of life for Victorians  
through improving critical care and access in Victoria's public hospitals.

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## 1. Introduction

The purpose of this paper is to provide background information for stakeholders attending an intensive care workshop to be undertaken by the Department of Human Services (the department) in March 2007. The workshop will form part of a range of consultations with stakeholders to inform development of an intensive care policy framework by the department in partnership with the Intensive Care Advisory Committee (ICAC) in 2007. Engagement of critical care stakeholders including ICAC, medical and nursing critical care clinicians, health service management and departmental program areas will be undertaken to inform development of the policy and ensure the policy reflects key stakeholder issues. The policy framework will also be informed by reviewing relevant Victorian Government policy and initiatives, available literature and analysis of intensive care data.

The workshop is designed to:

- brief stakeholders on the proposed scope of the critical care policy
- identify key principles that should underpin delivery of intensive care services in Victoria's public hospitals
- discuss service delivery issues and challenges and identify possible best practice approaches across key themes such as service planning and models, system improvement, demand management, quality and safety, information and data management, technology, clinical leadership, workforce and performance monitoring.

Identifying key principles and best-practice approaches and strategies to address current critical care service delivery issues will be the key focus of the workshop.

## 2. Purpose of the policy framework

The purpose of the critical care policy framework will be to set a strategic direction to ensure the health system best meets the critical care needs of the community in the future. The proposed aims of the policy are to:

- ensure delivery of timely, accessible, safe and high-quality patient-centred critical care services
- support an integrated statewide critical care service system
- support continuum of care for critical care patients
- inform critical care service planning
- support efficient and appropriate utilisation of critical care resources.

The policy framework will identify key service directions for delivery of critical care services in Victoria's public hospitals from 2007-12, key principles that should underpin delivery of critical care services, key actions to be undertaken and an implementation timeline.

### 3. Draft key principles

The following draft key principles that should underpin the intensive care service system are proposed for discussion at the workshop:

- deliver timely and accessible care
- deliver safe, appropriate and evidence-based care
- deliver patient-centred care that is responsive to individual need
- provide an integrated critical care service system
- support integration of critical care with broader hospital services
- ensure supply of an appropriately trained workforce
- ensure efficient and appropriate utilisation of critical care resources
- utilise information technology and data management solutions
- support system improvement, innovation and research.

### 4. Proposed scope of policy framework

The proposed key focus of the critical care policy framework will be adult and paediatric services (intensive care units and high dependency units) in metropolitan, regional and rural public hospitals. The scope is expected to exclude neonatal intensive care services and stand alone coronary care units (CCU). The department is undertaking a review of cardiac care in Victoria's public hospitals in 2007.

The policy will consider the pre-transfer episode phase of critical care for patients who require a higher level of care to the extent that they impact on intensive care unit (ICU) services. It is recognised that effective working service relationships and expert capability in transporting critically ill patients is critical to ensuring a system level approach to improve access to critical care services. A Victorian adult emergency retrieval service framework is currently being developed as part of the review of the Victorian adult emergency retrieval service model undertaken by the department in 2006.

The policy framework will also consider the relationships and use of private intensive care services for delivery of care to public patients.

## 5. Role of the Department of Human Services

The department is responsible for planning and funding a wide range of services including health, community and housing services to diverse client groups across Victoria.

The Metropolitan Health and Aged Care Services Division of the department has responsibility for relations with, and performance management of, all metropolitan health and aged care services. The division also has statewide policy and program responsibility for acute health services, sub-acute services, mental health services and ambulance services.

The Statewide Emergency Program (SEP), Access and Metropolitan Performance Branch has program responsibility for critical care hospital access and care. The role of the SEP is to improve the capacity of the Victorian public sector to respond to, and actively manage, demand for critical care services across the Victorian public sector. SEP works closely with other departmental program areas and regional departmental offices to facilitate an integrated approach across the department to improve critical care and access in Victoria's public hospitals.

Improving critical care services in Victoria is consistent with the mission and objectives of the department, which is to enhance and protect the health and wellbeing of all Victorians, emphasising vulnerable groups and those in most need. The department's annual plan identifies the importance of building sustainable, well-managed and efficient human services, providing timely and accessible human services and improving safety and quality.

## 6. Role of the Intensive Care Advisory Committee

The Intensive Care Advisory Committee (ICAC) was established by the department in 2002 to provide advice and direction on implementing the recommendations resulting from the *Intensive care services review - planning for intensive care services* (2001). ICAC provides advice to the department on intensive care services in Victoria including:

- monitoring and advising on key ICU utilisation issues impacting on system capacity, and demand management
- providing advice on future service planning for intensive care services in Victoria
- monitoring quality and safety of intensive care
- providing advice on issues referred by the Victorian Intensive Care Data Review Committee (VICDRC)
- providing advice on standards, resources and equipment issues in Victorian intensive care services
- providing advice with regard to workforce issues in Victorian intensive care services
- advising on information management processes and systems, and other technologies that improve the quality, timeliness and relevance of intensive care services
- supporting regional critical care services and strengthening links between metropolitan and regional/rural critical care services.

In 2006-07, ICAC formed six working groups and has developed a workplan that outlines actions to be undertaken to progress key intensive care projects, facilitate service improvements and deliver best practice. In addition to providing expert advice for the development of the policy, ICAC will play a key monitoring role in its implementation.

## 7. Victoria's public hospital intensive care system

The following section provides commentary about intensive care service delivery in Victoria's public hospital ICUs. It is not intended to provide detailed analysis of ICU capacity, activity and utilisation, which will be undertaken as part of development of the policy framework.

### 7.1 Definition of an intensive care unit

Typically, critical care in Victoria's public hospitals is delivered primarily within a specialist unit within an acute hospital and includes intensive care beds supported by a variable number of high-dependency beds. Critical care areas have been traditionally divided into ICUs where the highest level of care is provided, and high dependency units (HDU). The HDU may operate independently from the ICU and may be speciality-specific, or have a close operational and geographical relationship with the ICU.

The Joint Faculty of Intensive Care Medicine provides the following definitions for ICUs:

- an ICU<sup>1</sup> is a specially staffed, and equipped, separate and self-contained section of a hospital for the management of patients with life-threatening or potentially life-threatening, and reversible or potentially reversible organ failure
- a tertiary paediatric ICU<sup>2</sup> or PICU, should be capable of providing comprehensive care including complex multi-system life support for an indefinite period to children less than 16 years of age – these units should have commitment to academic education and research and all patients admitted to the PICU should be referred for management to the attending intensive care specialist
- a HDU<sup>3</sup> is a specially staffed and equipped section of an intensive care complex that provides a level of care between intensive care and the general ward area and that typically patients admitted to HDUs will have single organ failure and are at risk of developing complications.

### 7.2 Designation of ICUs in Victoria's public hospitals

The level, range and role of intensive care services varies according to the size, location and role of the hospitals in which they are located. In Victoria's public hospitals, ICUs are designated as levels 1–3 broadly in line with classifications outlined in *Minimum standards for intensive care units* (Joint Faculty of Intensive Care Medicine, 2003) which define three levels of adult intensive care units according to three main criteria: the nature of the facility, the care process, clinical standards and staffing requirements.

<sup>1</sup> Joint Faculty of Intensive Care Medicine, 2003, *IC-1 Minimum standards for intensive care units*.

<sup>2</sup> *ibid*

<sup>3</sup> Joint Faculty of Intensive Care Medicine, 2002, *IC-13 Recommendations on standards for high dependency units seeking accreditation for training in intensive care medicine*.

- **Level 1:** A Level 1 ICU should be capable of providing immediate resuscitation and short term cardio-respiratory support for critically ill patients. It will also have a major role in monitoring and prevention of complications in 'at risk' medical and surgical patients. It must be capable of providing mechanical ventilation and simple invasive cardiovascular monitoring for a period of at least several hours. Providing such care for more than 24 hours is allowed for patients with essentially single-system failure but only within the context of ongoing discussion with a Level 2 or Level 3 unit with which the host unit has an established referral relationship. Such a relationship should include mutual transfer and back transfer policies and an established joint review process. All patients admitted to a Level 1 unit must be referred to the medical director of the unit or the specialist taking responsibility for the unit at the time of admission.
- **Level 2:** A Level 2 ICU should be capable of providing a high standard of general intensive care, including complex multi-system life support, which supports the hospital's delineated responsibilities. It should be capable of providing mechanical ventilation, renal replacement therapy and invasive cardiovascular monitoring for a period of at least several days. All patients admitted to the unit must be referred for management to the attending intensive care specialist.
- **Level 3:** A Level 3 ICU is a tertiary referral unit for intensive care patients and should be capable of providing comprehensive critical care including complex multi-system life support for an indefinite period. Level 3 units should have a demonstrated commitment to academic education and research. All patients admitted to the unit must be referred for management to the attending intensive care specialist.

### 7.3 Location of adult and specialist paediatric ICUs in Victoria's public hospitals

Intensive care service planning determines the provision, location and capacity of intensive care services across Victoria's population. Planning should reflect the appropriate capacity and function of intensive care services to best meet community need, ensure efficient and appropriate utilisation of intensive care services and improve service delivery.

In the Victorian public health system, adult critical care (intensive and high-dependency) services are provided through a statewide system of 23 critical care and 25 coronary care units. Level 3 ICUs are located primarily in metropolitan public tertiary referral hospitals and large regional hospitals. Paediatric intensive care services are located at the Royal Children's Hospital (RCH) and Monash Medical Centre (MMC) Clayton Campus. Capacity exists for metropolitan and rural ICU units to manage critically ill patients under 16 years of age for a short time, although the majority of critically ill children are cared for in the paediatric intensive care unit (PICU) located at RCH and MMC ICU, which has specialist paediatric capacity.

Figure 1 outlines the location and designation of ICUs in Victoria's public hospitals as identified on the critical care website ([www.health.vic.gov.au/criticalcare/ccu.htm](http://www.health.vic.gov.au/criticalcare/ccu.htm))

**Figure 1 Location, unit status and level of Victorian hospitals with an ICU.**

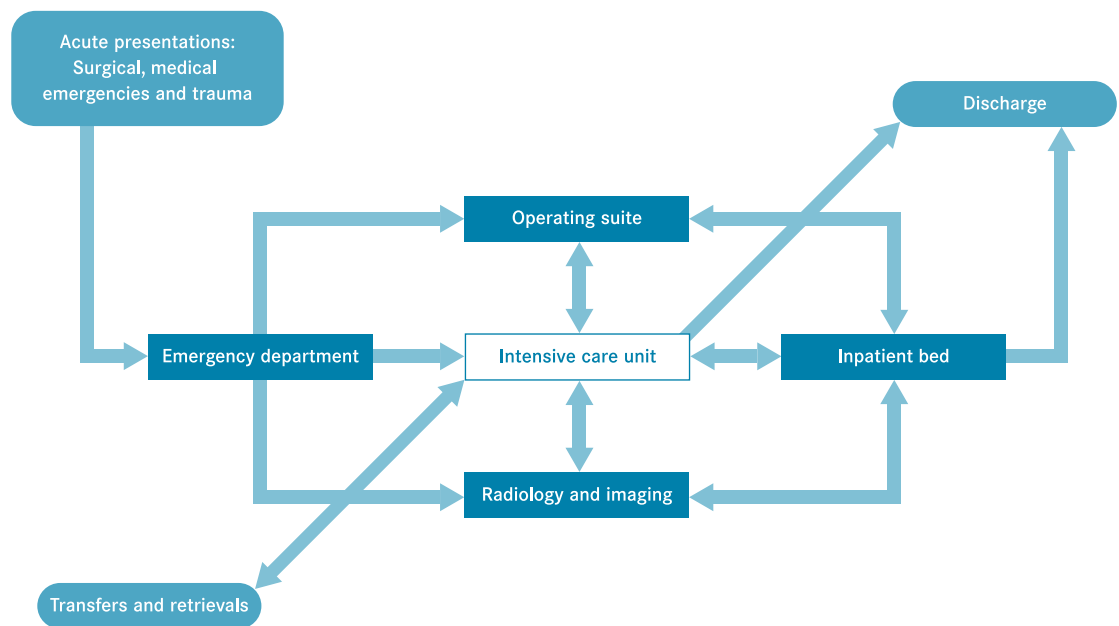
Location	Hospital/health service	Unit status	Level
<b>Metropolitan</b>	Austin Hospital	Adult ICU	3
	Box Hill Hospital	Adult ICU	3
	Dandenong Hospital	Adult ICU	2
	Frankston Hospital	Adult ICU	2
	Maroondah Hospital	Adult ICU/CCU	2
	Monash Medical Centre	Adult and Paediatric ICU	3
	Royal Melbourne Hospital	Adult ICU	3
	Royal Children's Hospital	Paediatric ICU	3
	St Vincent's Hospital	Adult ICU	3
	The Alfred	Adult ICU	3
	The Northern Hospital	Adult ICU	2
	Western Hospital	Adult ICU	3
<b>Regional</b>	Ballarat Health Services	Adult ICU/CCU	3
	Barwon Health	Adult ICU	3
	Bendigo Hospital	Adult ICU/CCU	2
	Central Gippsland Health Service	Adult ICU/CCU	2
	Goulburn Valley Health	Adult ICU/CCU	2
	Latrobe Regional Hospital	Adult ICU/CCU	2
	Mildura Base Hospital	Adult ICU/CCU	2
	Wangaratta District Base Hospital	Adult ICU/CCU	2
	Warrnambool Hospital	Adult ICU/CCU	2
	Western District	Adult ICU/CCU	2
	Wimmera	Adult ICU/CCU	1

## 7.4 Intensive care services as part of a broader system

Patients come to the ICU from a variety of sources. The *Draft monitoring intensive care: annual report 2004-05*<sup>4</sup> identifies that in 2004-05 approximately half of patients admitted to ICU came from the operating room, a quarter were admitted directly from the emergency department and around 15 per cent from general wards. A small number of patients (less than five per cent) were admitted from wards or ICUs of other hospitals.

Figure 2 presents a diagrammatic view of linkages between ICUs and broader hospital and health system.

**Figure 2 Linkages between ICUs and broader hospital and health system**



## 8. Collection of intensive care data in Victoria's public hospitals

Accurate up-to-date intensive care data and information management is required to inform critical care service planning and support improved access, demand management including during surges, and health service performance monitoring. Current available databases provide valuable information, although availability and usage is of variable quality. Key intensive care data sources in Victoria include:

### 8.1 Intensive care unit activity reports for Intensive Care Advisory Committee

Data sources currently utilised by the department to provide ICU activity reports for ICAC include:

- Victorian Admitted Episode Data (VAED) – provides episode level data such as length of stay, ventilated hours, sources of admission (elective/emergency)
- critical care bedstate website – provides bed status data such as ICU bed open/available, website update rates
- Victorian Adult Emergency Retrieval and Coordination Services (VAERCS): – provides a critical care bed stock coordination service monthly report on transfers and costs of public critical care patients treated in the private sector.

### 8.2 Critical care bedstate website

The critical care bedstate website was established in response to recommendations outlined in *Planning for intensive care services in Victoria* (2001). The website is hosted by St Vincent's Hospital. The objectives of the website are to:

- improve access to ICU beds by providing system-wide information on real time data on the availability of ICU beds
- provide hospitals and the department with aggregate data on the number of beds open.

Existing issues have been identified with the critical care website including poor update rates resulting in out-of-date information, inadequate data specificity making it difficult for clinicians to link patients to appropriate bed resources and inconsistent interpretations of data definitions.

### 8.3 Australian and New Zealand Intensive Care Society

The Australian and New Zealand Intensive Care Society (ANZICS)<sup>5</sup> is a professional and advocacy body for medical practitioners specialising in the treatment and management of critically ill patients. ANZICS's aims include ongoing professional education, providing leadership in medical settings, clinical research and analysis of critical care resources.

ANZICS is responsible for managing the Adult Patient Database (APD), the Paediatric Intensive Care Registry (ANZPIC) and the ANZICS Research Centre for Critical Care Resources (ARCCCR). These activities are overseen by the ANZICS Database Management Committee. This work is funded by grants from all state and territory health departments and the Ministry of Health (New Zealand) based on an agreement at the Australian Health Ministers' Advisory Council.

The ARCCCR produces an annual report about the characteristics and activity of Australian and New Zealand ICUs, based on the result of an annual survey conducted by ANZICS. The report is intended for intensive care staff, public and private health care providers, policy makers, and statutory bodies.

ANZICS surveys all Australasian ICUs yearly. The *Intensive care resources and activity: Australian and New Zealand 2003-05* report was based on survey responses from 98 public sector ICUs and 41 private hospital ICUs (based on the 82.56 per cent of Australian ICUs who responded fully).

The report focuses on the distribution and features of critical care units, medical and nursing workforce data, as well as selected quality indicators. The report includes:

- the number of admissions to ICU
- hours of ICU care
- mechanical ventilation hours
- medical, nursing and allied health staffing profiles.

Data from the APD is used for a number of intensive care service research projects, and in Victoria it supplies information for reports on the state of Victorian ICUs. Information from the APD is also supplied regularly to health services to assist them in service planning and reviewing their performance.

## 8.4 Victorian Intensive Care Data Review Committee

The Victorian Intensive Care Data Review Committee (VICDRC) was established in 2002 as a joint initiative between ANZICS and the department. VICDRC is a working group of ICAC.

VICDRC was established to review and analyse data about intensive care services in Victoria and to provide advice to ICAC, the Victorian Quality Council and the department on the standards of data collection, new directions for data collection and the implications of the information being collected.

VICDRC produces two annual reports detailing the activities and results of patient care within Victorian ICUs based on data provided by ANZICS, primarily from the APD. One report is written for Victoria health services and clinicians and the other for the general public. Both reports detail the activities and results of patient care within Victorian ICUs. The data is used to benchmark standards of care against comparable units and international standards. Important information in these reports includes the length of ICU episodes, the source of admission to the ICU and the Standardised Mortality Ratio.

## 8.5 Australia and New Zealand Paediatric Intensive Care Registry

The ANZICS Paediatric Registry (ANZPIC) was established in 1997 with contributions predominantly from specialist paediatric ICUs. It provides a bi-national paediatric intensive care overview through collecting patient episode data information, risk adjusted scores and research via an annual survey. The registry publishes an annual report. ANZPIC is similar to the APD but collects information on admissions to paediatric ICUs in Australasia. The ANZICS Paediatric Study Group coordinates multi-centre research in paediatric intensive care and oversees the activities of the ANZPIC registry.

## 9. Intensive care bed capacity in Victoria's public hospitals

Accurate information about intensive care bed capacity in Victoria's public hospitals is integral to service system planning and managing demand for intensive care services. Quantifying ICU capacity is problematic. There are varying data definitions on measuring ICU bed stock, and an ICU bed can be defined in a number of ways including a physical bed, a staffed bed, an equipped bed, a funded bed, an available bed and an open bed. Other key issues include varying health service compliance in data submission to available ICU databases and the multipurpose nature of ICUs providing ICU, HDU, CCU or various combinations of these functions within a single unit. In addition, the department does not fund ICU services specifically and each health service determines the number of ICU beds they provide according to demand.

*Your hospitals, January to June 2006* (Department of Human Services, 2006) reports the average number of Victorian public hospital ICU beds open has increased from 139 in 2004-05 to 144 in 2005-06.<sup>6</sup> As part of the 2006-07 Victorian State Budget, funding was provided for six additional beds to be opened.

The *Annual report intensive care for adults in Victorian public hospitals* prepared by the Victorian Intensive Care Data Review Committee (VICDRC) provides data reported by health services on the number of adult public and private ICU beds in Victoria. The draft 2004-05 report notes there were 270 physical beds, 221 available beds and 180 ventilator beds in public and private hospitals providing intensive care services.<sup>7</sup>

The report *Intensive care resources and activity: Australia and New Zealand 2003-05* (based on information provided by 139 Australian public and private hospitals) identifies that ICU bed availability<sup>8</sup> in Victoria's public hospitals was 5.4 per 100,000 population against the national average of 5.7 per 100,000 population.

<sup>6</sup> Based upon ICU self-reported open beds in a clinical information system.

<sup>7</sup> Intensive care beds are defined according to number of physical bed spaces, the number of fully equipped, staffed and funded beds and the number of beds in which patients can be physically ventilated.

<sup>8</sup> Available ventilated beds

## 10. Demand for intensive care services in Victoria's public hospitals

### 10.1 Trends in demand for intensive care services

The following commentary provides a brief overview of trends in demand for intensive care services in Victoria's public hospitals using VAED for the period 2002–03 and 2005–06.

VAED data<sup>9</sup> identifies that a total of 19,351 patients were admitted to Victoria's public hospitals ICUs in 2005–06, compared with 18,498 in 2002–03. Of the 19,351 patients admitted in 2005–06, 1,328 patients aged 0–14 years were admitted to an ICU in 1999–2000 compared with 1,282 in 2002–03.

Of the total number of patients admitted to an ICU in 2005–06, 50 per cent were mechanically ventilated. The number of patients mechanically ventilated has increased from 8,891 in 2002–03 to 9,606 in 2005–06 – an average annual increase of two per cent.

Between 2002–03 and 2005–06 the number of hours patients have spent in ICUs has increased from 1.54 million hours to 1.66 million hours—an average annual increase of 2.5 per cent.

VAED data identifies that the proportion of emergency and elective patients have remained consistent over the previous three years, with emergency patients representing approximately 70 per cent of admissions to Victoria's public hospitals ICUs.

Information accessed from VAERCS and through the critical care bedstate website shows that demand for ICU beds continues to be high. In 2003–04, Victoria provided on average 141 metropolitan ICU beds compared to 144 in 2005–06 – an increase of 2.1 per cent.

There are some transfers of public ICU patients from public to private hospitals when the demand for public critical care resources exceeds the capacity of the public system. The numbers of transfers of public ICU patients from public to private hospitals coordinated by VAERCS decreased from 224 in 2001–02 to 155 in 2005–06.<sup>10</sup> The department currently provides funding for health services for private hospital transfers during periods of peak demand. Where health services that offer critical care services utilise private critical care as flexible capacity, the referring health services is fully responsible for the cost of the patient's care. WIES revenue can be earned for these patients where there is a contract arrangement with the private hospital. Department of Veterans Affairs clients are subject to separate arrangements. When a health service does not offer critical care services, the department funds private care for up to three days through VAERCS.

<sup>9</sup> VAED data on ICU patients excludes those aged less than 28 days and includes all WIES funded patients with recorded ICU hours in VAED.

<sup>10</sup> Information provided by VAERCS, February 2007.

The number of transfers of public ICU patients from public hospitals to private hospital reported by VAERCS is outlined in Figure 3.<sup>11</sup>

**Figure 3 Number of transfers of public ICU patients from public hospitals to private hospitals**

Year	Number of transfers
2001-02	224
2002-03	197
2003-04	161
2004-05	139
2005-06	155
2006-07 (as of 28 February 2007)	144

## 10.2 Key issues in managing demand for intensive care services

The following section provides commentary on some of the key issues for managing demand for intensive care services. It is not intended to provide a comprehensive summary of intensive care service delivery issues that will be explored in more detail in the policy framework following the critical care workshop.

A range of factors influence demand for intensive care services. Literature identifies that demand for intensive care is likely to increase due in part to the ageing population.<sup>12</sup> There have been significant changes in Victoria's demography over the past decade, and since 1960 the population has been gradually ageing with the median age rising from 29.6 to 35.4 years. Other demand pressures include advances in medication and life-support technologies, increasing evidence that specialist intensive care services improve patient outcomes and increasing public expectations to receive critical care support.

*Intensive care workforce in Australia: supply and requirements 1997-2008* (1999) notes specific issues that will place demand pressures on paediatric intensive care services including surgical advances in particular cardiac surgery, transplantation and epilepsy surgery, expanding oncological services and changing expectations of parents for particular groups of children with chronic disabilities.

Managing access to intensive care services is complex. Demand for adult and paediatric intensive care is unpredictable and can result in periods of peak demand including seasonal patterns. A key challenge includes balancing competing emergency and elective demand for ICU beds. During periods of high demand for ICU beds a number of strategies are utilised by Victoria's public hospitals to manage demand including transferring patients between public hospitals, use of private hospital ICU beds, managing critically ill patients in locations other than ICUs such as emergency departments and theatre recovery rooms, and postponing of elective surgery.

<sup>11</sup> *ibid*

<sup>12</sup> *Ministry for Health and Long Term Care, 2005. Final report of the Ontario critical care steering committee, March 2005; NSW Health, 2001. NSW action plan for health: intensive care service plan – adult services; Department of Human Services, 1997. Review of intensive care in Victoria, Melbourne.*

Critical care workforce shortages remain a major constraint on increasing ICU capacity, in particular a shortage of critical care nurses. *Critical care nurse workforce in Australia 2001-2011* notes that, as in other countries comparable to Australia, there was a shortage of critical care nurses and a relatively high attrition rate compared with other nurse specialities. The draft VICDRC 2004-05 annual report identifies the number of vacancies in Australia increased from 67 in 2003-04 to 85.1 in 2004-05.

## 11. The intensive care workforce

Providing safe, quality intensive care requires an adequate supply of a suitably trained workforce and staff who have credentials and competencies to provide intensive care services based on evidenced-based practice. Intensive care services are provided by a wide range of professionals including intensive care practitioners, the majority of who are specialists<sup>13</sup>, nursing staff, allied health and other non-professional staff.

Standards and guidelines such as those from professional organisations guide the staffing arrangements/minimum staffing levels in ICUs in Australia. Key examples are:

- Joint Faculty of Intensive Care Medicine *Policy document review IC-1* (2003) that outlines minimum standards in relation to work practice/caseload and staffing requirements for Level 1, 2 and 3 ICUs
- Australian College of Critical Care Nurses *Staffing position statement (2003) on intensive care nursing staffing* that recommends 10 key points and principles to meet the expected standards of critical care nursing in Australia.

### 11.1 Intensive care medical workforce

Specific programs for medical training in intensive care in Australia were previously provided through the Australian and New Zealand College of Anaesthetists (ANZCA) and the Royal Australasian College of Physicians (RACP). Currently there is a single training and certification organisation, the Joint Faculty of Intensive Care Medicine (JFICM) which is a joint faculty of both ANZCA and RACP.

The characteristics of the intensive care medical workforce was the subject of a review presented to the Australian Health Ministers Advisory Council in 1999. *The intensive care workforce in Australia: supply and requirements (1997-2008)* report noted that:

- intensive care has a comparatively small specialist medical workforce
- intensive care medical specialists work mainly in metropolitan areas
- the intensive care medical specialist workforce has a relatively young age profile
- the proportion of female medical intensive care specialists is below that of all specialists, and well below that for the medical workforce as a whole
- intensive care medical specialists have one of the highest workloads of any speciality.

<sup>13</sup> For the purpose of this document, a specialist is defined as a practitioner who has a fellowship with a specialist college such as the Australian and New Zealand College of Anaesthetists (ANZCA) and the Royal Australian College of Physicians.

Information on the number of intensive care medical practitioners working in Victoria's public hospitals is available through a number of data sources. The *Victorian Intensive Care Data Review Committee draft 2004-05 annual report* identifies that there were 60.5 full-time equivalent intensive care practitioners practicing in Victoria's public and private hospitals, of which 47.2 held specialist qualifications and nearly all practiced in Level 3 ICUs. This compares with a total of 55.7 intensive care practitioners in 2002-03, of which 38.2 held specialist qualifications.

The number of medical practitioners and trainees providing services in Victoria's public hospitals is also collected through the department's annual Medical Workforce Survey. The information is used to develop workforce planning measures, and as a basis for future vocational training requirements. This voluntary survey aims to capture a snapshot of the number of medical practitioners and their workload by medical specialty for a defined two-week period.

Data provided by 12 metropolitan and two rural hospitals identified there were 28 senior medical consultants and 27 visiting medical officers providing intensive care services in Victoria's public hospitals in 2006. This survey is undertaken annually and informs national work on vocational training numbers undertaken by the Medical Training Review Panel. A total of 70 advanced training positions were provided for this period.<sup>14</sup> Figure 4 provides commentary on some of the key survey results for 2006.

**Figure 4 Intensive care physicians in adult medicine: positions as number of staff and hours of sessional work per fortnight**

Hospitals	Visiting medical officers	Senior medical consultants	Total hours of sessional work per fortnight	Average hours per person
Metropolitan	19	24	1902.2	36.8
Females (percentage)	26	8		
Rural	8	4	203.7	17
Females (percentage)	0	0		
<b>Total</b>	<b>27</b>	<b>28</b>	<b>1416.5</b>	<b>2105.9</b>

Physician advanced vocational training in adult intensive care medicine – positions as number of staff and full-time equivalents (FTE) by hospital, 2006

Hospital	Y1	Y2	Y3
Metropolitan	21	13	32
Female (percentage)	24	45	32
Rural	2	1	1
Female (percentage)	50	0	100

<sup>14</sup> Data was provided by nine metropolitan and one rural hospital.

Recommendations outlined in *Victoria's intensive care services review – planning for intensive care services* (2001) included that Victoria adopt Australian Medical Workforce Advisory Committee (AMWAC) recommendations for intensive care medical staff. Using the supply benchmark of four to five intensive care specialists per 10-12 beds, AMWAC noted that the national medical intensive care workforce would need to increase from an estimated 398 in 1999 to approximately 464 to 500 in 2008. AMWAC noted that a key challenge for the profession will be to promote intensive care as a career option to junior doctors.

The department has developed the Specialist Training Annual Growth (STAG) model to support medical specialist training growth in Victoria and to provide an evidence base to direct funding by determining growth capacity in public hospitals. Funding will be used to support an adequate supply of medical specialists through matching growth in service demand to trainee numbers. The model also aims to facilitate equitable distribution of specialist trainees across hospitals.

## 11.2 Intensive care nursing staff

In Victoria, ICUs are staffed by Division 1 registered nurses and, in some cases, Division 2 registered nurses. The term 'registered nurse' encompasses nurses, midwives, nurse practitioners as well as industrial award categories such as clinical nurse specialist and clinical nurse consultants. Critical care nurse roles are increasingly being developed within new workforce models of care such as medical emergency teams, liaison nurse and nurse practitioner roles.

The Nurses Board of Victoria (NBV) accredits courses leading to registration and/or endorsement. In some instances, such as nurse practitioners and post-registration midwifery practice, further qualifications may be required for licencing or statutory authorisation purposes. However, in most other instances, including critical care, qualifications and additional formal training reflect industry of professional standards but are not mandatory for working in specialised areas of nursing practice.<sup>15</sup>

Nurse Labour Force Census data identifies that in 2003, 50 per cent of registered nurses held a postgraduate qualification and that postgraduate course in critical care and midwifery was most frequently held. In the case of critical care qualifications, 55 per cent of nurses with a postgraduate qualification were working in the area.

Although the NBV does not accredit postgraduate critical care (nursing) courses, those conducted in the higher education sector are required to meet universities accreditation processes.

Some characteristics of the nursing intensive care workforce identified in the Australian Health Workforce Advisory Committee report, *Critical care nurse workforce in Australia 2001-2011* include:

- critical care nurses provide holistic care for ICU patients
- critical care nurses have a relatively high attrition rate compared with other nursing specialties
- the majority of critical care nurses are female and work and reside in capital cities
- the average number of hours worked per week is lowest in the 35-39 years age group.

<sup>15</sup> *National Nursing and Education Taskforce 2006, Maximising Education Pathways. A report on maximising education pathways for nurses and midwives in Australia.*

Information on the number of critical care nurses is available from a number of sources. The *Victorian Intensive Care Data Review Committee draft 2004-05 annual report* identifies that there were 1,440 registered nurses working in Victoria's ICUs in 2004-05 compared with 1,414 registered nurses in 2002-03. For each of the period, 75 per cent of the registered nurses held a critical care qualification.

The Nurse Labour Force Census circulated by the Nurses Board of Victoria (NBV) on behalf of the department also provides data on the critical care nurse workforce. The survey is sent to every nurse eligible for registration. The data is used in Australian Institute of Health and Welfare reports such as the *Nurse labour force* reports, and is utilised by the department to inform evidence-based nurse workforce planning and recruitment and retention policy. Figure 5 summaries key information derived from the Nurse Labour Force Census (2004).

**Figure 5 Nurse Labour Force, Victoria, 2003, Australian Institute of Health and Welfare**

	Critical care/ emergency (1)	Total nurses in Victoria
Employed	6,005	68,687
Average age	37.0	42.1
Male percentage	11.2	8.3
Average weekly hours	32.5	32.1
Part-time percentage	63.4	60.9
Per cent working 45 hours or more per week	10.6	9.1
Per cent in non-metropolitan areas	24.7	33.1
Per cent with corresponding qualification	54.5	
Number of nurses with critical care/emergency qualifications but not working in critical care/emergency setting	-	3118

*(1) Includes: cardiac/coronary care, critical care, emergency, high dependency, intensive care, neonatal intensive care, paediatric critical care and retrieval.*

*Victoria's intensive care services review - planning for intensive care services* (2001) recommended that Victoria adopt recommendations for intensive care nursing staff outlined in the report *Critical care nurse workforce in Australian 2001-2011*. These include ensuring an adequate supply of registered nurses to work in critical care (quantity), ensuring an adequate supply of qualified critical care nurses (quality), ensuring data for ongoing and complete working supply and requirement analysis and monitoring of the workforce.

### 11.3 Intensive care allied health staff

Allied health professionals also play a key role in providing intensive care services and clinical support to ICUs, and some allied health professions are increasingly providing services to sicker patients in more complex settings. For example, there has been a marked increase in the demand for speech pathology services in ICUs partially due to their specialised skills in managing swallowing and communication disorders associated with tracheostomies and ventilator dependency. Hospital pharmacists, through their involvement in all aspects of medicine use are also involved in a range of specialist areas that include intensive care, and are members of the multidisciplinary team that attend daily ward rounds in intensive care and are involved in the preparation of drug protocols for the area.

## 12. Intensive care funding in Victoria's public hospitals

Victorian intensive care services are funded through a casemix system. Individual health services are allocated payments based on the number of patient episodes and the classification of each episode according to diagnosis and type of service provided. ICU patients attract Weighted Inlier Equivalent Separation (WIES) payments as a part of the Diagnosis Related Group (DRG) payment with an additional co-payment based on the number of hours of mechanical ventilation (0.7729 WIES per day in 2005–06) for specific DRGs. The mechanical ventilation co-payment is a proxy payment to recognise the full range of costs associated with treating intensive care patients. Derivation of both the DRG payment and the mechanical ventilation co-payment is based on the analysis of costs supplied annually to the department by health services.

The report *Planning for intensive care services in Victoria* (2001) noted that there was no systematic leverage on the hospital system to ensure the availability of ICU services in Victoria, and that future intensive care funding models be based on principles that focus on the availability of ICU services to the Victorian population. In response, the department commenced an additional co-payment (0.6980 WIES) in 2003–04 for each episode of care involving mechanical ventilation to support bed availability.

*Victoria-public hospitals and mental health services: policy and funding guidelines 2006-07* identifies developing a critical care funding strategy to facilitate appropriate capacity at a local and system level to meet peak demand as a priority.

## 13. Quality and safety of critical care services in Victoria's public hospitals

Literature clearly demonstrates that commitment to improving the quality and safety of care supports improved clinical outcomes for patients.<sup>16</sup>

ANZICS has three core committees involved in improving quality of care: Safety and Quality Committee, ANZICS Database Management Committee (ADMC) and the ANZICS Clinical Trials Group (CTG) that facilitate peer review and quality enhancements and provide audit and analysis of intensive care service delivery in Australia. The ADMC has developed a program for development of key performance indicators and research initiatives to enhance safety and quality of care.

VICDRC provides an annual report detailing the activities and results of patient care within Victorian ICUs. The draft VICDRC 2004-05 annual report shows a standardised mortality rate (SMR) for Victoria's ICU patients of 72 per cent (ie. 72 per cent of patients who are anticipated to die due to their severity of illness on admission to ICU do die) reflecting that the mortality in Victorian ICU units is lower than would be expected based on international comparisons of comparably ill patients.

Improving safety and quality is dependent on mechanisms to analyse performance and variance at individual units, hospitals and system wide. There is a need to ensure uniform intensive care data collection and development of consistent definitions to support collection of clinical outcomes and indicator data. Activities identified for future consideration by VICDRC include reviewing scoring rates and SMRs including techniques to provide early warning for changes in SMR rates, developing strategies to manage outlier performance, strategic linkages with other databases that manage ICU performance and evaluating the impact of after hours discharges on in-hospital mortality.

Future strategic directions for the department's Quality and Safety Branch include:

- developing a statewide clinical governance that will define a structured approach for health services toward the application of clinical responsibility and accountability to ensure optimal outcomes for Victorians
- implementing a formalised approach to clinical performance reporting to support health services and the department to improve clinical outcomes (key features of this approach will be benchmarking, the recognition of outstanding practices and identification of areas of concern, to ensure that responses are targeted to achieve the greatest benefit)
- enhancing capacity to respond to clinical incidents through implementing an incident information system that will include statewide, standard methodology for the way clinical incident information is reported; statewide aggregation, analysis and trending of multi-level clinical incident data; mechanisms for evaluation of the clinical incident data and identifying trends and responses that are targeted to identified problematic areas
- implementing a statewide credentialing and scope of practice policy to provide the tools for assuring a safe and appropriate healthcare workforce
- implementing strategies to achieve consistency of, and improvements in, clinical practice to reduce care and outcome variation utilising broad system engagement through a network of clinical champions and fellows to ensure relevance, awareness, sustainability and credibility of the initiatives.

<sup>16</sup> Victorian Quality Council, 2003. *Better quality, better healthcare: a safety and quality improvement framework for Victorian health services*, Melbourne.

## 14. Relevant initiatives to date

A range of initiatives are relevant to developing the critical care policy framework. The following commentary provides an overview of key initiatives which have been undertaken.

### 14.1 Victoria's critical care services review – planning for intensive care services (2001)

The report *Planning for intensive care services in Victoria* was released in 2001. The primary focus of the project was to examine the level and distribution of intensive care services and prepare a planning framework for providing services into the future. The report included a list of recommendations in relation to planning for intensive care services in Victoria.

The department has implemented a range of strategies in response to the recommendations of the *Intensive care services review – planning for intensive care services* (2001) including formation of ICAC, use of web-enabled technology to improve access to information about ICU availability, providing funding to use private ICU stocks during periods of peak demand, opening of a helipad at the Royal Melbourne Hospital, funding of the ANZICS database to produce reports on Australian ICU resources and performance and allocation of funding for additional ICU beds across the system.

### 14.2 Adult emergency retrieval services in Victoria review

The department commenced a review of Victoria's adult emergency retrieval service model in 2007. The discussion paper *Adult emergency retrieval services in Victoria* (2007) identifies 10 principles for adult retrieval services and a recommended service model to be implemented in 2007–08.

The ten principles are:

- one-stop shop
- central governance structure
- operational integration
- robust clinical governance processes
- centralised service
- comprehensive system
- accessible service
- promote health service participation
- early warning and activation.

### 14.3 Review of cardiac services and development of a service planning framework for adult cardiac services in Victoria

The department commenced a review of Victoria's adult cardiac services in 2007. The aim of the review is to enhance quality and accessibility of acute and sub-acute cardiac services in Victoria's public health services. The scope of the review includes a assessment of current adult cardiac services and developing an integrated statewide planning framework for delivering acute (diagnostic assessment and treatment) and sub-acute (rehabilitation) cardiac services in Victoria.

## 14.4 Review of Victorian paediatric services: Department of Human Services response (2003)

The department commissioned a review of Victorian paediatric services as a component of the *Metropolitan health strategy* and the *Victorian rural human services strategy*. The final report included more than 40 recommendations for the development and enhancement of paediatric services in Victoria.

## 14.5 Intensive Care Best Practice Program

As part of the 2005–06 State Budget, \$1 million was provided to 18 public hospitals to facilitate best practice use of intensive care resources and support innovative workforce models of care.<sup>17</sup>

Information from health service reports provided to the department identified that the hours of ICU liaison nurse (ICU LN) service varied from eight hours per day Monday to Friday to 10 hours per day seven days a week. Outcomes reported included that the majority of time was spent clinically reviewing and following-up patients post ICU discharge, almost 50 per cent of ICU LN referrals were for review of patients who had not been admitted to the ICU and that the availability of the ICU LN positions has increased clinician confidence to safely transfer ICU patients to general wards after hours.

All health services have some form of internal hospital emergency medical response system as part of the code blue response system. Formal medical emergency team (MET) teams have been established by 10 health services. Outcomes reported from the introduction of MET are reported to include a reduction in code blue events, reduction in the number the serious adverse events reported and implementation of a regular audit process.

Future directions for the Intensive Care Best Practice Program are currently being scoped.

## 14.6 Better skills, best care strategy

The department developed the *Better skills, best care strategy* to progress long-term workforce change and improve the sustainability of the health system. The strategy recognises that increasing the number of health workers is achievable and can prevent shortages that restrict service capacity in some instances, although this alone will not be enough to meet future demand or achieve sustainable services.<sup>18</sup>

As part of stage one of the strategy implemented in 2005–06, a range of projects were piloted in metropolitan and rural health services to test and support amended workforce roles in a variety of settings. This included a pilot that examined the potential role of Division 2 nurses in ICUs. Through stage two of the strategy, opportunities for workforce redesign in intensive care, anaesthetics and emergency have been identified through service-wide projects in eight metropolitan and rural health services. Intensive care projects are currently underway at Southern Health and Barwon Health.

<sup>17</sup> Information collated from health service reports on Intensive Care Best Practice Program provided to department.

<sup>18</sup> Australian Health Ministers Conference 2004, National Health Workforce Strategic Framework, Sydney; Department of Human Services, 2005. Productivity Commission study into the health workforce: Victorian Government submission, Melbourne.

## 14.7 Intensive Care Clinical Information System

In 2003, the Office of the Chief Clinical Adviser established a reference group to investigate the development and implementation of a statewide intensive clinical information system (ICIS). A business case was developed and provided to the ICAC in 2006. An intensive care clinical information system will require consideration within the context of the strategic directions of the Office of Health Information Service.

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