

INTENSIVE CARE INDICATORS

CLINICAL INDICATOR USERS' MANUAL

VERSION 4 FOR USE IN 2011

The data collected with this Users' Manual are to be reported using the
ACHS Performance Indicator Reporting Tool (PIRT ONLINE) at
www.achs.org.au/pirt

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FOREWORD

This is the third time that the Intensive Care indicator set has been reviewed since their inception in 1998, and the Working Party considered a number of factors during their deliberations.

Indicator Area 1 covers access to intensive care services. Refused appropriate admissions, cancellations of elective surgery, transfers due to lack of Intensive Care Unit (ICU) bed availability, after hours discharges from the ICU, and exit block greater than 12 hours remain unchanged.

Indicator Area 2 has changed to recognising and responding to clinical deterioration within 72 hours of being discharged from an ICU, and relates specifically to the number of rapid response calls to patients discharged from the ICU within 72 hours. This reflects the increasing opinion that readmission to ICU within 72 hours is a more general marker of hospital care reflecting, at times, inadequate ward care.

Indicator Area 3 addresses venous thromboembolism prophylaxis, and draws on the newly published National Health and Medical Research Council guidelines.

Indicator Area 4 examines centrally-inserted and peripherally-inserted central line- associated bacteraemia rates and reflects the increasing emphasis on healthcare associated infections.

Indicator Area 5 continues to emphasise the need for ICUs to continue to report their data to the Australia and New Zealand Intensive Care Society (ANZICS) Centre for Outcome and Resource Evaluation (CORE) patient database and complete the CORE resource survey.

Indicator Area 6 is new and sets minimum standards for a rapid response system. In addition, it requires submission of data on deaths of patients who do not have a 'do not resuscitate' (DNR) order.

Safety and quality of care in intensive care remains a rapidly evolving area, and the choice of indicators reflects this.

Dr Anthony Burrell
Chair, Intensive Care Clinical Indicator Working Party
2010

INTRODUCTION TO VERSION 4

The purpose of this foreword is to assist organisations with the collection and reporting of clinical indicators. The foreword summarises:

1. Data collection periods
2. Data collection methods
3. Suggested sources for data collection of indicators
4. Desired rates
5. Stratification variables
6. Data cleaning rules
7. EQuIP 4 and clinical indicators

1. Data collection periods

For the **January to June 2011** collection period organisations must submit their data to the ACHS by **20 August 2011**.

For the **July to December 2011** collection period organisations must submit their data to the ACHS by **20 February 2012**.

The data collected with this Users' Manual are to be reported using the ACHS Performance Indicator Reporting Tool (PIRT ONLINE) at www.achs.org.au/pirt

2. Data Collection Methods

Pre-existing data sources should be used where ever possible to reduce duplication and maximise efficiency. Relevant departments should be consulted regarding possible data sources. Data collection is most easily done if it is integrated into an existing organisation function.

3. Suggested sources for data collection of indicators

The following data sources are typical:

- Clinical data (adverse event system, medical record review, clinical pathways, specific specialty databases eg triage database, intensive care database, pathology database).
- Administrative data (inpatient statistics forms, patient admission system, ICD-10-AM codes).

Empty Booklets: The ACHS provides empty booklets (**Appendix 1**) for each of the clinical indicator sets. The booklets can be used as a (hard copy) data collection device. It is recommended that the appropriate booklets are printed and distributed to the units / departments at the beginning of the data collection period. The booklets can be accessed as PDF documents and as excel spreadsheets from the PIRT Online.

ICD-10-AM codes: Most indicator sets contain an appendix that links individual indicators to specific ICD-10-AM codes. This data source can therefore be used to extract data for some numerators and denominators (**Appendix 2**).

4. Desired rates

Most indicators have a desirable outcome that is specified as being either high (H) or low (L). The remainder are unspecified (N). Indicators are allocated a *Not Specified* (N) level where the relationship between the measure and the quality of care is not clear or is ambiguous.

For example:

- Thrombolysis initiated within 1 hour of presentation for AMI (H)
- Unplanned return to the operating room during the same admission (L)
- Adverse drug reactions reported to ADRAC (N)

5. Stratification variables

The ACHS, in collaboration with relevant medical colleges, associations and specialty societies have developed the following stratification variables to enable 'like' organisations to be grouped for the purpose of comparison.

Three levels of comparison are available:

- An individual organisation's data results compared to **ALL** organisations who submit data for a particular indicator.
- An individual organisation's data results compared to all other organisations submitting data within the same sector, that is, public or private.
- An individual organisation's data results compared to other organisations classified according to defined stratification variables as described in the section below – *Intensive Care stratification variables*, and by public or private sector.

Intensive Care stratification variables

All organisations are stratified into public / private categories and intensive care unit classification, according to the College of Intensive Care Medicine of Australia and New Zealand (Refer to Appendix 3):

- Adult ICU – Level III
- Adult ICU – Level II
- Adult ICU – Level I

6. Data cleaning rules for Intensive Care Indicators version 4

- The **denominator** figures for **Indicators 1.1, 1.2, and 1.3** are **NOT** expected to be the same.
- The **denominator** figure for **Indicator 1.1** equals the **denominator** figure for **Indicator 3.1 or 5.1 PLUS** the **numerator** figure of **Indicator 1.1**.
- The **denominator** figure for **Indicator 1.2** equals the **denominator** figure for **Indicator 3.1 or 5.1 PLUS** the **numerator** figure of **Indicator 1.2**.
- The **denominator** figure for **Indicator 1.3** equals the **denominator** figure for **Indicator 3.1 or 5.1 PLUS** the **numerator** figure of **Indicator 1.3**.
- The **denominator** figures for **Indicators 1.4, 1.5, and 2.1** should be the same, as they share the same definition.
- The **denominator** figures for **Indicators 3.1 and 5.1** should be the same, as they share the same definition.
- The **denominator** figures for **Indicators 6.1, 6.2, 6.3, 6.4, and 6.5** should be the same, as they share the same definition.

Note:

- **Paediatric and neonatal patients are excluded from all indicators in this set**, as indicators relevant to paediatric intensive care are contained in the Paediatric indicator set. For the purposes of this indicator set, adult patients are those over the age of 15 years and 364 days.

7. EQulP 4 and clinical indicators

The use of clinical indicators by health care organisations continues to be an important component of the Evaluation and Quality Improvement Program (EQulP). The collection of specific clinical indicators is generally not mandatory; however, the EQulP 4 **criteraion 1.1.2, 1.1.4, 1.3.1 and 1.4.1** are mandatory criterion.

All clinical indicators are referenced to specific EQulP 4 criteria. The clinical indicators are a valid source of clinical audit criteria and may be used as evidence to support criteria 1.1.2, 1.1.4, 1.3.1, 1.4.1 and other appropriate criteria. Table 1 shows the EQulP 4 functions, standards and criteria and highlights the mandatory criteria.

The *Clinical Indicator Summary Guide* is a publication which has been developed to demonstrate the usefulness and relevance of the current ACHS clinical indicators. This publication consolidates more than 350 clinical indicators in an easy to use reference guide including linkage of individual indicators to the EQulP 4 criteria. This document also provides further information about the 20th and 80th centile rates for individual clinical indicators and whether indicators are associated with a potentially undesirable outcome or adverse event. The publication is available on the ACHS website www.achs.org.au.

Table 1 identifies, at a glance, the three functions, 13 standards and each of the 45 criteria.

1. CLINICAL	2. SUPPORT	3. CORPORATE
1.1 Consumers / patients are provided with high quality care throughout the care delivery process.	2.1 The governing body leads the organisation in its commitment to improving performance and ensures the effective management of corporate and clinical risks.	3.1 The governing body leads the organisation's strategic direction to ensure the provision of quality, safe services.
<i>1.1.1 The assessment system ensures current and ongoing needs of the consumer / patient are identified.</i>	<i>2.1.1 The organisation's continuous quality improvement system demonstrates its commitment to improving the outcomes of care and service delivery.</i>	3.1.1 The organisation provides quality, safe care through strategic and operational planning and development.
<i>1.1.2 Care is planned and delivered in partnership with the consumer / patient and when relevant, the carer, to achieve the best possible outcomes.</i>	<i>2.1.2 The integrated organisation-wide risk management policy and system ensure that corporate and clinical risks are identified, minimised and managed.</i>	3.1.2 Governance is assisted by formal structures and delegation practices within the organisation.
<i>1.1.3 Consumers / patients are informed of the consent process, understand and provide consent for their health care.</i>	<i>2.1.3 Health care incidents, complaints and feedback are managed to ensure improvements to the systems of care.</i>	<i>3.1.3 Processes for credentialling and defining the scope of clinical practice support safe, quality health care.</i>
<i>1.1.4 Care is evaluated by health care providers and when appropriate with the consumer / patient and carer.</i>	2.2 Human resources management supports quality health care, a competent workforce and a satisfying working environment for staff.	3.1.4 External service providers are managed to maximise quality care and service delivery.
<i>1.1.5 Processes for discharge / transfer address the needs of the consumer / patient for ongoing care.</i>	2.2.1 Human resources planning supports the organisation's current and future ability to address needs.	<i>3.1.5 Documented clinical and corporate policies assist the organisation to provide quality care.</i>
1.1.6 Systems for ongoing care of the consumer / patient are coordinated and effective.	2.2.2 The recruitment, selection and appointment system ensures that the skill mix and competence of staff, and mix of volunteers, meets the needs of the organisation.	3.2 The organisation maintains a safe environment for employees, consumers / patients and visitors.
1.1.7 Systems exist to ensure that the care of dying and deceased consumers / patients is managed with dignity and comfort.	2.2.3 The continuing employment and performance development system ensures the competence of staff and volunteers.	<i>3.2.1 Safety management systems ensure safety and wellbeing for consumers / patients, staff, visitors and contractors.</i>
<i>1.1.8 The health record ensures comprehensive and accurate information is recorded and used in care delivery.</i>	2.2.4 The learning and development system ensures the skill and competence of staff and volunteers.	3.2.2 Buildings, signage, plant, equipment, supplies, utilities and consumables are managed safely and used efficiently and effectively.
1.2 Consumers / patients / communities have access to health services and care appropriate to their needs.	2.2.5 Employee support systems and workplace relations assist the organisation to achieve its goals.	3.2.3 Waste and environmental management systems support safe practice and a safe environment.
1.2.1 The community has information on, and access to, health services and care appropriate to its needs.	2.3 Information management systems enable the organisation's goals to be met.	<i>3.2.4 Emergency and disaster management supports safe practice and a safe environment.</i>
1.2.2 Access and admission to the system of care is prioritised according to clinical need.	2.3.1 Records management systems support the collection of information and meet the organisation's needs.	3.2.5 Security management supports safe practice and a safe environment.
1.3 Appropriate care and services are provided to consumers / patients.	2.3.2 Information and data management and collection systems are used to assist in meeting the strategic and operational needs of the organisation.	
1.3.1 Health care and services are appropriate and delivered in the most appropriate setting.	2.3.3 Data and information are used effectively to support and improve care and services.	

1.4 The organisation provides care and services that achieve expected outcomes.	2.3.4 The organisation has an integrated approach to the planning, use and management of information and communication technology (I&CT).
1.4.1 Care and services are planned, developed and delivered based on the best available evidence and in the most effective way.	2.4 The organisation promotes the health of the population.
1.5 The organisation provides safe care and services.	2.4.1 Better health and wellbeing for consumers / patients, staff and the broader community are promoted by the organisation.
1.5.1 Medications are managed to ensure safe and effective practice.	2.5 The organisation encourages and adequately governs the conduct of health and medical research to improve the safety and quality of health care.
<i>1.5.2 The infection control system supports safe practice and ensures a safe environment for consumers / patients and health care workers.</i>	2.5.1 The organisation's research program promotes the development of knowledge and its application in the health care setting, protects consumers / patients and manages organisational risks associated with research.
1.5.3 The incidence and impact of pressure ulcers are minimised through a pressure ulcer prevention and management strategy.	
1.5.4 The incidence of falls and fall injuries is minimised through a falls management program.	
1.5.5 The system for prescription, sample collection, storage and transportation and administration of blood and blood components ensures safe and appropriate practice.	
1.5.6 The organisation ensures that the correct patient receives the correct procedure on the correct site.	
1.6 The governing body is committed to consumer participation.	
1.6.1 Input is sought from consumers, carers and the community in planning, delivery and evaluation of the health service.	
1.6.2 Consumers / patients are informed of their rights and responsibilities.	
1.6.3 The organisation makes provision for consumers / patients from culturally and linguistically diverse backgrounds and consumers / patients with special needs.	

Key:	<i>Mandatory Criteria</i>
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INDICATOR AREA 1: ACCESS AND EXIT BLOCK

Indicator Topic

Inability to either admit an adult patient into an Intensive Care Unit (ICU) or discharge an adult patient from an ICU.

Rationale

While ICUs in Australian hospitals compare favourably with international benchmarks, occupancy rates are often high and result in limited reserve capacity for several days each month¹. Conversely, high hospital occupancy rates can result in the inability to discharge a patient from ICU to a less-acute unit. These phenomena are respectively referred to as ICU access and exit block, and should be routinely monitored and reported by health services as a key performance indicator of resources²⁻⁵.

ICU Access block describes a delay in admission of a patient to the ICU for any reason, such as no available beds, limited clinical staffing levels in the ICU, and so on. This does not include where a specialist ICU service, for example extracorporeal membrane oxygenation (ECMO), is not available in that ICU.

ICU Exit block describes the inability to discharge a patient from the ICU who is otherwise medically fit to leave, due to no available ward beds, limited clinical or ancillary staffing levels in the wards, and so on.

Type of Indicator

These are rate-based indicators addressing the availability and utilisation of resources.

Desired Rate

- 1.1 - Low
- 1.2 - Low
- 1.3 - Low
- 1.4 - Low
- 1.5 - Low

Definition of Terms

For the purpose of Indicators 1.1 – 1.5

Intensive Care Unit (ICU) 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 conditions.

Appendix 3 Minimum Standards for Intensive Care Units IC-1 (2010). Also available at the College of Intensive Care Medicine of Australia and New Zealand (<http://cicm.org.au/policydocs.php>).

For the purpose of Indicator 1.1

Appropriate patient – refers to an adult patient who would have been admitted to an ICU if a bed were available (this includes cancelled elective admissions).

Documented evidence – refers to a written notation in the patient chart by the Intensivist receiving the request of the inability to admit an appropriate patient or a specific document collected by the ICU to record such cases.

Inadequate resources – refers to limited or no available resources such as human (staffing levels) or physical (beds, equipment).

Note:

- **Delayed admissions** (less than twelve hours) are **NOT included** for the purpose of this indicator.

For the purpose of Indicator 1.2

Elective surgical cases – refers to patients scheduled for treatment in an operating theatre.

Deferred or cancelled – refers to the non performance of a procedure due to the unavailability of an ICU bed.

For the purpose of Indicator 1.3

A **no-bed transfer** occurs when a patient who could **usually** be appropriately cared for in the ICU (ie. adequate ICU and hospital expertise) is transferred to another hospital ICU because of lack of a staffed, resourced ICU bed. This may occur because a more urgent or critically ill patient requires admission. This would include patients transferred from the hospital's Emergency Department to another hospital ICU.

Transferred to another facility/ICU – refers to transfer to another hospital ICU.

Unavailability of an ICU bed – refers to lack of a staffed resourced ICU bed.

For the purpose of Indicators 1.4 and 1.5

Discharged patients from the ICU **include** patients that were readmitted but **exclude** patients who died while in the ICU.

Exit block – describes the inability to discharge a patient from the ICU who is otherwise medically fit to leave, due to no available ward beds, limited clinical or ancillary staffing levels in the wards, and so on.

Delayed more than 6 hours – refers to a delay of 6 hours from the time the decision is made to discharge the patient from the ICU (documented in the patient record) to the time the patient is discharged from the ICU.

Note:

- **Paediatric and neonatal patients are excluded from all indicators in this set.** Adult patients are those over the age of 15 years and 364 days.
- The **denominator** figures for **Indicators 1.1, 1.2, and 1.3** are **NOT** expected to be the same.
- The **denominator** figures for **Indicators 1.4 and 1.5** are the same.

Suggested Data Collection

Interrogation of the intensive care unit information system.

References:

- ¹ Duke GJ, Buist MD, Pilcher D, et al. Interventions to circumvent intensive care access block: a retrospective 2-year study across metropolitan Melbourne. *Med J Aust* 2009; 190(7): 375-378.
- ² Duke G, Santamaria J, Shann F, et al. Outcome-based clinical indicators for intensive care medicine. *Anaesth Intensive Care* 2005; 33(3): 303-310.
- ³ Duke GJ, Green JV, Briedis JH. Night-shift discharge from intensive care unit increases the mortality-risk of ICU survivors. *Anaesth Intensive Care* 2004; 32(5): 697-701.
- ⁴ Pilcher DV, Duke GJ, Bailey GC, et al. After-hours discharge from intensive care increases the risk of readmission and death. *Anaesth Intensive Care* 2005; 35(4): 477-485.
- ⁵ Duke GJ, Green JV. Outcome of critically ill patients undergoing interhospital transfer. *Med J Aust* 2001; 174(3): 122-125.

INDICATOR

Cl. 1.1	Numerator	Total number of appropriate adult patients (as defined in the manual) referred to an ICU, who have documented evidence by an Intensivist that they could not be admitted to the unit because of inadequate resources , during the 6 month time period
	Denominator	Total number of adult admissions into the ICU plus the non-admissions resulting from inadequate resources (that is numerator 1.1), during the 6 month time period
Cl. 1.2	Numerator	Total number of adult elective surgical cases deferred or cancelled due to lack of an ICU bed, during the 6 month time period
	Denominator	Total number of adult admissions into the ICU plus the non-admissions resulting from deferred or cancelled surgical cases due to lack of an ICU bed (that is numerator 1.2), during the 6 month time period
Cl. 1.3	Numerator	Total number of adult patients who were transferred to another facility/ICU due to unavailability of an ICU bed , during the 6 month time period
	Denominator	Total number of adult admissions into the ICU plus the non-admissions resulting from transfers to other facility/ICU due to bed unavailability (that is numerator 1.3), during the 6 month time period
Cl. 1.4	Numerator	Total number of adult patients whose discharge from the ICU was delayed more than 6 hours , during the 6 month time period
	Denominator	Total number of adult patients discharged alive from the ICU, during the 6 month time period
Cl. 1.5	Numerator	Total number of adult patients discharged from the ICU between 6pm and 6am , during the 6 month time period
	Denominator	Total number of adult patients discharged alive from the ICU, during the 6 month time period

<i>These indicators can be used to support the following EQUIP 4 criteria:</i>						
INDICATORS					CRITERION	
1.1	1.2	1.3	1.4	1.5		
✓	✓	✓	✓	✓	1.1.2	Care Planning and Delivery
✓	✓	✓	✓	✓	1.1.4	Evaluation of Care
✓	✓	✓	✓	✓	1.2.2	Access and Admission
✓	✓	✓	✓	✓	1.3.1	Appropriateness of Care
✓	✓	✓	✓	✓	1.4.1	Effectiveness of Care

AREA 2: INTENSIVE CARE PATIENT MANAGEMENT

Indicator Topic

Recognising and responding to clinical deterioration within 72 hours of being discharged from an Intensive Care Unit (ICU).

Rationale

Serious adverse events are common in hospitalised patients, and these events are usually preceded by warning signs that manifest as deteriorations of vital signs or a change in clinical condition up to 24 hours prior to an in-hospital death, cardiac arrest, or unplanned ICU admission¹⁻⁴. Early recognition of clinical deterioration, followed by prompt and effective action, can avert or minimise the probability of a poor clinical outcome for at-risk patients, and may mean that a lower level of intervention is required to stabilise a patient⁵⁻⁶. The need for early identification of at-risk patients has resulted in the introduction of a Rapid Response System (RRS) in Australia and internationally. This approach involves activation of a specialised Rapid Response Team (RRT) to review patients within less than five minutes that fulfil pre-defined changes in vital signs above or below set criteria⁴.

The patient discharged from an ICU is particularly vulnerable to clinical deterioration, as high ICU occupancy rates sometimes result in patients being discharged prior to a team-planned discharge day.

Type of Indicator

This is a rate-based indicator addressing the outcome of patient care, and is reported as the number of events per 1,000 patients discharged alive from the ICU.

Desired Rate

2.1 – Low

Definition of Terms

For the purpose of Indicator 2.1

Rapid response system (RRS) – refers to a system that provides emergency assistance to patients whose condition is deteriorating. It includes an afferent limb (the calling criteria and mechanism of activation) and an efferent limb (which may include a medical emergency team [MET], critical care outreach, or intensive care liaison nurses), that should be linked with governance and quality improvement arms³. The system will include the clinical team or individual providing emergency assistance, and may include on-site and off-site personnel.

Rapid response system (RRS) calls – refers to the presence of either a RRS call record form in the patient's health record or documented evidence by the RRS leader who coordinated the RRS consultation. Documentation should at least address:

- Patient identification details;
- Time and date of RRS call;
- Primary reason for RRS call;
- Observations at time of RRS team arrival;
- Interventions implemented by RRS team;
- RRS team details; and
- RRS call outcomes, including implementation of limitations of medical treatment⁷.

Discharged patients from the ICU **include** patients that were readmitted but **exclude** patients who died while in the ICU.

The **time frame of 72 hours** is an arbitrary measure, which aims to identify deficiencies in patient management rather than complications / progression of the disease process.

Paediatric and neonatal patients are excluded from all indicators in this set. Adult patients are those over the age of 15 years and 364 days.

Suggested Data Collection

Interrogation of the rapid response system database.

References:

¹ Jones D, Bellomo R, DeVita MA. Effectiveness of the medical emergency team: the importance of dose. *Crit Care* 2009; 13(5): 313-317.

² Hillman K. Critical care without walls. *Curr Opin Crit Care* 2002; 8(6): 594-599.

³ DeVita MA, Bellomo R, Hillman K, et al. Finding of the first consensus conference on medical emergency teams. *Crit Care Med* 2006; 34(9): 2463-2478.

⁴ Barbetti J, Lee G. Medical emergency team: a review of the literature. *Nurs Crit Care* 2008;13(2): 80-85.

⁵ Thomas K, VanOyen Force M, Rasmussen D, et al. Rapid response team: challenges, solutions, benefits. *Crit Care Nurs* 2007; 27(1): 20-27.

⁶ Australian Commission on Safety and Quality in Health Care. National Consensus Statement: Essential Elements for Recognising and Responding to Clinical Deterioration. Sydney: Australian Council on Safety and Quality in Health Care; 2010.

⁷ Cretikos M, Parr M, Hillman K, et al. Guidelines for the uniform reporting of data for medical emergency teams. *Resuscitation* 2006; 68(1): 11-25.

INDICATOR

CI. 2.1	Numerator	Total number of rapid response calls to adult ICU patients within 72 hours of being discharged from the ICU , during the 6 month time period.
	Denominator	Total number of adult patients discharged alive from the ICU unit, during the 6 month time period.

<i>This indicator can be used to support the following EQUIP 4 criteria:</i>	
1.1.1	Assessment
1.1.2	Care Planning and Delivery
1.1.4	Evaluation of Care
1.3.1	Appropriateness of Care
1.4.1	Effectiveness of Care

AREA 3: INTENSIVE CARE PATIENT TREATMENT

Indicator Topic

Venous Thromboembolism (VTE) prophylaxis

Rationale

Venous Thromboembolism (VTE), which includes both deep vein thrombosis (DVT) and pulmonary embolism (PE), is a significant cause of morbidity, mortality, and resource expenditure in patients admitted to the ICU¹. Virtually all hospitalised patients have at least one risk factor for VTE, 40% have three or more risk factors, and critically ill patients admitted to ICU possess multiple risk factors related to their illness (impaired cardiopulmonary reserve, respiratory failure, cardiac failure), their ICU admission (prolonged immobilisation from mechanical ventilation, sedation, haemodynamic compromise), the subsequent need to perform invasive tests and procedures (central venous catheterisation, chest tube placement), and other factors that increase their susceptibility (use of vasopressors, presence of sepsis, increasing age over 40 years)¹⁻³.

DVT, used as a surrogate for PE risk in most studies, is virtually unrecognised in patients admitted to ICU, and due to their clinical status (intubation, sedation, altered mental status) often masking some of the common symptoms suggestive of VTE, 10 to 100% of DVTs are clinically silent³⁻⁵. With time, nearly a third of untreated calf vein thrombi extend proximally into the thigh, and if untreated, creates a 40-50% risk of PE⁵. In addition to a mortality rate of at least 25%, untreated PE also increases the likelihood of requiring mechanical ventilation, the duration of time of mechanical ventilation, and contributes to difficulty when weaning critically ill patients from mechanical ventilation⁴⁻⁵. To further complicate the issue, as their critical illness resolves, patients who survive to ICU discharge continue to be at risk for VTE, particularly in neurosurgical patients⁶.

Whilst VTE is a common and potentially lethal complication of ICU hospitalisation, risk stratification screening tools and diagnostic tests are not reliable in this cohort⁶. Thromboprophylaxis is the preferred approach, given its benefit-to-risk ratio and cost-effectiveness, yet effective VTE prevention options have been widely reported to be under-utilised and inconsistently applied^{2,7}. Vigilant and constant assessment by ICU clinicians for signs of VTE is still warranted, however, as patients who receive prophylaxis are still at risk (albeit half) of developing proximal DVT, compared with those who do not receive prophylaxis⁴. VTE prophylaxis includes both mechanical (graduated compression stockings or intermittent pneumatic compression devices) and pharmacological (anticoagulation such as unfractionated heparin, low molecular weight heparin, fondaparinux, and danaparoid) approaches⁷⁻⁸.

Type of Indicator

This is a rate-based indicator addressing the process of patient care.

Desired Rate

3.1 – High

Definition of Terms

For the purpose of Indicator 3.1

VTE prophylaxis refers to one or a combination of graduated compression stockings, intermittent pneumatic compression devices, or pharmacological therapies such as unfractionated heparin, low molecular weight heparin, and so on. **VTE prophylaxis** is prescribed according to the organisation's local protocol, which should describe **indications** and **contraindications**.

Note:

- Data should be **recorded at 24 hours** as part of the national Australian and New Zealand Intensive Care Society (ANZICS) Centre for Outcome and Resource Evaluation (CORE) Adult Patient Database (APD) data collection.
- Whilst it is recognised that **VTE prophylaxis may be contraindicated in some patients**, it is expected that all ICU admissions, regardless of their length of stay, would have some consideration for VTE prophylaxis. The number of patients for which VTE prophylaxis is contraindicated is likely to be **very small and not influential of the overall measure**. Given the difficulty placed on ICU staff to follow up a large number of the medical records (to review appropriateness of VTE prophylaxis) in order to identify an extremely small number of patients (in which VTE prophylaxis is contraindicated), the denominator will comprise total ICU admissions for ease of collection.

Paediatric and neonatal patients are excluded from all indicators in this set. Adult patients are those over the age of 15 years and 364 days.

Suggested Data Collection

Interrogation of the intensive care unit information system. This data is also entered into the ANZICS CORE APD.

References:

- ¹ Pastores SM. Management of venous thromboembolism in the intensive care unit. *J Crit Care* 2009; 24(2): 185-191.
- ² Geerts WH, Pineo GF, Heit JA, et al. Prevention of venous thromboembolism: American College of Chest Physicians evidence-based clinical practice guidelines (8th ed). *Chest* 2008; 133(6): 381S-453S.
- ³ Chan CM, Shorr AF. Venous thromboembolic disease in the intensive care unit. *Semin Respir Crit Care Med* 2010; 31(1): 39-46.
- ⁴ Cook DJ, Crowther MA, Meade MO, et al. Prevalence, incidence, and risk factors for venous thromboembolism in medical-surgical intensive care unit patients. *J Crit Care* 2005; 20(4): 309-313.
- ⁵ Cook DJ, Crowther MA. Thromboprophylaxis in the intensive care unit: focus on medical-surgical patients. *Crit Care Med* 2010; 38(2): S76-S82.
- ⁶ Muscedere JG, Heyland DK, Cook D. Venous thromboembolism in critical illness in a community intensive care unit. *J Crit Care* 2007; 22(4): 285-289.
- ⁷ National Health and Medical Research Council. Clinical practice guideline for the prevention of venous thromboembolism in patients admitted to Australian hospitals. Melbourne: National Health and Medical Research Council; 2009.
- ⁸ National Health and Medical Research Council. Prevention of venous thromboembolism (VTE) in patients admitted to Australian hospitals: guideline summary. Melbourne: National Health and Medical Research Council; 2009.

INDICATOR

CI. 3.1 Numerator Total number of adult patients being treated appropriately for **VTE prophylaxis**, according to local protocol, **within 24 hours of admission to the ICU**, during the 6 month time period.

Denominator Total number of adult admissions into the ICU, during the 6 month time period.

<i>This indicator can be used to support the following EQulP 4 criteria:</i>	
1.1.1	Assessment
1.1.2	Care Planning and Delivery
1.1.4	Evaluation of Care
1.3.1	Appropriateness of Care
1.4.1	Effectiveness of Care

AREA 4: ICU CENTRAL LINE- ASSOCIATED BLOODSTREAM INFECTION

Indicator Topic

Intensive Care Unit (ICU) Central Line-Associated Bloodstream Infection (CLABSI).

Rationale

While all hospitalised patients are at risk of developing healthcare associated infections (HAI), patients in ICU are at particular risk due to multiple comorbidities, use of broad spectrum antibiotic and steroids, need for surgical procedures, extremes of age (very young and very old), and invasive devices such as central catheters¹⁻³. Nearly one third of all HAIs occur in the ICU, and one of the most significant, common, and largely preventable ICU HAIs is central line-associated bloodstream infection (CLABSI)¹. CLABSI is associated with increased morbidity, mortality, length of stay (up to 6 ICU days and 21 hospital days), and costs²⁻⁸. More than 3,500 CLABSI infections are likely to occur each year in Australia, costing at least an additional \$AUD36.26 million to treat⁴. Mortality from CLABSI varies from 4-20%, potentially resulting in between 140 and 700 patients dying unnecessarily every year, and a minimum of 40,250 extra bed days being occupied because of this preventable complication^{4,9}. Most CLABSIs are preventable by the adoption of a standardised, strict aseptic insertion technique, and appropriate post-insertion care^{5,10}.

The occurrence of healthcare-associated bloodstream infections like CLABSI can be used as a measure of the safety of key clinical practice processes within an ICU. Timely investigation of all CLABSIs should occur to identify potential issues for corrective action. The use of comparative data and feedback to individual hospitals can lead to a reduction in infection rates, and it also can be a guide to monitoring the effectiveness of other interventions and can alert hospitals that have unacceptable rates of CLABSI⁶.

Type of Indicator

These are rate-based indicators addressing the outcome of care, and are reported as the number of events per 1,000 line days.

Desired Rate

4.1 – Low (< 1/1000 line days)

4.2 – Low (< 1/1000 line days)

Definition of Terms

For the purpose of Indicator 4.1

A **central line** is defined as an intravascular catheter that terminates at, or close to, the heart or in one of the great vessels. It can be used for infusion, withdrawal of blood or haemodynamic monitoring. Great vessels are the aorta, pulmonary artery, superior and inferior vena, brachiocephalic veins, internal jugular, subclavian, external iliac and common femoral veins¹².

An introducer (such as a swan sheath left in situ) is considered an intravascular catheter. Neither insertion site nor type of device should determine if it is a central line; it must terminate in a great vessel. Pulmonary artery catheters (and the introducer if left in situ) and haemofiltration catheters, therefore, are all central lines.

Central lines may be further classified as either 'centrally inserted', where the skin entry point is on the trunk of the patient, or 'peripherally inserted (eg. PICC), where the line is inserted through a limb vein¹³.

Calculating Line Days¹⁴:

- When calculating centrally inserted (CI) central line days: count all types of CI central lines in situ in a specific unit during the time period under study;
- Patients with two CI central lines in place for one day are counted as ONE CI central line day;
- When calculating peripherally inserted (PI) central line days: count all types of PI central lines in situ in a specific unit during the time period under study;
- Patients with two PI central lines in place for one day are counted as ONE PI central line day;
- Patients with both CI and PI central lines are counted as ONE CI central line day, as the CI central line has the highest risk of infection.

Central Line-Associated Bloodstream Infection (CLABSI)

A CLABSI event is defined as a bloodstream infection with no other apparent focus of infection where a central line has been in situ within 48 hours of the event¹³.

Note:

- A central line has to be in place at the time of, or within 48 hours before onset of, the event, but there is no minimal time since insertion for it to be considered CLABSI.
- There is to be no other apparent focus/source of the infection.
- The CLABSI event is attributed to ICU if it occurs
 - 48 hours post admission and is associated with a central venous catheter that was inserted prior to the ICU admission.
 - within 48 hours of discharge from ICU if discharged with a central venous catheter in situ¹³.

Note:

- The rate of CLABSI for each of the indicators is expressed per 1000 central line days¹⁴.
- **Paediatric and neonatal patients are excluded from all indicators in this set.** Adult patients are those over the age of 15 years and 364 days.

Suggested Data Collection

Interrogation of appropriate information system (local or national).

References:

- ¹ Harrington G, Richards M, Solano T, et al. Adult intensive care unit acquired infection. In: Cruickshank M, Ferguson J (eds.) Reducing harm to patients from health care associated infections: the role of surveillance. Sydney: Australian Commission on Safety and Quality in Health Care; 2008.
- ² Zack J. Zeroing in on zero tolerance for central line-associated bacteremia. *Am J Infect Control* 2008; 36(10): S176.e1-2.
- ³ Robertson MS, Nichol AD, Higgins AM, et al. Venous Thromboembolism prophylaxis in the critically ill: a point prevalence survey of current practice in Australian and New Zealand intensive care units. *Crit Care Resusc* 2010; 12(1): 9-15.
- ⁴ Collignon P, Dreimanis D, Ferguson J, et al. Bloodstream infection. In Cruickshank M, Ferguson J (eds.) Reducing harm to patients from health care associated infections: the role of surveillance. Sydney: Australian Commission on Safety and Quality in Health Care; 2008.
- ⁵ Pronovost P, Needham D, Berenholtz S, et al. An intervention to decrease catheter-related bloodstream infections in the ICU. *N Engl J Med* 2006; 355(26): 2725-2736.
- ⁶ McBryde ES, Brett S, Russo PL, et al. Validation of statewide surveillance system data on central line-associated bloodstream infection in intensive care units in Australia. *Infect Control Hosp Epidemiol* 2009; 30(11): 1045-1049.
- ⁷ Pronovost PJ, Goeschel CA, Colantuoni E, et al. Sustaining reductions in catheter related bloodstream infections in Michigan intensive care units: observational Study. *Br Med J* 2010; 340 (c309): 1-6.

⁸ Berenholtz SM, Pronovost PJ, Lipsett PA, et al. Eliminating catheter-related bloodstream infections in the intensive care unit. *Crit Care Med* 2004; 32(10): 2014-2020.

⁹ Laupland K, Zygun D, Dele Davies H, et al. Population-based assessment of intensive care unit-acquired bloodstream infections in adults: incidence, risk factors, and associated mortality rate. *Crit Care Med* 2002; 30(11): 2462-2467.

¹⁰ Intensive Care Coordination and Monitoring Unit and the Clinical Excellence Commission. CLAB ICU project: preventing central line infections. www.cec.health.nsw.gov.au/programs/clab-icu.html Accessed 6 August 2010.

¹¹ Office of Safety and Quality. CPI guide: central line associated infection prevention. Perth: Department of Health, Western Australia; 2009. http://www.safetyandquality.health.wa.gov.au/docs/squire/HP11562_CENTRAL_LINE_WEB.pdf Accessed 6 August 2010.

¹² Centers for Disease Control and Prevention. Central line-associated bloodstream infection (CLABSI) event – March 2010. http://www.cdc.gov/nhsn/pdfs/pscmanual/4psc_clabscurrent.pdf Accessed 6 August 2010.

¹³ Healthcare Infection Control Special Interest Group. Central line associated bloodstream infection. http://www.asid.net.au/hicsigwiki/index.php?title=Central_line_associated_bloodstream_infection Accessed 6 August 2010.

¹⁴ Australian Council for Safety and Quality in Health Care. Blood stream infection (BSI) definition. Sydney: Australian Council for Safety and Quality in Health Care; 2004.

INDICATOR

CI. 4.1	Numerator	Total number of Adult ICU-associated CI-CLABSI, during the 6 month time period
	Denominator	Total number of CI central line-days in Adult ICU, during the 6 month time period
CI. 4.2	Numerator	Total number of Adult ICU-associated PI-CLABSI during the 6 month time period
	Denominator	Total number of PI central line-days in Adult ICU, during the 6 month time period

These indicators can be used to support the following EQUIP 4 criteria:			
INDICATORS		CRITERION	
4.1	4.2		
✓	✓	1.1.2	Care Planning and Delivery
✓	✓	1.1.4	Evaluation of Care
✓	✓	1.3.1	Appropriateness of Care
✓	✓	1.4.1	Effectiveness of Care
✓	✓	1.5.2	Infection Control

INDICATOR AREA 5: UTILISATION OF PATIENT ASSESSMENT SYSTEMS

Indicator Topic

Participation in the national Australian and New Zealand Intensive Care Society (ANZICS) Centre for Outcome and Resource Evaluation (CORE) registries of the Adult Patient Database (APD) and the Critical Care Resources Survey (CCRS).

Rationale

ANZICS is the peak professional and advocacy body for medical practitioners specialising in the treatment and management of critically ill patients in public and private hospitals¹. Participation in the national APD provides local and national comparative patient data, while the CCRS provides a more comprehensive review of resources and department activities and is adjusted to include topical items.

Type of Indicator

These are rate-based indicators addressing the process of patient care.

Desired Rate

5.1 – High

5.2 – Not specified

Definitions of Terms

For the purpose of Indicator 5.1

Intensive Care Unit (ICU) 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 conditions.

Refer to **Appendix 3** Minimum Standards for Intensive Care Units IC-1 (2010). Also available at the College of Intensive Care Medicine of Australia and New Zealand (<http://cicm.org.au/policydocs.php>).

The **ANZICS CORE Adult Patient Database (APD)** refers to the adult intensive care patient national dataset.

Paediatric and neonatal patients are excluded from all indicators in this set. Adult patients are those over the age of 15 years and 364 days.

For the purpose of Indicator 5.2

The **ANZICS CORE Critical Care Resources Survey (CCRS)** refers to both adult and paediatric intensive care units. The most recent CCRS survey refers to one completed in the past 12 months, however it is acknowledged that the CCOS may not be conducted by the ANZICS each year.

Paediatric and neonatal patients are excluded from all indicators in this set. Adult patients are those over the age of 15 years and 364 days.

Suggested Data Collection

Participation in both processes.

References:

¹ Australian and New Zealand Intensive Care Society. www.anzics.com.au Accessed 2 September 2010.

INDICATOR

CI. 5.1	Numerator	Total number of adult intensive care submissions to the ANZICS CORE Adult Patient Database with completed information and review of results, during the 6 month time period
	Denominator	Total number of adult admissions into the intensive care unit, during the 6 month time period
CI. 5.2	Question	Have you responded to the most recent ANZICS CORE Critical Care Resources Survey?

<i>These indicators can be used to support the following EQUiP 4 criteria:</i>			
INDICATORS		CRITERION	
5.1	5.2		
✓	✓	1.1.2	Care Planning and Delivery
✓	✓	1.1.4	Evaluation of Care
✓	✓	1.1.8	Health Record Documentation
✓	✓	1.3.1	Appropriateness of Care
✓	✓	1.4.1	Effectiveness of Care

AREA 6: MINIMUM STANDARDS FOR A RAPID RESPONSE SYSTEM (RRS)

Indicator Topic

Recognising and responding to clinical deterioration within an acute health care facility.

Rationale

Serious adverse events are common in hospitalised patients, and these events are usually preceded by warning signs that manifest as deteriorations of vital signs or a change in clinical condition up to 24 hours prior to an in-hospital death, cardiac arrest, or unplanned ICU admission¹⁻⁴. Early recognition of clinical deterioration, followed by prompt and effective action, can avert or minimise the probability of a poor clinical outcome for at-risk patients, and may mean that a lower level of intervention is required to stabilise a patient⁵⁻⁶. The need for early identification of at-risk patients has resulted in the introduction of a Rapid Response System (RRS) in Australia and internationally. This approach involves activation of a specialised Rapid Response Team (RRT) to review patients within less than five minutes that fulfil pre-defined changes in vital signs above or below set criteria⁴. Syndromes commonly triggering a RRS include hypotension, dysrhythmias, respiratory distress, neurologic derangements, oliguria, and concern about a patient's overall condition⁷. The team is activated when a patient develops re-defined degrees of physiological instability that manifest as derangements in vital signs. In addition, any staff member may activate a RRS call if they become concerned about the patient's condition for any reason.

To ensure that an acute health facility has the capacity to obtain appropriate emergency assistance or advice prior to the occurrence of an adverse event, different RRS models have been implemented and include medical emergency teams (METs), critical care outreach, and intensive care liaison nurses⁶. For most facilities, the RRS will include clinicians or teams located within the hospital who provide emergency assistance (such as a MET or a nurse accredited in advanced life support). In some facilities the system may be a combination of on-site and external clinicians or resources (such as the ambulance service or local general practitioner). The nature of the RRS needs to be appropriate to the size, role, resources, and staffing mix of the acute health care facility, however there should be access, at all times, to at least one clinician, either on-site or in close proximity, who can practise advanced life support.

The escalation protocol should include consideration of the needs and wishes of patients with an advance care directive (instructions that consent to, or refuse the future use of specified medical treatments) or where other treatment-limiting decisions have been made (decisions that involve the reduction, withdrawal, or withholding of life-sustaining treatment, and includes not for resuscitation or no cardiopulmonary resuscitation orders)⁶. Events surrounding the call for emergency assistance and actions resulting from the call should be documented in the health care record and considered as part of ongoing quality improvement processes⁶. A process of handover and communication between members of the RRT and the clinicians that provide ongoing support and treatment should be developed.

Type of Indicator

These are rate-based indicators related to the process and outcome of patient care, and are reported as the number of events per 1,000 hospital admissions.

Desired Rate

The optimal emergency calling rate is currently unknown, both overall and for health care organisations with different characteristics, casemix, and patient load. It is possible that a high emergency call rate is desirable, as it may indicate that patients who are deteriorating are being identified and reviewed promptly. Alternatively, a high calling rate may represent a failure of the hospital organisation to develop and implement other quality improvement initiatives that prevent or detect patient deterioration. Most mature RRSs that report positive effects on patient outcomes report an RRT call rate of between 18-50 calls/1000 admissions¹.

- 6.1– Not specified
- 6.2– Not specified
- 6.3 – Low
- 6.4 – Low
- 6.5 – Low

Definitions of Terms

For the purpose of Indicators 6.1 – 6.5

A hospital admission is defined as an episode of care lasting greater than 24 hours.

Same day admissions are excluded.

For the purpose of Indicator 6.1 and 6.2

Rapid response system (RRS) – refers to a system that provides emergency assistance to patients whose condition is deteriorating. It includes an afferent limb (the calling criteria and mechanism of activation) and an efferent limb (which may include a medical emergency team [MET], critical care outreach, or intensive care liaison nurses), that should be linked with governance and quality improvement arms³. The system will include the clinical team or individual providing emergency assistance, and may include on-site and off-site personnel.

Rapid response system (RRS) calls – refers to the presence of either a RRS call record form in the patient's health record or documented evidence by the RRS leader who coordinated the RRS consultation. Documentation should at least address:

- Patient identification details;
- Time and date of RRS call;
- Primary reason for RRS call;
- Observations at time of RRS team arrival;
- Interventions implemented by RRS team;
- RRS team details; and
- RSS call outcomes, including implementation of limitations of medical treatment⁸.

The time frame of **within 24 hours of admission to hospital** is an arbitrary measure, which aims to identify unwell patients that should have been admitted to the ICU.

For the purpose of Indicator 6.3

Cardiopulmonary arrest refers to either cardiac or respiratory arrest.

Cardiac arrest is defined as the absence of pulse and respiratory effort, and unconsciousness, necessitating the commencement of resuscitation in the absence of 'not for resuscitation' orders.

Respiratory arrest is defined as the absence of respiratory effort and the presence of palpable pulse and measurable blood pressure, necessitating the commencement of resuscitation in the absence of 'not for resuscitation' orders.

For the purpose of Indicator 6.4

NFR (not for resuscitation) – refers to documentation in the health record indicating that a decision has been made to forgo any form of resuscitation in the event of cessation of breathing or circulation. This decision should have been made in consultation with the patient/medical power of attorney/next of kin as appropriate.

Note:

- The **denominator figures for Indicators 6.1 – 6.5** are the **same**, as they share the same definition.
- **Paediatric and neonatal patients are excluded from all indicators in this set.** Adult patients are those over the age of 15 years and 364 days.

Suggested Data Collection

Interrogation of the rapid response system database.

References:

- ¹ Jones D, Bellomo R, DeVita MA. Effectiveness of the medical emergency team: the importance of dose. *Crit Care* 2009; 13(5): 313-317.
- ² Hillman K. Critical care without walls. *Curr Opin Crit Care* 2002; 8(6): 594-599.
- ³ DeVita MA, Bellomo R, Hillman K, et al. Finding of the first consensus conference on medical emergency teams. *Crit Care Med* 2006; 34(9): 2463-2478.
- ⁴ Barbetti J, Lee G. Medical emergency team: a review of the literature. *Nurs Crit Care* 2008;13(2): 80-85.
- ⁶ Thomas K, VanOyen Force M, Rasmussen D, et al. Rapid response team: challenges, solutions, benefits. *Crit Care Nurs* 2007; 27(1): 20-27.
- ⁷ Australian Commission on Safety and Quality in Health Care. National Consensus Statement: Essential Elements for Recognising and Responding to Clinical Deterioration. Sydney: Australian Commission on Safety and Quality in Health Care; 2010.
- ⁸ Calzavacca P, Licari E, Tee A, et al. A prospective study of factors influencing the outcome of patients after a medical emergency team review. *Intensive Care Med* 2008; 34(11): 2112-2116.
- ⁹ Cretikos M, Parr M, Hillman K, et al. Guidelines for the uniform reporting of data for medical emergency teams. *Resuscitation* 2006; 68(1): 11-25.

INDICATOR

CI. 6.1	Numerator	Total number of rapid response system calls to adult patients, during the 6 month time period
	Denominator	Total number of adult hospital admissions , during the 6 month time period
CI. 6.2	Numerator	Total number of rapid response system calls to adult patients within 24 hours of admission to hospital, during the 6 month time period
	Denominator	Total number of adult hospital admissions , during the 6 month time period
CI. 6.3	Numerator	Total number of adult patients who have experienced a cardiopulmonary arrest , during the 6 month time period
	Denominator	Total number of adult hospital admissions , during the 6 month time period
CI. 6.4	Numerator	Total number of deaths in adult patients who DO NOT have an NFR (not for resuscitation) order at the time of death, during the 6 month time period
	Denominator	Total number of adult hospital admissions , during the 6 month time period
CI. 6.5	Numerator	Total number of adult deaths in all patients, during the 6 month time period
	Denominator	Total number of adult hospital admissions , during the 6 month time period

These indicators can be used to support the following EQUIP 4 criteria:

INDICATORS					CRITERION	
6.1	6.2	6.3	6.4	6.5		
✓	✓				1.1.1	Assessment
✓	✓	✓	✓	✓	1.1.2	Care Planning and Delivery
✓	✓	✓	✓	✓	1.1.4	Evaluation of Care
✓	✓				1.1.8	Health Record Documentation
✓	✓	✓	✓	✓	1.3.1	Appropriateness of Care
✓	✓	✓	✓	✓	1.4.1	Effectiveness of Care

Intensive Care Indicators Version 4

First Half 2011

Area: 1 Access and Exit Block

Topic: Inability to either admit an adult patient into an Intensive Care Unit (ICU) or discharge an adult patient from an ICU.

1.1 Inability to admit an adult patient in an Intensive Care Unit due to inadequate resources

Numerator Total number of appropriate adult patients (as defined in the manual) referred to an ICU, who have documented evidence by an Intensivist that they could not be admitted to the unit because of inadequate resources, during the 6 month time period	From:	To:	
Denominator Total number of adult admissions into the ICU plus the non-admissions resulting from inadequate resources (that is numerator 1.1), during the 6 month time period			

In collecting and reporting the data for this indicator the definitions in the Users Manual were followed precisely Yes No

Comments:

1.2 Adult elective surgical cases deferred or cancelled due to lack of an ICU bed

Numerator Total number of adult elective surgical cases deferred or cancelled due to lack of an ICU bed, during the 6 month time period.	From:	To:	
Denominator Total number of adult admissions into the ICU plus the non-admissions resulting from deferred or cancelled surgical cases due to lack of an ICU bed (that is numerator 1.2), during the 6 month time period.			

In collecting and reporting the data for this indicator the definitions in the Users Manual were followed precisely Yes No

Comments:

Intensive Care Indicators Version 4

First Half 2011

Area: 2 Intensive Care Patient Management

Topic: Recognising and responding to clinical deterioration within 72 hours of being discharged from an Intensive Care Unit.

2.1 Rapid response calls to adult ICU patients within 72 hours of being discharged from the Intensive Care Unit

Numerator

From:

To:

Total number of rapid response calls to adult ICU patients within 72 hours of being discharged from the ICU, during the 6 month time period.

Denominator

Total number of adult patients discharged alive from the ICU unit, during the 6 month time period.

In collecting and reporting the data for this indicator the definitions in the Users Manual were followed precisely

Yes

No

Comments:

Intensive Care Indicators Version 4

First Half 2011

Area: 3 Intensive Care Patient Treatment

Topic: Venous Thromboembolism (VTE) Prophylaxis

3.1 Adult patients being treated appropriately for VTE prophylaxis, according to local protocol, within 24 hours of admission to the ICU

Numerator

From:

To:

Total number of adult patients being treated appropriately for VTE prophylaxis, according to local protocol, within 24 hours of admission to the ICU, during the 6 month time period.

Denominator

Total number of adult admissions into the ICU, during the 6 month time period.

In collecting and reporting the data for this indicator the definitions in the Users Manual were followed precisely

Yes

No

Comments:

Intensive Care Indicators Version 4

First Half 2011

Area: 4 ICU Central Line-Associated Bloodstream Infection (CLABSI)

Topic: Intensive Care Unit (ICU) Central Line-Associated Bloodstream Infection (CLABSI)

4.1 Adult ICU-associated CI-CLABSI

Numerator
The number of Adult ICU-associated CI-CLABSI, during the time period under study.

From:

To:

Denominator
The number of CI central line-days in Adult ICU, during the time period under study.

In collecting and reporting the data for this indicator the definitions in the Users Manual were followed precisely

Yes

No

Comments:

4.2 Adult ICU-associated PI-CLABSI

Numerator
The number of Adult ICU-associated PI-CLABSI, during the time period under study.

From:

To:

Denominator
The number of PI central line-days in Adult ICU, during the time period under study.

In collecting and reporting the data for this indicator the definitions in the Users Manual were followed precisely

Yes

No

Comments:

Intensive Care Indicators Version 4

First Half 2011

Area: 5 Utilisation of Patient Assessment Systems

Topic: Participation in the national Australian and New Zealand Intensive Care Society (ANZICS) Centre for Outcome and Resource Evaluation (CORE) registries

5.1 Participation in the ANZICS CORE Adult Patient Database

Numerator	From:	To:	
Total number of adult intensive care submissions to the ANZICS CORE Adult Patient Database with completed information and review of results, during the 6 month time period			<input type="text"/>

Denominator			<input type="text"/>
Total number of adult admissions into the intensive care unit, during the 6 month time period			

5.2 Participation in the ANZICS CORE Critical Care Resources Survey

Question	From:	To:	
			<input type="text"/>

Intensive Care Indicators Version 4

First Half 2011

Area: 6 Minimum Standards for a Rapid Response System

Topic: Recognising and responding to clinical deterioration within an acute health care facility.

6.1 Rapid response system calls to adult patients

Numerator
Total number of rapid response system calls to adult patients, during the 6 month time period

From:

To:

Denominator
Total number of adult hospital admissions, during the 6 month time period

6.2 Rapid response system calls to adult patients within 24 hours of admission to hospital

Numerator
Total number of rapid response system calls to adult patients within 24 hours of admission to hospital, during the 6 month time period

From:

To:

Denominator
Total number of adult hospital admissions, during the 6 month time period

6.3 Adult patients who have experienced a cardiopulmonary arrest

Numerator
Total number of adult patients who have experienced a cardiopulmonary arrest, during the 6 month time period

From:

To:

Intensive Care Indicators Version 4

First Half 2011

Area: 6 Minimum Standards for a Rapid Response System

Topic: Recognising and responding to clinical deterioration within an acute health care facility.

6.4 Deaths in adult patients who DO NOT have an NFR (not for resuscitation) order at the time of death

Numerator From: To:
Total number of deaths in adult patients who DO NOT have an NFR (not for resuscitation) order at the time of death, during the 6 month time period

Denominator
Total number of adult hospital admissions, during the 6 month time period

6.5 Adult deaths in all patients

Numerator From: To:
Total number of adult deaths in all patients, during the 6 month time period

Denominator
Total number of adult hospital admissions, during the 6 month time period

APPENDIX 2: ICD-10-AM Codes applicable to the this indicator set**INDICATOR AREA 6: MINIMUM STANDARDS FOR A RAPID RESPONSE SYSTEM (RRS)**

Indicator topic: Recognising and responding to clinical deterioration within an acute health care facility.

CI 6.3	Codes that may assist data collection	For consideration
Numerator	I46.0 Cardiac arrest with successful resuscitation I46.9 Cardiac arrest, unspecified R09.2 Respiratory arrest.	Note: Codes for cardiac arrest are only assigned when resuscitation is initiated regardless of the outcome.
Denominator	No applicable codes	Check patient administration system to identify the number of admissions during the six month period and the age of the patient.

APPENDIX 3: Working Party Membership**AUSTRALIAN AND NEW ZEALAND INTENSIVE CARE SOCIETY (ANZICS)**

Dr Tony Burrell (Chair)	Director, Intensive Care Coordination and Monitoring Unit New South Wales
Prof Ken Hillman	Professor of Intensive Care, University of NSW New South Wales
Dr Dan Mullany	Intensivist, ICU, Prince Charles Hospital Queensland
Dr David Pilcher	Intensivist, ICU, The Alfred Hospital Victoria
Ass Prof Graeme Hart	Director, ICU, Austin Health Victoria
Ass Prof Arthas Flabouris	Intensivist, ICU, Royal Adelaide Hospital South Australia

AUSTRALIAN COMMISSION ON SAFETY AND QUALITY IN HEALTH CARE (ACSQHC)

Dr Nicola Dunbar	Policy Team Manager, ACSQHC New South Wales
Ms Jill Porteous	Director, Safety Quality and Performance WA Country Health Service, Western Australia
Dr Jillann Farmer	Medical Director, Patient Safety Centre Queensland Health, Queensland
Ms Anna Green	Manager, ICU Liaison Department, Western Health Victoria
Dr Daryl Jones	Consultant Intensive Care Specialist, Austin Health Victoria
Ms Lesley Dwyer	Executive Director, Operations Acute & Specialist Services Central Northern Adelaide Health Service South Australia

AUSTRALIAN PRIVATE HOSPITALS ASSOCIATION (APHA)

Dr Peter Lavercombe	Director, ICU, St Andrews War Memorial Hospital Queensland
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AUSTRALIAN COLLEGE OF CRITICAL CARE NURSES (ACCCN)

Ms Gabrielle Hanlon	CLAB Project Manager, ANZICS Victoria
Ms Bernadette Grealy	Clinical Services Coordinator, ICU, Queen Elizabeth Hospital South Australia

CONSUMER ORGANISATION (CHFA)

Ms Janney Wale Consumers Health Forum of Australia
 Australian Capital Territory

NATIONAL CASEMIX AND CLASSIFICATION CENTRE (NCCC)

Ms Bronwyn Graham ICD Author and Educator, University of Wollongong
 New South Wales

HEALTH SERVICES RESEARCH GROUP (HSRG)

Mr Stephen Hancock Statistician, University of Newcastle
 New South Wales

AUSTRALIAN COUNCIL ON HEALTHCARE STANDARDS (ACHS)

Dr Chris Maxwell Clinical Director, Performance & Outcomes Service
 ACHS

Dr Jen Bichel-Findlay Coordinator, Performance & Outcomes Service
 ACHS



**College of Intensive Care Medicine
of Australia and New Zealand**
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MINIMUM STANDARDS FOR INTENSIVE CARE UNITS

This Document outlines the minimum standards relating to work practice/caseload, staffing and operational requirements, design, equipment and monitoring for Level I, II, III and Paediatric Intensive Care Units. The Document IC-13 (2010) – “Recommendations on Standards for High Dependency Units Seeking Accreditation for Training in Intensive Care Medicine” outlines similar minimum standards for High Dependency Units.

LEVELS OF INTENSIVE CARE UNITS

The level of intensive care available should support the delineated role of the particular hospital. The role of the ICU will vary, depending on staffing expertise, facilities and support services as well as the severity of illness and number of patients admitted.

1. LEVEL III INTENSIVE CARE UNIT

A Level III 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 III 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.

A Level III unit should have:

1.1 Work practice/caseload

1.1.1 At least six staffed and equipped beds to adequately discharge clinical, teaching and research commitments consistent with the functioning of an Intensive Care Unit in a tertiary referral centre.

1.1.2 Sufficient clinical workload and case-mix of patients to maintain a high level of clinical expertise and to provide adequate clinical exposure and education of staff, including Intensive Care trainees if relevant. This should normally be more than 300 mechanically ventilated patients per annum.

1.2 Staffing Requirements

- 1.2.1 A medical director who is a Fellow of the College of Intensive Care Medicine. The medical director must have a clinical practice predominantly in Intensive Care Medicine.
 - 1.2.2 Sufficient supporting specialist(s) so that consultant support is always available to the medical staff in the unit. For training units classified as C12 or C24 (refer Document IC-3 "Guidelines for Intensive Care Units seeking Accreditation for Training in Intensive Care Medicine") trainees must be exposed to at least two specialists who are Fellows of the College of Intensive Care Medicine. At least two specialists should have a minimum of 50% involvement in the unit. There should also be sufficient specialist staff to provide for reasonable working hours and leave of all types and to allow the duty specialist to be available exclusively to the unit at all times. The majority of attending specialists in the unit must be Fellows of the College of Intensive Care Medicine.
 - 1.2.3 At least one of the specialists exclusively rostered to the unit at all times. During normal working hours this specialist must be predominantly present in the unit, and at all times be able to proceed immediately to it.
 - 1.2.4 In addition to the attending specialist, at least one registered medical practitioner with an appropriate level of experience exclusively rostered and predominantly present in the unit at all times.
 - 1.2.5 A minimum of 1:1 nursing for ventilated and other similarly critically ill patients, and nursing staff available to greater than 1:1 ratio for patients requiring complex management (e.g. ventricular assist device).
 - 1.2.6 A nurse in charge of the unit with a post registration qualification in intensive care or in the clinical specialty of the unit.
 - 1.2.7 The majority of nursing staff with a post registration qualification in intensive care or in the specialty of the unit.
 - 1.2.8 All nursing staff in the unit responsible for direct patient care being registered nurses.
 - 1.2.9 At least one nurse educator.
 - 1.2.10 Support staff as appropriate, eg. biomedical engineer, clerical and scientific staff.
- 1.3 **Operational Requirements**
- 1.3.1 Defined management, admission, discharge and referral policies.
 - 1.3.2 Demonstrable and documented formal audit and review of its activities and outcomes with staff who have dedicated time to collect and manage data.
 - 1.3.3 A documented orientation program for new staff.
 - 1.3.4 Educational programs for medical staff, and a formal nursing education program.
 - 1.3.5 An active research program, preferably with staff who have dedicated time to collect and manage data.
 - 1.3.6 Suitable infection control and isolation procedures and facilities.

1.3.7 24 hour access to pharmacy, pathology, operating theatres and tertiary level imaging services, and appropriate access to physiotherapy and other allied health services when necessary.

1.3.8 Appropriate clerical and secretarial support.

1.4 **Design**

1.4.1 A self-contained area, with easy access to the emergency department, operating theatres and organ imaging.

1.4.2 An appropriate design, providing a suitable environment with adequate space for patient care delivery, storage, staff accommodation (including office space), education and research.

1.5 **Equipment and Monitoring**

Equipment and monitoring of appropriate type and quantity suitable for the function of the unit and appropriate as judged by contemporary standards.

1.6 **Suitability for training**

Only Level III units may apply for accreditation as C24 training units, but may also apply for C6 or C12 accreditation (refer Document IC-3 "Guidelines for Intensive Care Units seeking Accreditation for Training in Intensive Care Medicine").

2. **LEVEL II INTENSIVE CARE UNIT**

A Level II 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.

A Level II unit should have:

2.1 **Work practice/caseload**

2.1.1 At least 4 staffed and equipped beds to adequately discharge clinical and teaching functions.

2.1.2 Sufficient clinical workload for maintaining clinical expertise and to provide adequate clinical exposure and education of intensive care staff, including trainees if relevant. This should normally be more than 200 mechanically ventilated patients per annum.

2.2 **Staffing requirements**

2.2.1 A medical director who is a Fellow of the College of Intensive Care Medicine. The medical director must have a clinical practice predominantly in intensive care medicine.

- 2.2.2 At least one other specialist who is a Fellow of the College of Intensive Care Medicine¹.
- 2.2.3 Sufficient specialist staff to provide reasonable working hours and leave of all types and to allow the duty specialist to be rostered and available exclusively to the unit.
- 2.2.4 In addition to the attending specialist, at least one registered medical practitioner with an appropriate level of experience exclusively rostered and predominantly present in the unit at all times.
- 2.2.5 A nursing staff: patient ratio of 1:1 for all critically ill patients.
- 2.2.6 A nurse in charge of the unit with a post registration qualification in intensive care or in the clinical specialty of the unit.
- 2.2.7 The majority of nursing staff with a post registration qualification in intensive care or in the specialty of the unit.
- 2.2.8 All nursing staff in the unit responsible for direct patient care being registered nurses.
- 2.2.9 Access to a nurse educator.
- 2.2.10 Support staff as appropriate, eg. biomedical engineer, clerical and scientific staff.

2.3 **Operational Requirements**

- 2.3.1 Defined management, admission, discharge and referral policies.
- 2.3.2 Demonstrable and documented formal audit and review of its activities and outcomes, with staff who have dedicated time to collect and manage data.
- 2.3.3 A documented orientation program for new staff.
- 2.3.4 Educational programs for medical staff, and a formal nursing education program.
- 2.3.5 Suitable infection control and isolation procedures and facilities.
- 2.3.6 24 hour access to pharmacy, pathology, operating theatres and imaging services commensurate with the designated role of the hospital, and appropriate access to physiotherapy and other allied health services when necessary.
- 2.3.7 An active research program is desirable.

2.4 **Design**

- 2.4.1 A self-contained area, with easy access to the emergency department, operating theatres and organ imaging.
- 2.4.2 Appropriate design, providing a suitable environment with adequate space for patient care delivery, storage, staff accommodation (including office space), education and research.

¹ The College of Intensive Care Medicine acknowledges that recruitment of Fellows of the College to rural units may be difficult and would support the designation Level II for a rural ICU if this were the only deficiency and if genuine attempts had been made at recruitment of suitable personnel.

2.5 **Equipment and Monitoring**

Equipment and monitoring of appropriate type and quantity suitable for the function of the unit and appropriate as judged by contemporary standards.

2.6 **Suitability for training**

Level II units may apply for maximum accreditation as C12 training units, but may also apply for C6 accreditation (refer Document IC-3 "Guidelines for Intensive Care Units seeking Accreditation for Training in Intensive Care Medicine").

3. **LEVEL I INTENSIVE CARE UNIT**

A Level I 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. Provision of 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 II or Level III 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 I unit must be referred to the Medical Director of the unit or the specialist taking responsibility for the unit at the time of admission.

The patients most likely to benefit from Level I care include:

- a) Patients with uncomplicated myocardial ischaemia.
- b) Post-surgical patients requiring special observations and care.
- c) Unstable medical patients requiring special observations and care beyond the scope of a conventional ward, and
- d) Patients requiring short term mechanical ventilation.

3.1 **Work practice/caseload**

The number of ICU beds and number of patients' admissions should be sufficient to maintain clinical skills by both medical and nursing staff.

A Level I unit should have:

3.2 **Staffing Requirements**

3.2.1 A medical director who is experienced in intensive care medicine.

3.2.2 Consultant support, always available from a specialist with experience in intensive care medicine.

3.2.3 In addition to the attending specialist, at least one registered medical practitioner with an appropriate level of experience, rostered for the intensive care unit at all times.

3.2.4 A nursing staff: patient ratio of 1:1 for all critically ill patients.

- 3.2.5 A nurse in charge of the unit with a post registration qualification in intensive care or in the clinical specialty of the unit.
- 3.2.6 The majority of nursing staff with a post registration qualification in intensive care or in the specialty of the unit.
- 3.2.7 All nursing staff in the unit responsible for direct patient care being registered nurses.
- 3.2.8 Support staff as appropriate, eg. biomedical engineer, clerical and scientific staff.
- 3.2.9 A minimum of two registered nurses present in the unit at all times when there is a patient admitted to the unit.

3.3 **Operational Requirements**

- 3.3.1 Defined management, admission, discharge and referral policies.
- 3.3.2 Demonstrable and documented formal audit and review of its activities and outcomes.
- 3.3.3 A documented orientation program for new staff.
- 3.3.4 Educational programs for medical staff, and a formal nursing education program.
- 3.3.5 Suitable infection control and isolation procedures and facilities.
- 3.3.6 24 hour access to pharmacy, pathology, operating theatres and imaging services commensurate with the designated role of the hospital, and appropriate access to physiotherapy and other allied health services when necessary.
- 3.3.7 An active research program is desirable.

3.4 **Design**

- 3.4.1 A self-contained area, with easy access to the emergency department, operating theatres and organ imaging.
- 3.4.2 Appropriate design, providing a suitable environment with adequate space for patient care delivery, storage, staff accommodation (including office space), education and research.

3.5 **Equipment and Monitoring**

The type and quantity of equipment and monitoring suitable for the function of the unit and appropriate as judged by contemporary standards.

3.6 **Suitability for training**

Level I units are ineligible to apply for accreditation for training in Intensive Care Medicine.

4. **PAEDIATRIC INTENSIVE CARE UNIT**

A tertiary referral Paediatric Intensive Care Unit (PICU) should be capable of providing comprehensive critical care including complex multi-system life support for an indefinite

period to children less than 16 years. These units should have a commitment to academic education and research. All patients admitted to the unit must be referred for management to the attending intensive care specialist.

A PICU should have:

4.1 Work practice/caseload

4.1.1 Sufficient staffed and equipped beds (usually a minimum of six beds) to provide for its clinical and teaching functions.

4.1.2 Sufficient clinical workload to maintain clinical expertise (usually a minimum of 300 patient admissions per annum).

4.2 Staffing Requirements

4.2.1 A medical director who is a Fellow of the College of Intensive Care Medicine. The medical director should have a clinical practice predominantly in paediatric intensive care medicine.

4.2.2 Sufficient supporting specialist(s) so that consultant support is always available to the medical staff in the unit. For training units classified as C12 or C24 (refer Document IC-3 "Guidelines for Intensive Care Units seeking Accreditation for Training in Intensive Care Medicine") trainees must be exposed to at least two specialists who are Fellows of the College of Intensive Care Medicine. At least two specialists should have a minimum of 50% involvement in the unit. There should also be sufficient specialist staff to provide for reasonable working hours and leave of all types and to allow the duty specialist to be available exclusively to the unit at all times. The majority of attending specialists in the unit should be Fellows of the College of Intensive Care Medicine.

4.2.3 At least one of the specialists exclusively rostered to the unit at all times. During normal working hours this specialist must be predominantly present in the unit, and at all times be able to proceed immediately to it.

4.2.4 In addition to the attending specialist, at least one registered medical practitioner with an appropriate level of experience exclusively rostered and predominantly present in the unit at all times.

4.2.5 A minimum of 1:1 nursing for ventilated and other similarly critically ill patients, and nursing staff available to greater than 1:1 ratio for patients requiring complex management (e.g. ventricular assist device).

4.2.6 A nurse in charge of the unit with a post registration qualification in intensive care or in the clinical specialty of the unit.

4.2.7 The majority of nursing staff with a post registration qualification in intensive care or in the specialty of the unit.

4.2.8 All nursing staff in the unit responsible for direct patient care being registered nurses.

4.2.9 At least one nurse educator.

4.2.10 Support staff as appropriate, eg biomedical engineer, clerical and scientific staff.

4.3 **Operational Requirements**

- 4.3.1 Defined management, admission, discharge and referral policies.
- 4.3.2 Demonstrable and documented formal audit and review of its activities and outcomes with staff who have dedicated time to collect and manage data.
- 4.3.3 A documented orientation program for new staff.
- 4.3.4 Educational programs for medical staff, and a formal nursing education program.
- 4.3.5 An active research program, preferably with staff who have dedicated time to collect and manage data.
- 4.3.6 Suitable infection control and isolation procedures and facilities.
- 4.3.7 24 hour access to pharmacy, pathology, operating theatres and tertiary level imaging services, and appropriate access to physiotherapy and other allied health services when necessary.

4.4 **Design**

- 4.4.1 A self-contained area, with easy access to the emergency department, operating theatres and organ imaging.
- 4.4.2 Appropriate design, providing a suitable environment with adequate space for patient care delivery, storage, staff accommodation (including office space), education and research.

4.5 **Equipment and Monitoring**

Equipment and monitoring of appropriate type and quantity suitable for the function of the unit and appropriate as judged by contemporary standards.

4.6 **Suitability for training**

Paediatric ICU's may apply for accreditation of training as C6, C12 or C24 units as detailed in Document IC-3 "Guidelines for Intensive Care Units seeking Accreditation for Training in Intensive Care Medicine".

GENERIC REQUIREMENTS FOR INTENSIVE CARE UNITS

An Intensive Care Unit (ICU) 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.

An ICU provides resources for the support of patients and their families, and utilises the specialised skills of medical, nursing and other staff experienced in the management of critically ill patients. These skills and resources, necessary to care for the critically ill, are most efficiently concentrated in one area of the hospital. This does not preclude the division of one ICU into a higher level (eg for ventilated patients) and lower or "step-down" level (eg for post-operative patients), nor does it preclude the siting of specific high dependency areas elsewhere in the hospital (eg neurosurgical, post-operative cardiothoracic area). Neonatal and Paediatric

Intensive Care Units and Coronary Care Units should preferably be separate from general ICU's. However, coronary care patients and children are effectively managed in general ICU's, where necessary.

Within each unit, policies should be available which detail the admission and discharge criteria of patients. There should also be protocols for retrieving patients, and for transferring patients to other intensive care units for more comprehensive patient care when necessary.

5. STAFFING

The concentration of staff and equipment to care for critically ill patients in one area of the hospital encourages efficient use of expertise and limited resources.

5.1 Medical Staff

The medical director of Level II and III units and paediatric units and the majority of all senior medical staff appointed to Level III units and paediatric units, should be Fellows of the College of Intensive Care Medicine. Sufficient specialist staff with experience in intensive care to provide for administration, teaching, research, reasonable working hours and leave of all types are necessary. Except for Level I units, there must be at least one specialist exclusively rostered to the unit at all times together with 24 hour full-time junior medical staff with an appropriate level of experience rostered exclusively at all times. In Level III units and Paediatric units there must be access to a broad range of specialty consultants.

5.2 Nursing Staff

The nursing staff: patient ratio and the total number of nursing staff required by each unit depends on many variables such as the total number of patients, severity of illness of patients, the method of rostering staff on 8 or 12 hour shifts, as well as individual policies for support and monitoring in each unit. All nurses involved in direct patient care should be registered nurses and the nurse in charge and the majority of nursing staff in each unit should have a post registration qualification in intensive care or in the specialties of the unit. Level I & II units should be capable of providing a nursing staff patient ratio of 1:1 for all critically ill patients. Level III units and Paediatric units should be capable of providing nursing care to greater than 1:1 ratio for critically ill or unstable patients.

An artificially ventilated patient needs at least one nurse at the bedside at all times. A ventilated patient with more complex support such as renal replacement therapy and inotropic support may need two nurses per patient for at least some of the shift. Others such as post-operative patients admitted for overnight monitoring and treatment with a continuous epidural and supplemental oxygen, may require only one nurse per 2-3 patients. Allowances must be made for meal breaks, handover times, holidays, sickness, study leave, etc.

5.3 Other Staff

Depending on the needs of the unit, physiotherapists, radiographers, dieticians, technicians, including biomedical engineering and scientific officers, cleaning staff, social workers, occupational therapists, interpreters, pastoral, secretarial and clerical staff are all required. Secretarial services should be available to support educational and administrative activities. These should be separate from ward clerk duties in the ICU.

5.4 Educational

The unit should have a documented educational program for medical, nursing and other staff. Level III units and Paediatric units should have a nurse educator and formal nursing educational program. Level II units should have access to a nurse educator.

6. OPERATIONAL

All units should have defined policies for admission, management, discharge and referral of patients. All units should be under the direction of a specialist in intensive care medicine. This person should institute agreed policies, develop a team approach for management and be responsible to the hospital administration through appropriate channels. Clinical management of the patient must be achieved within the framework of agreed policies (eg. procedural and infection control, including defined antibiotic policies). All units should have documented and demonstrable procedures for formal audit, peer review and quality assurance. Services required on a 24 hour basis include imaging, laboratory and other diagnostic facilities. Except for Level I units, all patients admitted must be referred for management to the attending intensive care specialist. Level III units and paediatric units must have an active research program. In Level II units, an active research program should be encouraged.

7. STRUCTURE OF AN ICU

7.1 Siting

The ICU should be a separate unit within the hospital with access to the emergency department, operating theatres and organ imaging on campus.

7.2 Design

A high standard of intensive care medicine is influenced by good design and adequate space. Whenever renovations or new structures are being planned there are certain features which should be considered.

7.2.1 *Patient Area* – in adult intensive care units at least 20m² floor area is required for each bedspace in an open area exclusive of service areas and circulation space as indicated below. Paediatric units may utilise less than 20m² when utilising cots rather than beds. At least one wash basin for every two beds is recommended and one for each bedspace is preferred. At least one single room should be available for every six open space beds. Each single room needs to have its own wash basin. There must be an adequate number of service outlets depending on the purpose of the unit. A Level III unit will require at least three oxygen, two air and three suction outlets, and at least 16 power points for each bedspace. The electrical wiring and protection of patient treatment areas must be Cardiac Protected Status AS3003. Adequate and appropriate lighting for clinical observation must be available. Service outlets and lighting must comply with standards prescribed by the appropriate authority. For the psychological well-being of patients and staff, windows and bed access to the exterior are desirable features. Design of the unit should take into account the need for patient privacy.

7.2.2 *Working Area* – the working area must include adequate space for staff to work in comfort while maintaining visual contact with the patient. Adequate space must be allowed for patient monitoring, resuscitation equipment, and medical storage areas (including a refrigerator). The unit needs space for a mobile x-ray machine, and associated equipment. The x-ray viewing facilities must enable simultaneous viewing of multiple x-rays. There should be adequate room for telephones and other

communication systems, computers and data collecting, also for the storage of stationery. Adequate space for a receptionist and/or ward clerk must be available.

- 7.2.3 *Environment* – the unit should have appropriate air conditioning which allows control of temperature, humidity and air change.
- 7.2.4 *Isolation area* – the unit must be capable of isolation procedures.
- 7.2.5 *Equipment storage area* – eg. for monitors, ventilators, infusion pumps and syringes, dialysis equipment, disposables, fluids, drip stands, trolleys, blood warmers, suction apparatus, linen, large items of special equipment.
- 7.2.6 *Dirty utility* – area for cleaning appliances, urine testing, emptying and cleaning bed pans and urine bottles. Unit design should provide appropriate movement pathways for contaminated equipment.
- 7.2.7 *Staff Facilities* – should be sited close to the patient area and have adequate communication with it.
- 7.2.8 *Seminar Room* – should be situated close to the patient area with adequate communication and be equipped with seating, audiovisual aids, wall boards and other teaching aids.
- 7.2.9 *Nursing Offices* – separate offices must be provided at least for the Nurse in Charge and Nurse Educator.
- 7.2.10 *Medical Offices* – each senior doctor should have adequate office space. There should be adequate office space for junior medical staff to perform educational, research or clerical work during quiet clinical periods.
- 7.2.11 *Relatives' area* – a separate waiting area must be available (with drinks dispenser, radio, television and comfortable seating desirable). A separate interview room and a separate area for distressed relatives should be available and overnight rooms for relatives should also be considered.
- 7.2.12 *Secretarial area* – a separate area should be available for departmental secretarial assistance. Records storage has to be accommodated.
- 7.2.13 *Computing facilities* – a separate area should be designated for computerised patient data entry and analysis. Confidentiality should be built into any system.
- 7.2.14 *Cleaners' area* – for storage of equipment and materials.
- 7.2.15 *Workshop and Laboratory* – should be considered for any unit which does not rely on centralised services.
- 7.2.16 *Library facilities* – an appropriate range of bench manuals, textbooks, journals and access to electronic medical information should be available 24 hours a day within the unit complex.

8. EQUIPMENT

- 8.1 The type and quantity of equipment will vary with the type, size and function of the unit and must be appropriate to the workload of the unit, judged by contemporary standards.

8.2 There must be a regular system in force for checking the safety of equipment.

8.3 Basic equipment should include:

- ventilators
- hand ventilating assemblies
- suction apparatus
- airway access equipment, including bronchoscopic equipment
- vascular access equipment
- monitoring equipment, both non-invasive and invasive
- defibrillation and pacing facilities
- equipment to control patient's temperature
- chest drainage equipment
- infusion and specialised pumps
- portable transport equipment
- specialised beds

Other equipment (eg. renal replacement therapy and intra-aortic balloon counterpulsation etc.) for specialised diagnostic or therapeutic procedures should be available when clinically indicated and in order to support the delineated role of the ICU.

Protocols and in-service training for medical and nursing staff need to be available for the use of all equipment, including steps to be taken in the event of malfunction.

9 MONITORING

Adequate monitoring is a core capability of all Intensive Care Units.

The described monitoring methods below are not meant to replace vigilance by medical and nursing staff in the unit and may fail to detect unfavourable clinical developments. Furthermore, it is understood that the use of monitoring does not guarantee any specific patient outcome.

The health care facility is responsible for provision of equipment for intensive care and monitoring on the advice of one or more designated intensive care specialists, and for effective maintenance of this equipment.

9.1 Personnel

Clinical monitoring by a vigilant nurse is the basis of intensive patient care. This should be supplemented by appropriate devices to assist the nurse.

9.2 Patient Monitoring

9.2.1 *Circulation*

The circulation must be monitored at frequent and clinically appropriate intervals by detection of the arterial pulse, ECG display and measurement of the arterial blood pressure.

9.2.2 *Respiration*

Respiratory function should be assessed at frequent and clinically appropriate intervals by observation, supported by capnography and blood gas analysis.

9.2.3 *Oxygenation*

The patient's oxygenation should be assessed at frequent and clinically appropriate intervals by observation, pulse oximetry and blood gas analysis as appropriate.

9.3 **Equipment (including portable equipment used for patient transports)**

9.3.1 *Piped gas supply failure alarm* - There must be piped gas supply failure alarms.

9.3.2 *Oxygen supply failure alarm* - An automatically activated device to monitor oxygen supply pressure and to warn of low pressure must be fitted to ventilators.

9.3.3 *Oxygen analyser* - An oxygen analyser must be available to measure the oxygen concentration delivered by ventilators or breathing systems.

9.3.4 *Alarms for Breathing System Disconnection or Ventilator Failure* - When an automatic ventilator is in use, a device capable of warning promptly of a breathing system disconnection or ventilator failure must be in continual operation.

9.3.5 *Ventilator volumes and pressures* - When a ventilator is in use, ventilatory volumes should be measured although it is accepted that this is not always possible with some ventilators used for paediatric and neonatal patients. Airway and respiratory circuit pressure must be monitored continuously and prompt warning given of excessive pressures.

9.3.6 *Humidifier temperature* - When a heated humidifier is in use monitoring of the inspired temperature must be available which alarms at high temperature.

9.3.7 *Electrocardiograph* - Equipment to monitor and continually display the electrocardiograph must be available for every patient.

9.3.8 *Pulse Oximeter* - A pulse oximeter must be available for every patient in the Intensive Care Unit.

9.3.9 *End tidal CO₂ monitor* - Capnography must be available at each bed in the Intensive Care Unit and must be used to confirm tracheal placement of the endotracheal or tracheostomy tube immediately after insertion.

Continuous end tidal CO₂ monitoring should be used in all patients treated with neuromuscular blocking agents and during patient transport

9.3.10 *Air embolism* - When a patient is treated by renal replacement therapy, plasmapheresis or circulatory perfusion, monitoring for air embolism must be in use.

9.3.11 *Other Equipment* - When clinically indicated, equipment must be available to measure other physiological variables such as intra-arterial and pulmonary artery pressures, cardiac output, inspiratory pressure and air flow, intracranial pressure, temperature and neuromuscular transmission.

These guidelines should be interpreted in conjunction with the following Documents of the College of Intensive Care Medicine:

- IC-2 "Intensive Care Specialist Practice in Hospitals Accredited for Training in Intensive Care Medicine"
- IC-3 "Guidelines for Intensive Care Units seeking Accreditation for Training in Intensive Care Medicine"
- IC-4 "The Supervision of Vocational Trainees in Intensive Care Medicine"
- T-10 "The Role of Supervisors of Training in Intensive Care Medicine"
- IC-7 "Administrative Services to Intensive Care Units"
- IC-13 "Recommendations on Standards for High Dependency Units Seeking Accreditation for Training in Intensive Care Medicine"

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national consensus statement:

essential elements for recognising &
responding to clinical deterioration

AUSTRALIAN COMMISSION ON
SAFETY AND QUALITY IN HEALTHCARE



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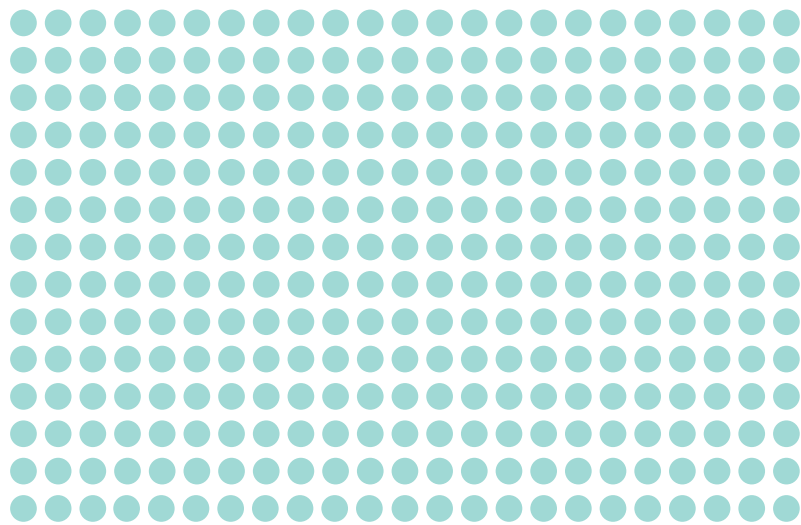
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introduction

Early recognition of clinical deterioration, followed by prompt and effective action, can minimise the occurrence of adverse events such as cardiac arrest, and may mean that a lower level of intervention is required to stabilise a patient.

The evidence base regarding recognition and response systems for clinical deterioration is still developing. This document has been developed as a consensus statement reflecting the agreed views of experts in the field and the Australian Commission on Safety and Quality in Health Care. It has been derived from expert experience and published evidence. Guidelines and documents that have informed the Consensus Statement are listed at the end of the Statement on page 20.

In April 2010, Health Ministers endorsed the Consensus Statement as the national approach for recognising and responding to clinical deterioration in acute care facilities in Australia.

The purpose of the Consensus Statement is to describe the elements that are essential for prompt and reliable recognition of, and response to, clinical deterioration in acute health care facilities in Australia.

The Statement sets out agreed practice for recognising and responding to clinical deterioration. To achieve this, facilities need to have systems in place to address all elements in the Statement. As a consensus statement, the document represents guidance, rather than mandatory practice.

The Consensus Statement should guide health services in developing their own recognition and response systems in a way that is tailored to their patient population and the resources and personnel available, whilst being in line with relevant jurisdictional or other programs.

A glossary of terms used in this Statement appears on page 19.

scope

The Consensus Statement relates to situations where a patient's physiological condition is deteriorating. The general provision of care in a hospital or other facility is outside the scope of this document.

The Consensus Statement focuses on ensuring that a clinical safety net is in place for patients whose condition is deteriorating, and outlines the organisational supports that are needed to provide this safety net. It does not cover the specific clinical treatments or interventions that may be needed to stabilise a patient.

The Consensus Statement applies to all patients in an acute health care facility, including adults, adolescents, children and babies.

Within the context of the focus on physiological deterioration, the Consensus Statement applies to all types of patients, including medical, surgical, maternity and mental health patients.

The Consensus Statement applies in all types of acute health care facilities, from large tertiary referral centres, to small district and community hospitals. Some elements of the Consensus Statement may be used by services delivered by acute health care facilities in the community (such as hospital in the home programs).

intended audience

The Consensus Statement has been developed for:

- clinicians and managers responsible for the development, implementation and review of recognition and response systems in individual facilities or groups of facilities.
- planners, program managers and policy makers responsible for the development of jurisdictional or other strategic programs dealing with recognition and response to clinical deterioration.

guiding principles

- 1 Recognising patients whose condition is deteriorating and responding to their needs in an appropriate and timely way are essential components of safe and high quality care.
- 2 Recognition and response systems must apply to all patients, in all patient care areas, at all times.
- 3 Primary responsibility for caring for the patient rests with the attending medical officer or team. Recognition and response systems should therefore promote effective action by ward staff and the attending medical officer or team. This includes calling for emergency assistance when required.
- 4 Effectively recognising and responding to deterioration requires appropriate communication of diagnosis, including documentation of diagnosis in the health care record.
- 5 Effectively recognising and responding to deterioration requires development and communication of plans for monitoring of observations and ongoing management of the patient.
- 6 Recognition of and response to deterioration requires access to appropriately qualified, skilled and experienced staff.
- 7 Recognition and response systems should encourage a positive, supportive response to escalation of care, irrespective of circumstances or outcome.
- 8 Care should be patient focused and appropriate to the needs and wishes of the individual and their family or carer.
- 9 Organisations should regularly review the effectiveness of the recognition and response systems they have in place.

essential elements

These elements describe the essential features of the systems of care for recognising and responding to clinical deterioration. The elements do not prescribe how this care should be delivered. Facilities need to have systems in place to address all elements in the Consensus Statement; however the application of the elements in an individual facility will need to be carried out in a way that is relevant to its specific circumstances.

This Statement includes eight essential elements. Four relate to clinical processes that need to be locally delivered, and are based on the circumstances of the facility in which care is provided. Four relate to the structural and organisational prerequisites that are essential for recognition and response systems to operate effectively.

a Clinical processes

1. Measurement and documentation of observations
2. Escalation of care
3. Rapid response systems
4. Clinical communication

b Organisational prerequisites

5. Organisational supports
6. Education
7. Evaluation, audit and feedback
8. Technological systems and solutions





a

clinical processes

1 Measurement & documentation of observations

Measurable physiological abnormalities occur prior to adverse events such as cardiac arrest, unanticipated admission to intensive care and unexpected death. These signs can occur both early and late in the deterioration process. Regular measurement and documentation of physiological observations is an essential requirement for recognising clinical deterioration.

- 1.1** Observations should be taken on all patients in acute care settings.
- 1.2** Observations should be taken on patients at the time of admission or initial assessment.
- 1.3** For every patient, a clear monitoring plan should then be developed that specifies the physiological observations to be recorded and the frequency of observations, taking into account the patient's diagnosis and proposed treatment.
- 1.4** The frequency of observations should be consistent with the clinical situation of the patient. For the majority of patients in an acute health care facility, observations should be taken at least once per eight hour shift. In some clinical circumstances more frequent or less frequent observations will be appropriate and this should be documented in the monitoring plan.
- 1.5** The frequency of observations should be reconsidered and possibly modified according to changes in clinical circumstances.
- 1.6** Physiological observations should include:
 - respiratory rate
 - oxygen saturation
 - heart rate
 - blood pressure
 - temperature
 - level of consciousness

In some circumstances, and for some groups of patients, some observations will need to be

measured more or less frequently than others, and this should be specified in the monitoring plan.

- 1.7** The minimum physiological observations should be documented in a structured tool such as an observation chart.
- 1.8** Observation charts should display information in the form of a graph. An observation chart should include:
 - a system for tracking changes in physiological parameters over time
 - thresholds for each physiological parameter or combination of parameters that indicate abnormality
 - information about the response or action required when thresholds for abnormality are reached or deterioration identified
 - the potential to document the normal physiological range for the patient
- 1.9** Clinicians may choose to document other observations and assessments to support timely recognition of deterioration. Examples of additional information that may be required include fluid balance, occurrence of seizures, pain, chest pain, respiratory distress, pallor, capillary refills, pupil size and reactivity, sweating, nausea and vomiting, as well as additional biochemical and haematological analyses.

2 Escalation of care

An escalation protocol sets out the organisational response required in dealing with different levels of abnormal physiological measurements and observations. This response may include appropriate modifications to nursing care, increased monitoring, review by the attending medical officer or team or calling for emergency assistance from intensive care or other specialist teams.

Primary responsibility for caring for the patient rests with the attending medical officer or team. In this context, the escalation protocol describes the additional safety net that must exist for all patients. Although this safety net should be tailored to the circumstances of the facility, it should include some form of emergency assistance where advanced life support can be provided to patients in a timely way. A protocol regarding escalation of care is an essential requirement for responding appropriately to clinical deterioration.

- 2.1** A formal documented escalation protocol is required that applies to the care of all patients at all times.
- 2.2** The escalation protocol should authorise and support the clinician at the bedside to escalate care until the clinician is satisfied that an effective response has been made.
- 2.3** The escalation protocol should be tailored to the characteristics of the acute health care facility, including consideration of issues such as:
 - size and role (such as whether a tertiary referral centre or small community hospital)
 - location
 - available resources (such as staffing mix and skills, equipment, remote telemedicine systems, external resources such as ambulances)
 - potential need for transfer to another facility
- 2.4** The escalation protocol should allow for a graded response commensurate with the level of abnormal physiological measurements, changes in physiological measurements or other identified deterioration. The graded response should incorporate options such as:
 - increasing the frequency of observations
 - appropriate interventions from the nursing and medical staff on the ward

- review by the attending medical officer or team
- obtaining emergency assistance or advice
- transferring the patient to a higher level of care locally, or to another facility

2.5 The escalation protocol should specify:

- the levels of physiological abnormality or abnormal observations at which patient care is escalated
- the response that is required for a particular level of physiological or observed abnormality
- how the care of the patient is escalated
- the personnel that the care of the patient is escalated to, noting the responsibility of the attending medical officer or team
- who else is to be contacted when care of the patient is escalated
- the timeframe in which a requested response should be provided
- alternative or back up options for obtaining a response

2.6 The way in which the escalation protocol is applied should take into account the clinical circumstances of the patient, including both the absolute change in physiological measurements and abnormal observations, as well as the rate of change over time for an individual patient.

2.7 The escalation protocol may specify different actions depending on the time of day or day of the week, or for other circumstances.

2.8 The escalation protocol should allow for the capacity to escalate care based only on the concern of the clinician at the bedside in the absence of other documented abnormal physiological measurements ('staff member worried' criterion).

2.9 The escalation protocol should allow for the concerns of the patient, family or carer to trigger an escalation of care.

2.10 The escalation protocol should include consideration of the needs and wishes of patients with an advance care directive or where other treatment-limiting decisions have been made.

2.11 The escalation protocol should be promulgated widely and included in education programs.

3 Rapid response systems

Where severe deterioration occurs it is important to ensure that the capacity exists to obtain appropriate emergency assistance or advice prior to the occurrence of an adverse event such as a cardiac arrest. Different models that have been used to provide this assistance include medical emergency teams (METs), critical care outreach and intensive care liaison nurses. The generic name for this type of emergency assistance is a 'rapid response system'. The emergency assistance provided as part of a rapid response system is additional to the care provided by the attending medical officer or team.

For most facilities, the rapid response system will include clinicians or teams located within the hospital who provide emergency assistance (such as a MET or a nurse accredited in advanced life support). In some facilities the system may be a combination of on-site and external clinicians or resources (such as the ambulance service or local general practitioner). However comprised, and however named, a rapid response system should form part of an organisation's escalation protocol.

3.1 Some form of rapid response system should exist to ensure that specialised and timely care is available to patients whose condition is deteriorating.

3.2 Criteria for triggering the rapid response system should be included in the escalation protocol.

- 3.3** The nature of the rapid response system needs to be appropriate to the size, role, resources and staffing mix of the acute health care facility.
- 3.4** The clinicians providing emergency assistance as part of the rapid response system should:
- be available to respond within agreed timeframes
 - be able to assess the patient and provide a provisional diagnosis
 - be able to undertake appropriate initial therapeutic intervention
 - be able to stabilise and maintain the patient pending definitive disposition
 - have authority to make transfer decisions and to access other care providers to deliver definitive care
- 3.5** As part of the rapid response system there should be access, at all times, to at least one clinician, either on-site or in close proximity, who can practise advanced life support.
- 3.6** The clinicians providing emergency assistance should have access to a staff member of sufficient seniority to make treatment-limiting decisions. Where possible these decisions should be made with input from the patient, family and the attending medical officer or team.
- 3.7** In cases where patients need to be transferred to another site to receive emergency assistance, appropriate care needs to be provided to support them until such assistance is available.
- 3.8** When a call is made for emergency assistance, the attending medical officer or team should be notified as soon as practicable that the call has been made, and where possible they should attend to support and learn from the clinicians providing assistance.



- 3.9** All opportunities should be taken by the clinicians providing emergency assistance to use the call as an educational opportunity for ward staff and students.
- 3.10** The clinicians providing emergency assistance should communicate in an appropriate, detailed and structured way with the attending medical officer or team about the consequences of the call, including documenting information in the health care record.
- 3.11** Events surrounding the call for emergency assistance and actions resulting from the call should be documented in the health care record and considered as part of ongoing quality improvement processes.
- 4.4** There should be adequate communication and discussion about the wishes of the patient regarding advance care planning, resuscitation and other active treatment.
- 4.5** Structured handover processes, including documentation of handovers, should be used for all patients.
- 4.6** The handover protocol used should include information about the most recent observations and clinical assessment.
- 4.7** Handover procedures should include the identification of patients who are deteriorating and communication of information that is relevant to their management.

4 Clinical communication

Effective communication and team work among clinicians is an essential requirement for recognising and responding to clinical deterioration. Poor communication at handover and in other situations has been identified as a contributing factor to incidents where clinical deterioration is not identified or properly managed. A number of structured communication protocols exist that can be used for handover and as part of ongoing patient management.

- 4.1** Formal communication protocols should be used to improve the functioning of teams when caring for a patient whose condition is deteriorating.
- 4.2** The value of information about possible deterioration from the patient, family or carer should be recognised.
- 4.3** Information about deterioration should be communicated to the patient, family or carer in a timely and ongoing way.

A woman in a white lab coat and safety glasses is looking down at a patient in a clinical setting. The background shows a hospital hallway with a door and some posters on the wall.**b**

organisational prerequisites

5 Organisational supports

Recognition and response systems should be part of standard clinical practice. Nonetheless, the introduction of new systems to optimise care of patients whose condition is deteriorating requires organisational support and executive and clinical leadership for success and sustainability.

- 5.1** A formal policy framework regarding recognition and response systems should exist and should include issues such as:
- governance arrangements
 - roles and responsibilities
 - communication processes
 - resources for the rapid response system, such as staff and equipment
 - training requirements
 - evaluation, audit and feedback processes
 - arrangements with external organisations that may be part of the rapid response system
- 5.2** This policy framework should apply across the acute health care facility, and identify the planned variations in the escalation protocol and responses that might exist in different circumstances (such as for different times of day).
- 5.3** Any new recognition and response systems or procedures should be integrated into existing organisational and safety and quality systems to support their sustainability and opportunities for organisational learning.
- 5.4** Recognition and response systems should encourage staff to react positively to escalation of care, irrespective of circumstances or outcome.



- 5.5** Appropriate policies and documentation regarding advance care directives, treatment-limiting decisions and end-of-life decision making are critical in ensuring that the care delivered in response to deterioration is consistent with appropriate clinical practice and the patient's expressed wishes.
- 5.6** A formal governance process (such as a committee) should oversee the development, implementation and ongoing review of recognition and response systems. If a committee has this role, it should:
- have appropriate responsibilities delegated to it, and be accountable for its decisions and actions
 - monitor the effectiveness of interventions and education
 - have a role in reviewing performance data
 - provide advice about the allocation of resources
 - include consumers, clinicians, managers and executives
- 5.7** Organisations should have systems in place to ensure that the resources required to provide emergency assistance (such as equipment and pharmaceuticals) are always operational and available.

6 Education

Having an educated and suitably skilled and qualified workforce is essential to provide appropriate care to patients whose condition is deteriorating. Education should cover knowledge of observations and identification of clinical deterioration, as well as appropriate clinical management skills. Skills such as communication and effective team work are needed to provide appropriate care to patients whose condition is deteriorating, and should also be part of staff development. The education programs provided by an individual facility should be consistent with the needs

and resources of the organisation, and could be standardised within areas, regions or jurisdictions.

- 6.1** All clinical and non-clinical staff should receive education about the local escalation protocol relevant to their position. They should know how to call for emergency assistance if they have any concerns about a patient, and know that they *should* call under these circumstances. This information should be provided at the commencement of employment and as part of regular refresher training.
- 6.2** All doctors and nurses should be able to:
- systematically assess a patient
 - understand and interpret abnormal physiological parameters and other abnormal observations
 - initiate appropriate early interventions for patients who are deteriorating
 - respond with life-sustaining measures in the event of severe or rapid deterioration, pending the arrival of emergency assistance
 - communicate information about clinical deterioration in a structured and effective way to the attending medical officer or team, to clinicians providing emergency assistance and to patients, families and carers
 - understand the importance of, and discuss, end-of-life care planning with the patient, family and/or carer
 - undertake tasks required to properly care for patients who are deteriorating, such as developing a clinical management plan, writing plans and actions in the health care record and organising appropriate follow up
- 6.3** As part of the rapid response system, competency in advanced life support should be ensured for sufficient clinicians who provide emergency assistance to guarantee access to these skills according to local protocols.

- 6.4** A range of methods should be used to provide the required knowledge and skills to staff. These may include provision of information at orientation and regular refreshers using face-to-face and online techniques, as well as simulation centre and scenario based training.

7 Evaluation, audit & feedback

Evaluation of new systems is important to establish their efficacy and determine what changes might be needed to optimise performance. Ongoing monitoring is necessary to track changes in outcomes over time and to check that these systems are operating as planned.

- 7.1** Data should be collected and reviewed locally and over time regarding the implementation and effectiveness of recognition and response systems.
- 7.2** Recognition and response systems should be evaluated to determine whether they are operating as planned. Evaluation may include checking the existence of required documentation, policies and protocols (such as the escalation protocol) and compliance with policy (such as completion rates of observation charts or proportion of staff who have received mandatory training).
- 7.3** Systems should be evaluated to determine whether they are improving the recognition of and response to clinical deterioration. Evaluation may include collecting and reviewing data about calls for emergency assistance, and adverse events such as cardiac arrests, unplanned admissions to intensive care and unexpected deaths.

7.4 The following data should be collected for each call for emergency assistance that is made to the rapid response system:

- patient demographics
- date and time of call, response time and stand down time
- the reason for the call
- the treatment or intervention provided
- outcomes of the call, including disposition of the patient

This information, as well as information about reviews conducted by the attending medical officer or team, should be included in the health care record.

7.5 Regular audits of triggers and outcomes should be conducted for patients who are the subject of calls for emergency assistance. Where these data are available, this could include longer-term outcomes for patients (such as 30 and 60 day mortality).

7.6 Evaluation of the costs and potential savings associated with recognition and response systems could also be considered.

7.7 Information about the effectiveness of the recognition and response systems may also come from other clinical information such as incident reports, root cause analyses, cardiac arrest calls and death reviews. A core question for every death review should be whether the escalation criteria for the rapid response system was met, and whether care was escalated appropriately.

7.8 As part of the implementation of new systems, feedback should be obtained from frontline staff about the barriers and enablers to change. Issues and difficulties regarding implementation should be considered for different settings.

7.9 Consistent with any implementation process, information collected as part of ongoing evaluation and audit should be:

- fed back to ward staff and the attending medical officer or team regarding their own calls for emergency assistance
- fed back to the clinicians providing emergency assistance
- reviewed to identify lessons that can improve clinical and organisational systems
- used in education and training programs
- used to track outcomes and changes in performance over time

7.10 Indicators of the implementation and effectiveness of recognition and response systems should be monitored at senior governance levels within the organisation (such as by senior executives or relevant quality committees).

8 Technological systems and solutions

In health care, new technologies are constantly being developed that have the potential to improve the safety and quality of care. Some of these are relevant to recognition and response systems, including the use of hand-held computers to collect observations, automatic monitoring of observations and automatic alerts where clinical trigger points are reached. Technology needs to be introduced in such a way that it supports the work of clinicians providing care to patients. The potential risks of technological systems also need to be understood and managed.

- 8.1** Recognition and response systems should consider the inclusion of technological solutions based on evidence of efficacy and cost, as well as consideration of possible additional safety and quality risks. Unintended adverse effects should be considered by explicit study during implementation.
- 8.2** Technological solutions should not place a barrier between the clinician and the patient; instead they should enhance the care process and interaction.
- 8.3** Where technological solutions are introduced, the recognition and response systems should still conform to the elements specified in this Consensus Statement.





glossary



Acute health care facility: A hospital or other health care facility providing health care services to patients for short periods of acute illness, injury or recovery.

Advance care directive: Instructions that consent to, or refuse the future use of specified medical treatments (also known as a health care directive, advance plan or other similar term).

Advanced life support: The preservation or restoration of life by the establishment and/or maintenance of airway, breathing and circulation using invasive techniques such as defibrillation, advanced airway management, intravenous access and drug therapy.

Attending medical officer or team: The treating doctor or team with primary responsibility for caring for the patient.

Definitive disposition: The location, such as a ward or hospital, to which the patient will be transferred after initial stabilisation.

Definitive care: The clinical care required to maintain the stabilisation achieved and, where possible, to restore the patient to health.

Emergency assistance: Clinical advice or assistance provided when the patient's condition has deteriorated severely. This assistance is provided as part of the rapid response system, and is additional to the care provided by the attending medical officer or team.

Escalation protocol: The protocol that sets out the organisational response required for different levels of abnormal physiological measurements or other observed deterioration. The protocol applies to the care of all patients at all times.

Monitoring plan: A written plan that documents the type and frequency of observations to be recorded.

Rapid response system: The system for providing emergency assistance to patients whose condition is deteriorating. The system will include the clinical team or individual providing emergency assistance, and may include on-site and off-site personnel.

Recognition and response systems: Formal systems to support staff to promptly and reliably recognise patients who are clinically deteriorating, and to respond appropriately to stabilise the patient.

Treatment-limiting decisions: Decisions that involve the reduction, withdrawal or withholding of life-sustaining treatment. These may include 'no cardiopulmonary resuscitation' (CPR), 'not for resuscitation' and 'do not resuscitate' orders.

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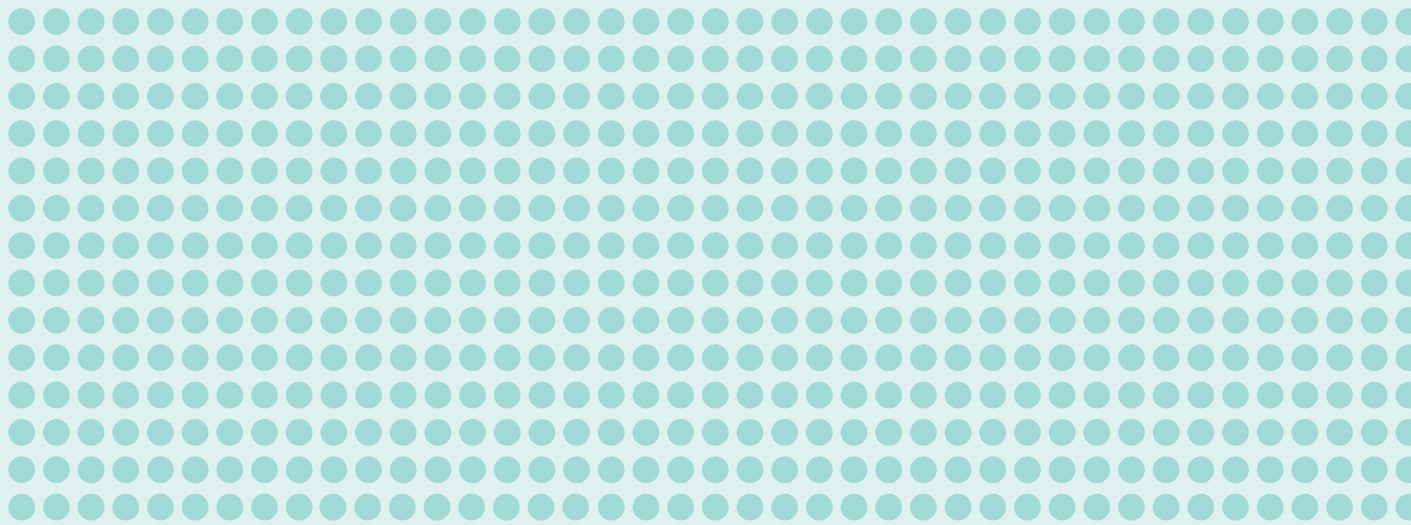
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