

NSW Health
Nursing and Midwifery Office

Transition to Intensive Care Nursing Project

Steering Group Report

January 2008

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Background

Recruitment of registered nurses (RNs) to work in critical care and the retention of an experienced critical care workforce have been identified as a significant issues across Australia in general and particularly in rural areas. (1, 2)

Supporting the transition of nurses to specialty practice has been identified as a key strategy in attracting nurses to specialty areas. (3, 4) Within this context *recommendation 14* identified the need for consistency and quality in the development and delivery of transition programs. (3) The establishment of transitional support for nurses has been supported by all Australian Health Ministers. (3)

RNs in the intensive care setting require specialised knowledge and skills to safely and effectively care for critically ill patients. Individual intensive care services have developed orientation and/or transition programs to facilitate and support RNs to develop their practice to meet the standard of safe and effective care. (5, 6, 7) These programs are targeted at the transitional needs of new employees with little or no intensive care experience, new employees with intensive care experience but without formal qualifications, experienced nurses wishing to make a transition to intensive care nursing, nurses returning to intensive care and individual professional development.

Whilst these programs may provide for the needs of individual intensive care services, there is currently no formal mechanism for sharing information, resources and experience across NSW in relation to transition programs. Considerable variability in content and outcome objectives exists across programs and a lack of equity in access to programs for all nurses working in or wishing to work in intensive care has been identified. (8) In order to develop unit programs in isolation, individual nurse educators have needed to “reinvent the wheel”, without the guidance of established standards, a curriculum framework or access to shared educational resources.

The vision, goals and strategic directions of NSW Health as articulated in A New Direction for NSW: State Health Plan Towards 2010 (February 2007) acknowledges that “The health workforce needed for 2010 will be increased, trained, organised and deployed creatively and intelligently to focus on the changing needs of health consumers, carers and the wider population”.(9) It is envisioned, by the Steering Group, that a transition to intensive care program will contribute significantly to achieving the goals of providing an appropriately skilled nursing workforce able to deliver quality intensive care health services. The state-wide transition to intensive care nursing model, that is proposed, will enable improved efficiencies in providing educational support and offer greater flexibility for nurses seeking a career path in the care of the critically ill.

Terms of Reference of the Steering Group

Appropriately qualified nurses from all key stakeholder groups will cooperatively develop a program for nurses undertaking a transition to ICU nursing. This program is to be hospital based, clinically focussed and recognised as an introduction / orientation to this nursing specialty.

- A generic program of core components is to be developed as the baseline educational undertaking for all nurses commencing work in ICU
- A minimum data set will be developed to form the framework for a standardised transition ton ICU Program to be used in and recognised by all rural and metropolitan ICUs.
- The program will be incorporated into an introduction / orientation program to all ICUs and may be built on by further programs.
- This transition program will be structured around a set of agreed elements, core skills and competencies for ICU nursing practice.

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- The program will sit within each facility's educational inservice program and may form part of a nurse's portfolio.
- The program will be endorsed by the Steering Group, which has representatives from critical care nurses and service managers in NSW, ACCCN, other critical care course providers and education groups.

Key Dates and Schedule of Meetings

- April 2004. Presentation of discussion document to CNO on need for transition to intensive care to be developed in NSW.
- October 2004. Workshop to discuss need for transition program.
- Feb 2005. Meeting to follow-up workshop – Terms of Reference for Transition to ICU Project Drafted (attached) and Steering Committee of key stakeholders convened.
- June 2005. Working Party established to identify or establish:
 - The level of clinical competence / practice that is required to form the outcome standard of the transition program.
 - Educational objectives that will underpin this level of clinical practice and define the scope of the program.
 - Individual clinical competencies to be achieved to provide the level of care defined by the outcome standard.
- June – Oct 2005. Development of Draft Transition Goals, Education Objectives and Clinical Competencies document and Education Resources Survey document.
- Oct 2005 – Feb 2006. All NUMs of all levels 4, 5 & 6 ICUs were surveyed and the results of survey collated and reviewed.
- June 2006. Final Transition to Intensive Care Nursing Working Party report submitted to CNO.
- October 2006. Project discussed with CNO and at ADONMs meeting.
- February 2007. Package prepared for ADONMs meeting 15/2 with covering request for the ADONMs to consider the work and the recommendations.
- April - July 2007. 4 responses to the report were received.
- August 2007. Responses provided to Working Party for their consideration.
- September 2007. Working Party teleconference to discuss next steps.
- October 2007. Steering Group meets to discuss Working Part report and determine recommendations for presentation to CNO.

Steering Group Membership

Prof Sharon McKinley RN, Professor of Critical Care Nursing, University of Technology Sydney.

Julienne Onley FCN| Director Education Services, The College of Nursing.

Prof Patrick Crookes, (at time of participation), Professor, Head, Department of Nursing. University of Wollongong.

Karen Patterson RN RM, Area Nurse Manager, Clinical Leadership, Practice Development & Education, SESIAHS.

Angela Brown, Associate Head of School / Senior Lecturer, University of Wollongong.

Roy Brown, Lecturer / Bachelor of Nursing Programme Coordinator, University of Wollongong.

Mary MacNamara RN, CNC – Intensive Care, North Coast AHS.

Vicki Conyers RN, CNC – Critical Care, Greater Western AHS.

Rand Butcher RN, CNC – ICU/CCU, North Coast AHS.

Tina Kendrick RN, CNS, PICU, Children's Hospital Westmead.

Martin Boyle RN, CNC – Intensive Care, Prince of Wales Hospital. (Chair)

Janet Masters RN, CNE, Mt Druitt Hospital.

Richard Conway RN, NE – Intensive Care, Westmead Hospital.

Emma Mansfield RN, NE – Intensive Care, The Wollongong Hospital.

Donna Pennell RN, NE – Critical Care, The College of Nursing.

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Prof Doug Elliott, (at time of participation), Professor of Nursing, Critical Care, Prince of Wales Hospital and the Department of Clinical Nursing, The University of Sydney).

Working Party Membership

Mary MacNamara RN, CNC – Intensive Care, North Coast AHS.
Vicki Conyers RN, CNC – Critical Care, Greater Western AHS.
Rand Butcher RN, CNC – ICU/CCU, North Coast AHS.
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Richard Conway RN, NE – Intensive Care, Westmead Hospital.
Emma Mansfield RN, NE – Intensive Care, The Wollongong Hospital.
Donna Pennell RN, NE – Critical Care, The College of Nursing.

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Transition to Intensive Care Nursing; Definitions, Goals, Learning Objectives and Clinical Competencies.

DEFINITIONS

Intensive Care Unit

“An Intensive Care Unit is a specially staffed, and equipped, separate and self contained section of the hospital for the management of patients with life threatening or potentially life threatening conditions.

An Intensive Care Unit provides special expertise and facilities for the support of vital functions, and utilises the skills of medical, nursing and other staff with expertise in the management of these problems” (1)

In NSW, clinical units are classified according to their service role.(2, 3) Units providing a service role of 4,5 or 6 are considered intensive care services able to provide a diverse range of therapies, whilst level 3 or below are considered high dependency units (refer to Appendix 1 for a description of the levels).(2, 3) Role delineation levels 4, 5 and 6 correspond to levels 1, 2 and 3 respectively, of the Joint Faculty of Intensive Care Medicine (JFICM) definitions. (4)

Transition Program

Formal program of education and clinical support designed to facilitate the transition to intensive care nursing.

Transition

“the period of learning, adjustment and socialisation, when the nurse applies, consolidates and increases their existing knowledge, gaining competence (knowledge, skill, and attitude) that is applicable to the nursing practice of the clinical setting or patient population in which they are expected to perform” (5)

Outcome standard

A registered nurse able to provide safe and effective care for a critically ill patient in ICU and characterised by the range of attributes “supervised” to “independent” (see Appendix 2 for details)

Critically ill patient

A patient with an actual or potentially life threatening condition requiring intervention to support organ function eg, mechanical ventilation support, haemodynamic monitoring/support, renal replacement therapy.

Competence

Competence is considered to have three components, educational outcomes (or knowledge) psychomotor skills and attitude/behaviours.

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INTENSIVE CARE TRANSITION TARGET GROUP

- New employees with little or no intensive care experience
- New employees with intensive care experience but without formal qualifications
- Experienced nurses wishing to make a transition to intensive care nursing
- Nurses returning to intensive care
- Individual nurse professional development

The program is targeted at the needs of a registered nurse in a process of transition to intensive care nursing and working in a level 5 or 6 intensive care unit (2, 3). (equivalent to level 2 or 3 of JFICM Guidelines (1, 4)) ie. a unit that can at least provide mechanical ventilation, extra-corporeal renal support and invasive cardiovascular monitoring for a period of several days.

It is recognised that, in the rural context, level 4 designated intensive care units operate at a different level to their metropolitan counterparts. Many rural intensive care units provide care consistent with level 5 role delineation.

It is envisaged that nurses working in level 4 intensive care units (2, 3) (equivalent to level 1 of JFICM Guidelines (1, 4)) ie. a unit able to provide mechanical ventilation and simple invasive cardiovascular monitoring for several hours, will be able to identify elements of the program to meet their needs.

INTENSIVE CARE TRANSITION PROGRAM GOAL

At the end of the transition program the participant should be able to demonstrate core competencies that are essential for the delivery of safe and effective care to patients in the intensive care unit.

Competency development is a dynamic process involving learning and experience, which occurs over time. It is envisaged that the registered nurse undertaking the transition program will, by the end of the program, exhibit nursing practice that can be characterised as “supervised to independent” (see *Appendix 2; Modified Bondy Scale* for a full description of practice attributes).

Caveats

The nurse at this level will generally:

- Not possess the experience and expertise necessary for the matching of clinical practice and complex patient needs;
- Not possess the experience and expertise necessary for the development of long term goals of patient management and the development of sophisticated expectations of the outcomes achievable from nursing and medical care;
- Require expert support and supervision for complex clinical assessment and management.

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TRANSITION PROGRAM CORE COMPETENCY STATEMENTS

At the completion of the transition program the participant will be able to;

A.	Maintain an environment that contributes to the delivery of safe and effective care.
B.	Assess, plan, implement and evaluate interventions that are required because of the patients altered dependency state including response to stress; eye, mouth, pressure area care, positioning, bowel care; and temperature regulation.
C	Assess the adequacy of a patient's ventilation and oxygenation and provide safe and effective care to patients receiving ventilatory and/or oxygenation support.
D	Assess the adequacy of a patient's cardiovascular function and provide safe and effective care to patients requiring haemodynamic monitoring and cardiovascular support.
E	Assess the patient's fluid and electrolyte status and provide safe and effective care to patients requiring fluid and electrolyte management.
F	Assess the patient's gross neurological function and provide safe and effective care of patients with neurological dysfunction.
G.	Assess and plan safe and effective care for the critically ill patient suffering from gastrointestinal or metabolic dysfunction.
H.	Identify the consequences of critical illness

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Competency A

Safety

The participant will be able to demonstrate achievement of the following competency:

Maintain an environment that contributes to the delivery of safe and effective care.

The objectives that support achievement of this competency are:

- A1. Access resource material, protocols and the unit's specific practice standards and guidelines.
- A2. Apply principles of safe practice regarding medical imaging.
- A3. Apply the principles safe practice in relation to electrical safety ensuring provision of a safe environment for self and others.
- A4. Describe the nurse's role in the event of power, air and oxygen failure.
- A5. Describe the nurse's role in the event of an urgent unit evacuation.
- A6. Discuss and demonstrate the principles of infection control (airborne, droplet and contact precautions) utilised in the management of critically ill patients.
- A7. Identify the special requirements for undertaking patient transport as required by the unit's specific policies and procedures:
 - interhospital transfer
 - intrahospital transport (OT, CT etc)
- A8. Incorporate the principles of safe manual handling in delivering patient care.

To complete this competency the participant will have met the objectives and demonstrated the following psychomotor skills:

- A9. Demonstrate checking of equipment and surrounding environment at the change of shift / prior to patient admission as per unit policy.
- A10. Complete Basic Life Support (BLS) assessment.
- A11. Demonstrate the correct use of manual handling devices eg mechanical lifters, turning sheets, specialised beds.
- A12. Demonstrate the ability to safely perform patient transport.
- A13. Perform a basic physical assessment.
- A14. Demonstrate the preparation of a bed area for a patient admitted to ICU.

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Competency B

**Consequences of critical illness
Patient dependency, Needs of significant others**

The participant will be able to demonstrate achievement of the following competency:

Assess, plan, implement and evaluate interventions that are required because of the patients altered dependency state and the impact of critical illness on the patient and their significant others.

To provide care to critically ill patients the participant must be familiar with the anatomy and physiology underlying the body's response to stress. The following outline of knowledge that underpins this competency is a guide for review and recognition of prior learning:

- The physiological response to stress in the critically ill patient including:
 - General adaptive syndrome
 - Metabolic effects – blood sugar control
 - Hypothalamic – pituitary – adrenal axis, effects of cortisol
- Thermoregulation

Program Objectives

The objectives that support achievement of this competency are:

B1. Outline causes of stress for the patient in the critical care environment including:

- Pain
- Sleep deprivation
- Noise
- Isolation/separation
- Communication deficits
- Immobilisation
- Technology

B2. Discuss the effects of critical illness in terms of an altered dependency state and the specific need for eye care, mouth care, pressure area care, positioning and bowel care, DVT prophylaxis.

B3. Identify strategies and interventions that can minimise the impact of critical illness in respect of eye care, mouth care, pressure area care, positioning, and bowel care – including:

- Normal eye protection mechanisms – eyelid closure, function of tears.
- Effects of critical illness – failure of eyelid closure, conjunctival oedema, ulceration and infection.
- Rationale for eye care – ensuring eyelid closure, maintaining conjunctival health, preventing infection.
- Oral hygiene – normal function of chewing and saliva – effects of critical illness (intubation) on oral flora – link to ventilator associated pneumonia (VAP) – importance of oral hygiene measures (incl. gums and teeth) in decreasing incidence of VAP – importance of above cuff suctioning (if intubated).
- Pressure area risk factors – strategies to reduce risk.

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- Role of positioning – in relation to VAP, atelectasis, and pulmonary ventilation and perfusion.
- Effect of critical illness on gastrointestinal function – strategies to deal with constipation, diarrhoea.

B4. Identify the effects of critical illness on thermoregulation

B5. Identify the specific need of critically ill patients with regards to temperature regulation

Including:

- Effect of body temperature on metabolic rate (oxygen demand, carbon dioxide production)
- Metabolic cost of shivering
- Differentiation between fever and hyperthermia resulting from loss of thermoregulation
- Significance of body temperature in specific pathological states – head injury, post cardiac arrest.

B6. Discuss the causes of stress for the patient, for family members / significant others who have relatives in your unit – address role of social worker.

B7. Discuss ways in which staff can help to reduce the impact of stress in family members / significant others.

B8. Identify and discuss the impact of the care of the critically ill on staff stress and risk of burnout.

B9. Identify methods and practices that may be used to manage stress and reduce the risk of burnout.

To complete this competency the participant will have met the objectives and demonstrated the following psychomotor skills:

B11. Conduct an assessment of a patient and family identifying the impact of critical illness and devise appropriate strategies to reduce stress associated with this experience.

B12. Describe and demonstrate the assessment and management of acute and chronic pain for the critically ill – eg. assessment and management of epidural blockade, PCA, continuous narcotic infusions.

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Competency C

**Respiratory:
Airway oxygenation and mechanical ventilation**

The participant will be able to demonstrate achievement of the following competency:

Assess the adequacy of a patient's ventilation and oxygenation and provide safe and effective care to patients receiving ventilatory and/or oxygenation support.

To provide care to critically ill patients the participant must be familiar with the anatomy and physiology of the respiratory system. The following outline of knowledge that underpins this competency is a guide for review and recognition of prior learning:

- Functions of the respiratory system
- Anatomy of the upper and lower respiratory tract
- Control of ventilation
 - central mechanisms
 - peripheral mechanisms
- Respiratory physiology including:
 - pleural pressures
 - inspiration & expiration
 - the work of breathing, the oxygen cost of breathing
 - static pressure - volume relationship, FRC, closing capacity and deadspace
- Concept of lung compliance and resistance
- Methods of measuring compliance and resistance
- Partial pressures of gas in dry air and the change in gas composition within the respiratory tract
- Role of nitrogen in maintaining alveolar volume
- Physiology of ventilation and perfusion
- Mechanisms responsible for hypoxaemia
- Oxygen and carbon dioxide transport

Program Objectives

The objectives that support achievement of this competency are:

Support of Oxygenation and Ventilation

C1. Identify and discuss the key aspects of respiratory physical assessment for ventilated and non ventilated patients – address work of breathing, use of accessory muscles, dyspnoea scales.

C2. Define the following and describe the factors influencing:

- oxygenation
- ventilation
- internal respiration
- external respiration

C3. Outline the meaning of the following and state their capacities:

- tidal volume

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- minute volume
- functional residual capacity
- total lung capacity.

C4. Define airway resistance and pulmonary compliance.

C5. Describe conditions that are characterised by an:

- increase in airway resistance
- decrease in pulmonary compliance

C6. Define atelectasis and identify patients who are at risk of developing this condition.

C7. Discuss ways in which atelectasis can be minimised in the clinical setting.

C8. Outline methods used to administer oxygen therapy.

C9. Discuss humidification for a patient receiving supplemental oxygen.

C10. Outline the difference between spontaneous breathing and positive pressure ventilation.

C11. Identify the principles of mechanical ventilation.

C12. Identify the indications for mechanical ventilation.

C13. Discuss ventilation and perfusion relationships.

C14. Describe the effect that positioning may have on ventilation and perfusion and relate this to the clinical setting.

C15. Identify the signs and possible causes of ventilator failure and its management.

C16. Describe and contrast modes and components of mechanical ventilation available in the participant's unit.

C17. Describe the role of sedating, analgesic and paralysing agents in the management of a patient who is mechanically ventilated – identify the potential impact of sedation practice on weaning from ventilation and the role of targeted sedation, sedation scales and periodic breaks from sedation (ie “sedation holiday”)

C18. Outline the clinical effects of the following drug groups that are relevant to their administration:

- narcotics
- sedatives
- hypnotics
- local anaesthetics

C19. Outline the clinical effects of the following drugs that are relevant to their administration:

- depolarising muscle relaxants
- non-depolarising muscle relaxants

C20. Describe and differentiate between the non-invasive modes of positive pressure ventilation - Continuous Positive Airway Pressure (CPAP) and Bilevel Positive Airway Pressure (BiPAP).

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C21. Describe methods and indications and contraindications for non-invasive positive pressure ventilation.

C22. Describe the physiological effects of positive pressure ventilation on a patient under the following headings in relation to:

- central nervous system
- respiratory system
- cardiovascular system
- renal system
- gastrointestinal system

C23. Discuss complications of positive pressure ventilation.

C24. Discuss the complications of oxygen therapy.

C25. Identify and describe alternative ventilation strategies for varying clinical conditions.

C26. Identify and discuss the clinical parameters used to assess a patient before and during the ventilation weaning process.

C27. Identify methods of weaning from positive pressure ventilation.

Monitoring Oxygenation and Ventilation

C28. Describe and demonstrate the use of pulse oximetry including:

- indications
- principles
- waveforms
- potential sources of inaccuracy

C29. Identify normal range values for the components of an arterial blood gas.

C30. Describe the various types of acid base disturbance in relation to arterial blood gases.

C31. Identify the clinical signs that may indicate that a patient is experiencing increased work of breathing and discuss its collaborative management.

C32. Describe and demonstrate the use of End Tidal Carbon Dioxide (ETCO₂) monitoring including:

- indications
- principles
- waveforms
- trouble shooting
- interpretation

Airway management, endotracheal and tracheostomy tubes

C33. Identify the indications for endotracheal intubation.

C34. Discuss the indications and relative contraindications of the following classes of drugs which may be used during intubation:

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- sedative/hypnotic
- narcotic
- paralysing agents

C35. Discuss and demonstrate the process for endotracheal intubation and the role of the registered nurse.

C36. Discuss the possible complications of endotracheal intubation and their collaborative management.

C37. Discuss and demonstrate additional management of a patient who has an endotracheal / tracheostomy tube in situ including:

- maintenance of skin integrity / hygiene needs
- maintenance of nutritional status

C38. Describe the causes, preventative measures and collaborative management of complications associated with endotracheal / tracheostomy tubes including:

- tube malposition
- accidental extubation / decannulation
- blocked tubes

C39. Discuss the indications for and complications associated with surgical and percutaneous tracheostomy.

C40. Discuss the assessment criteria that would indicate a patient is ready for extubation.

C41. Identify the patient presentation in failed extubation and discuss the collaborative management.

Underwater sealed chest drains

C42. Discuss the indications for the use of intercostal catheters (ICC) under water seal drains (UWSD).

C43. Discuss the principles and components of UWSD.

C44. Identify the potential complications associated with UWSD and discuss the collaborative interventions.

C45. Discuss the assessment and management of a patient with UWSD.

C46. Identify the assessment data that would indicate UWSD are ready to be removed.

To complete this competency the participant will have met the objectives and demonstrated the following psychomotor skills:

C47. Perform a health assessment of a patient's respiratory system and document findings.

C48. Demonstrate a systematic process for interpretation of chest x-rays identifying:

- tube/line placement
- pneumothorax/haemothorax
- loss of lung volume

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C49. Describe and demonstrate the methods for maintaining a patent airway.

C50. Demonstrate the safe insertion of nasopharyngeal and oropharyngeal airways.

C51. Discuss and demonstrate the importance of tube security and methods used to secure endotracheal/tracheostomy tubes.

C51. Discuss and demonstrate basic care of a patient with an endotracheal/tracheostomy tube in situ including;

- checking and maintaining the cuff
- suctioning procedure
- mouth care
- communication techniques
- infection control

C52. Demonstrate manual ventilation of an intubated and non-intubated patient.

C53. Identify the indications and demonstrate the correct procedure for obtaining a blood gas from an arterial line.

C54. Perform an arterial blood gas analysis on a blood gas machine (in units that have access to same).

C55. Perform pre-use safety check of ventilators within the participant's unit.

C56. Demonstrate assembly of ventilator circuits and manual ventilation circuits appropriate to the participant's unit.

C57. Discuss the factors that may cause ventilator alarms to be activated and demonstrate appropriate trouble shooting.

C58. Demonstrate the ability to set appropriate ventilator alarm parameters.

C59. Adjust ventilator alarm settings as indicated by the physical assessment data with the guidance of unit protocols.

C60. Demonstrate the assessment, observation, management and documentation of a patient receiving analgesia and sedation.

C61. Discuss and demonstrate the management of a patient who is receiving noninvasive positive pressure ventilation – including; settings, patient interface, humidification.

C62. Discuss and demonstrate extubation / decannulation of a patient including;

- patient preparation
- post extubation evaluation
- documentation

C63. Demonstrate the procedure for changing UWSD collection device for a ventilated and non-ventilated patient.

C64. Discuss and demonstrate the removal of ICC for a ventilated and nonventilated patient in accordance with your unit's policy.

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C65. Assist with the intubation of a patient.

C66. Discuss and demonstrate methods to deliver inhaled medications to a ventilated patient as per unit practice.

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Competency D

**Cardiac
Haemodynamic monitoring and cardiac electrophysiology**

The participant will be able to demonstrate achievement of the following competency:

Assess the adequacy of a patient's cardiovascular function and provide safe and effective care to patients requiring haemodynamic monitoring and cardiovascular support.

To provide care to critically ill patients the participant must be familiar with the anatomy and physiology of the cardiovascular system and the basic principles of electrophysiology. The following outline of knowledge that underpins this competency is a guide for review and recognition of prior learning.

Electrophysiology

- The dimensions of the grid used with standard ECG paper
- The normal conducting system and electrical activity of the heart:
 - transmembrane potential and action potential
 - conduction in cardiac fibres
 - cardiac excitability
- The principles of electrocardiography:
 - Einthoven's Triangle
 - lead system (standard limb leads, augmented leads, precordial leads)
 - monitoring leads
- P wave abnormalities:
 - conduction abnormality
 - retrograde conduction
- Abnormalities in the PR interval:
 - prolonged PR interval
 - shortened PR interval
- Abnormalities in the QRS morphology:
 - widened QRS morphologies
 - QRS segment changes
 - Q-T intervals

Cardiovascular physiology

- Structure of the heart
- Cardiac cycle and coronary artery circulation
- Cardiac conduction and action potential
- Neurohormonal and reflex control of the heart
- The concepts of oxygen supply and demand
- The determinants of blood flow and its regulation.
- Pathophysiology of the different types of shock including:
 - Cardiogenic
 - Septic
 - Hypovolaemic
 - Neurogenic
 - Anaphylactic

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Haemodynamic Monitoring

- Arterial and venous pressure and the factors that result in the variation in arterial and venous pressures throughout the vascular tree
- The generation of the arterial pressure wave
- The methods used to measure intravascular pressure
- The methods for ensuring the clinical accuracy of a transducer monitoring system eg:
 - system components
 - assessing dynamic response
 - checking against alternate measure - cuff pressure
 - static calibration using a sphygmomanometer
 - zeroing (balancing) transducer to atmospheric pressure
 - levelling transducer to reference point (phlebostatic axis)

Program Objectives

The objectives that support achievement of this competency are:

ECG Rhythm Identification

D1. Demonstrate a systematic analysis of an ECG rhythm strip identifying:

- P wave
- P-R interval
- QRS complex
- T wave
- QT interval
- S-T segment/T wave associated with ischaemia / injury/ infarction

D2. Identify the normal components of the ECG and relate them to the cardiac excitation and contraction, eg:

- Isoelectric line
- P wave size and duration
- Normal PR interval
- QRS complex size and duration
- ST segment
- QT interval

D3. Determine, from an ECG rhythm strip, the heart rate and rhythm recognising:

- Sinus Rhythm
- Sinus Bradycardia
- Sinus tachycardia
- Heart blocks, 1,2,3
- Idioventricular rhythm
- Supraventricular tachycardia
- Junctional rhythm
- Ventricular fibrillation
- Ventricular tachycardia
- Atrial fibrillation
- Atrial flutter
- Asystole
- Paced rhythm
- Ectopy
 - VEBs

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- AEBs
- JEBs

D4. Identify and explain indication(s) for a 12 lead ECG.

D5. Identify common problems associated with the recording of an ECG and provide strategies to limit/overcome their effect.

D6. Describe the 12 lead ECG changes that indicate possible ischaemia, injury or infarction.

D7. Identify the relevance of biochemical markers in the diagnosis of myocardial injury – CKMB, troponin.

Cardiovascular Physiology

D8. Describe the factors that determine cardiac output:

- stroke volume
- heart rate

D9. Define what is meant by preload, afterload and contractility and integrate these concepts into patient assessment.

D10. Discuss the manipulation of cardiac output including;

- drug therapy
- fluid therapy

D11. Identify the factors that determine oxygen delivery and consumption and the factors that determine central and peripheral distribution of blood and oxygen, ie:

- metabolic rate
- cardiac output
- SaO₂
- Hb
- dissolved O₂

Haemodynamic Monitoring

D12. Identify intravascular catheter care practice that minimises the incidence of catheter related sepsis.

D13. Identify the advantages, risks and/or complications of invasive arterial pressure monitoring.

D14. Identify the observations that are required for safe care of a patient with an arterial line insitu.

D15. Describe the procedure for confirming the correct placement of a CV line:

- x-ray landmarks
- waveform
- aspirate lumens for blood

D16. Describe the methods that may be used to measure cardiac output at the bedside, for example:

- echo
- thermodilution
- pulse contour analysis

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Cardiovascular Drug Management

D17. Identify and discuss the indications, actions, and nursing responsibilities for;

- Inotropic and vasoactive drugs
- Volume loading
- Antiarrhythmic drugs
- Thrombolytic agents

D18. Describe the actions, indications and precautions of first line cardiac arrest drugs (adrenaline, amiodarone, atropine).

Temporary Cardiac Pacing

D19. Discuss indications for temporary cardiac pacing.

D20. Identify the function of the pace maker controls, ie rate, output, sensitivity.

D21. Describe the process for testing the threshold and sensitivity limits for a temporary cardiac pacemaker.

To complete this competency the participant will have met the objectives and demonstrated the following psychomotor skills:

D22. Perform and document a health assessment of the patient's cardiovascular system.

D23. Initiate and maintain ECG monitoring.

D24. Correct lead placement for the monitoring system(s)

D25. Recording a 12 lead ECG.

D26. The setting of appropriate alarm limits on the bedside monitor for heart rate, blood pressure, respiratory rate, etc.

D27. The technique for (with a fluid filled monitoring system):

- assembling a pressure monitoring system
- zeroing and calibrating a fluid monitoring system
- assessing the accuracy of a fluid filled monitoring system
- haemodynamic waveforms

D28. Assisting with insertion of intravascular lines eg, arterial line, central venous line.

D29. Stabilisation and dressing of intravascular lines, eg arterial and CV lines. – according to unit policy/practice.

D30. Removal of an arterial line.

D31. Removal of a central line.

D32. Set-up and operation of the infusion pumps and syringe drivers used in the ICU.

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D33. Compliance with unit guidelines/policies for the preparation, administration and documentation of drugs/drug infusions used in the participant's unit.

D34. Rationalise the choice of lumens / venous access for vasoactive drugs.

D35. Safe technique for changing the concentration of a vasoactive drug infusion.

D36. Compliance with unit practice for inotrope/vasoactive infusion line change.

D37. Identify the rhythm disturbances that are associated with a cardiac arrest and demonstrate correct selection and administration of first line cardiac arrest drugs as well as the procedure for defibrillation.

D38. Identify and describe the significance of:

- failure to capture
- failure to sense
- failure to pace

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Competency E

Fluid, electrolyte and renal support

The participant will be able to demonstrate achievement of the following competency:

Assess the patient's fluid and electrolyte status and provide safe and effective care to patients requiring fluid and electrolyte management and renal support.

To provide care to critically ill patients the participant must be familiar with physiology of fluids and electrolytes as well as the anatomy and physiology of the kidneys. The following outline of knowledge that underpins this competency is a guide for review and recognition of prior learning.

Fluids and electrolytes.

- Physiology of water and electrolyte partitioning:
 - mechanisms of cellular exchange
 - the sodium potassium pump
- Distribution of body fluids
- Definition of osmolality and tonicity
- Daily water requirements
- Development of oedema
- Response to stress in terms of sodium, potassium and water balance
- Composition and tonicity of commonly used intravenous fluids and the relative distribution of water within the body fluid compartments as a result of the infusion of intravenous fluids

Renal

- Relevant aspects of renal physiology:
 - renal blood flow
 - glomerular filtration
 - tubular function
 - renal autoregulation
- Definition and pathophysiology of acute renal failure
- Systemic manifestations of renal failure
- Indications for renal replacement therapy

Program Objectives

The objectives that support achievement of this competency are:

Fluids and Electrolytes.

E1. Outline the differences between crystalloid and colloid fluids and how they would be used in differing clinical circumstances;

- Dehydration
- Inadequate intravascular volume

E2. Describe the main functions, normal plasma concentrations and factors that could lead to an excess or depletion for each of the following electrolytes:

- potassium
- magnesium

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- calcium
- sodium
- phosphate

E3. Outline the cause of diuresis seen in:

- Diabetes insipidus
- Hyperglycaemia

E4. Identify ECG changes characteristic of hyper/hypo-kalaemia and provide a rationale for the treatments that may be used to treat hyperkalaemia including:

- calcium administration
- glucose/insulin infusion
- sodium bicarbonate administration
- cation exchange resin (eg. resonium A)
- dialysis

E5. Describe the mechanisms underlying hypokalaemia as a result of:

- frusemide administration
- overventilation

E6. Provide a rationale for the administration of magnesium in the setting of, for example:

- acute MI
- ventricular ectopics
- post - op CABG

Renal – Renal Replacement Therapy

E7. Distinguish between the different types of renal failure and identify the consequences of renal failure in terms of; acid/base balance, water balance, electrolyte balance (especially potassium), solute excretion (eg metabolic end products, drugs)

E8. Demonstrate knowledge of the indicators of renal function:

- serum urea
- creatine
- urine output

E9. Describe the use of renal replacement therapy in:

- fluid overload
- metabolic acidosis
- hyperkalaemia
- selected drug overdose

E10. Discuss the effects of renal failure on drug excretion and the drug dosing adjustments that may be required.

E11. Identify and explain the basic principles of renal replacement therapy:

- convection
- diffusion
- ultrafiltration
- osmosis / reverse osmosis

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E12. Demonstrate knowledge of the range of methods available for renal replacement therapy, their relative benefits and deficiencies, and provide a rationale for the choice of method(s) utilised in the participant's unit.

E13. Discuss the management of renal replacement therapy addressing;

- dialysis or substitution rate
- blood pump rate
- anticoagulation
- vascular access
- pre-post dilution

E14. Discuss the principles of nutritional support for patients with; acute renal failure, chronic renal failure – and identify the consequences of renal replacement therapy in terms of nutrient and vitamin loss.

E15. Demonstrate knowledge of the intravenous fluids used in the participant's unit and provide a rationale for their use.

To complete this competency the participant will have met the objectives and demonstrated the following psychomotor skills:

E16. Perform and document a health assessment of the patient's renal function and fluid status.

E17. Maintenance and documentation of fluid balance in conjunction with management of renal replacement therapy.

E18. Care of vascular access devices and maintenance of vascular access used for renal replacement therapy.

E19. Set up the renal replacement therapy used in the participant's place of work.

E20. Demonstrate procedures for connecting and disconnecting a patient from renal replacement therapy.

E21. Demonstrate appropriate alarm setting and trouble shooting basic alarms.

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Competency F

Neuroscience

The participant will be able to demonstrate achievement of the following competency:

Assess the patient's gross neurological function and provide safe and effective care of patients with neurological dysfunction.

To provide care to critically ill patients the participant must be familiar with the anatomy and physiology of the nervous system. The following outline of knowledge that underpins this competency is a guide for review and recognition of prior learning.

Neurotrauma & Neurosurgery

- Names, distribution, and function of the cranial nerves.
- Volume pressure relationship of the intracerebral contents in association with:
 - compensatory mechanisms
 - elastance and compliance
 - CSF secretion and absorption
 - cerebral blood flow
 - cerebral autoregulation – relationship between intracranial pressure, cerebral perfusion pressure and mean arterial pressure
 - cerebral metabolic activity
 - cerebral perfusion pressure
- Concepts of primary and secondary injury
- Pathophysiology of cerebral oedema
- Methods used to monitor and record the ICP and pressure wave.
- Definition and grading of subarachnoid haemorrhage
- Pathophysiology of cerebral vasospasm
- Therapies used to treat cerebral vasospasm including:
 - induced hypertension
 - hypervolaemic haemodilution
 - calcium channel blockers
- Types of brain herniation syndromes, their cause and sequelae
- Definition, diagnostic confirmation of brain death and the criteria for organ donation

Acute Spinal Cord Injury

- The anatomy of the major structures comprising the spinal column and spinal cord
- The relationship between the level of spinal cord lesions and the extent of compromise caused to:
 - the autonomic nervous system
 - respiratory function
 - movement and sensation
 - bowel and bladder functions

Program Objectives

The objectives that support achievement of this competency are:

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F1. Identify the relevant gross anatomy of the skull, cerebral vascular system and the CSF circulation system.

F2. Identify the sections of a volume - pressure curve that correspond to:

- effective compensation
- decompensation

F3. List the normal range for ICP and CPP.

F4. Provide a rationale for each of the following nursing measures in managing a patient with increased intracranial pressure:

- head position
- adequate ventilation
- avoiding hyperthermia
- avoiding hypoxaemia
- maintaining MAP & CPP
- avoiding coughing and straining
- avoiding "stacking" nursing activities

F5. Provide a rationale for the use of the following in the care of a patient with raised ICP:

- mannitol/hypertonic saline
- frusemide
- muscle paralysis
- barbiturate infusion
- sedation
- CSF drainage

F6. Identify the reference point for levelling ICP & arterial transducers and ventricular drainage bags.

F7. Describe the procedure for the correct care of a ventricular drainage system:

- levelling
- infection control
- draining CSF
- sampling CSF

F8. Describe the function, significance, and nursing care associated with:

- SjO₂ monitoring
- Continuous EEG monitoring
- Cerebral angiography and Transcranial doppler scans (in units where these are used)

F9. Demonstrate an understanding of the signs that are associated with impending brain herniation.

F10. Describe the tests undertaken to establish brain death - Identify the legal time of death for a patient undergoing brain death testing.

F11. Identify the ethical and legal issues pertinent to the definition of brain death.

F12. Describe the process of organising organ donation if applicable.

F13. Identify the major mechanism of spinal cord injury

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F14. Identify the major consequences of injury to the spinal cord at different levels; cervical, thoracic, lumbar – and identify the motor function deficits associated with the different levels of injury.

F13. Identify the clinical features and treatment of:

- spinal and neurogenic shock
- poikilothermal
- autonomic dysreflexia
- orthostatic hypotension

F14. Describe the features of - and - identify the potential consequences of seizure activity.

F15. Describe the principles of management for a patient experiencing seizure activity.

Psychomotor Skills

To complete this competency the participant will have met the objectives and demonstrated the following psychomotor skills:

F14. The assessment of neurological function using the Glasgow Coma Scale (GCS).

F15. ICP monitoring:

- Assembling an ICP pressure monitoring system.
- Zero and calibrate an ICP monitoring system
- Assess the accuracy of an ICP monitor

F16. Correct documentation of ICP from an intracranial monitoring system.

F17. Leveling of a ventricular drainage bag.

F18. The procedure for changing the ventricular drainage setup including drainage bag CSF specimen collection from CSF drainage system (in units where this is commonly done)

F19. Correct turning techniques in order to maintain spinal alignment and prevent skin breakdown:

- cervical spine immobilisation (head hold)
- log rolling
- Lifting frame

F20. Appropriate neurological assessment and documentation of a patient with spinal cord injury.

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Competency G

Gastrointestinal and metabolic dysfunction

The participant will be able to demonstrate achievement of the following competency:

Assess and plan safe and effective care for the critically ill patient suffering from gastrointestinal or metabolic dysfunction.

To provide care to critically ill patients the participant must be familiar with the anatomy and physiology of the gastrointestinal and metabolic systems. The following outline of knowledge that underpins this competency is a guide for review and recognition of prior learning.

Prerequisite knowledge.

- Anatomy and physiology of the gastrointestinal system including;
 - anatomy of the upper and lower GI tract
 - hepatic function
 - metabolic pathways and their control
- Anatomy and physiology of the hypothalamic – pituitary – adrenal axis
- Major functions of the following glands;
 - Pituitary
 - Thyroid
 - Parathyroid
 - Pancreas

Program Objectives

The objectives that support achievement of this competency are;

G1. Describe the clinical interventions to manage the replacement of gastrointestinal loss.

G2. Discuss the indications for and management of enteral feeding including

- confirming placement of enteral tubes
- rationale for early enteral feeding
- clinical criteria which indicate enteral feeding tolerance
- factors which inhibit gut motility
- potential complications of enteral feeding

G3. Identify the different types of enteral feeding tubes available for use in the critically ill patient and consider the advantages and disadvantages of each.

G4. Discuss the effects of critical illness on nutritional requirements and identify the composition of commonly used enteral and parenteral preparations.

G5. Identify the rationale for the use of different enteral/parenteral feed preparations.

G6. Discuss the indications for and management of parenteral nutrition including

- potential complications
- infection control
- glucose monitoring

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- lipid administration

G7. Identify and describe the clinical presentation of patients with the following conditions:

- diabetic ketoacidosis
- hyperosmolar, hyperglycaemic syndrome
- hypoglycaemia

G8. Identify altered bowel function (diarrhoea, constipation) as common consequences of critical illness and discuss relevant management strategies.

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Competency H

Consequences of critical illness

**Acute confusional states, weakness syndromes, long term consequences of critical illness
– life after intensive care**

The participant will be able to demonstrate achievement of the following competency:

To provide care to critically ill patients and to provide a foundation for further development as an intensive care specialist the participant must be familiar with the potential consequences of critical illness. Delirium and weakness syndromes are consequences that have great impact on patient morbidity / mortality, nursing care needs, and predispose patients to having diminished health-related quality of life after ICU. The following outline of knowledge underpins the participants continuing development of their intensive care practice.

Program Objectives.

The objectives that support achievement of this competency are;

- F8. Describe the risk factors associated with the development of acute confusional states (delirium)
- F9. Describe the diagnostic criteria used to define delirium.
- F10. Outline the principles of treatment of a patient suffering from delirium.
- F11. Describe the causes and consequences of critical illness weakness syndromes.
- F12. Identify the potentially prolonged recovery period after critical illness – explore the role of rehabilitation
- F12. Identify the effect of critical illness on long term quality of life.
- F13. Discuss the ethical and legal issues of withholding and withdrawing medical therapy.
- F14. Discuss the issues raised by the NSW Health (2004) “Using Advanced Care Directives” document and the relevance to critical care.
- F15. Discuss the issues raised by the NSW Health (2004) “Guidelines for end-of-life care and decision making” document and the relevance to critical care.
- F16. Explore the impact of the death of a patient; on significant others, and on ICU staff.

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Appendix 1. Role Delineation of Health Services – Intensive Care Levels 4, 5 and 6 – Key Points (2, 3)

4	Able to provide mechanical ventilation and simple invasive cardiovascular monitoring for several hours. Separate and self-contained facilitycapable of providing basic, multisystem life support usually for less than 24 hours. Equivalent to JFICM Level I.
5	As for level 4 plus mechanical ventilation, extracorporeal renal support services and invasive cardiovascular monitoring for a period of several days. Separate and self-contained facilitycapable of providing complex multi-system life support. Majority of nursing staff have post-registration qualifications in intensive care or clinical specialty of the unit. 1:1 care of ventilated patient or equivalently critically ill. Capacity to provide greater than 1:1 care if required. At least two RNs in unit if there is a patient in the unit. Active medical and nursing education programs. Access to Clinical Nurse Educator. Equivalent to JFICM Level II.
6	As for level 5 plus mechanical ventilation, extracorporeal renal support and invasive cardiovascular monitoring for an indefinite period. Separate and self-contained unitcapable of providing complex multi-system life-support for an indefinite period. Referral centre for intensive care patients. Equivalent to JFICM Level III.

Appendix 2. Modified Bondy Scale (6)

	PERFORMANCE SKILLS	KNOWLEDGE	COMMUNICATION
INDEPENDENT	<ul style="list-style-type: none"> • Demonstrates safe clinical practice each time observed, while functioning within the hospital's guidelines for Policy & Procedures, Workplace Health & Safety and Infection Control. • Functions as an independent practitioner with no supportive or directive cues. • Demonstrates effective time management with no wasted energy. • Demonstrates a high level of proficient & coordinated clinical practice. 	<ul style="list-style-type: none"> • Consistently uses theoretical knowledge to validate clinical practice. • Demonstrates awareness of research to validate clinical practice. 	<ul style="list-style-type: none"> • Consistently communicates effectively by: <ul style="list-style-type: none"> -Focusing on the client -Using therapeutic touch -Awareness/use of alternate means of communication -Using listening skills when interacting with the patient and family -Clarifying information where necessary -Interacting effectively with all members of the health care team
SUPERVISED	<ul style="list-style-type: none"> • Demonstrates safe clinical practice each time observed, while functioning within the hospital's guidelines for Policy & Procedures, Workplace Health & Safety and Infection Control. • Functions as an independent practitioner with no directive but some supportive cues. • Demonstrates effective time management with little evidence of wasted energy. • Demonstrates a sound level of proficient & coordinated clinical practice. 	<ul style="list-style-type: none"> • Often uses theoretical knowledge to validate clinical practice. • Demonstrates some awareness of research to validate clinical practice. 	<ul style="list-style-type: none"> • Often communicates effectively by: <ul style="list-style-type: none"> -Focusing on the client -Using therapeutic touch -Awareness/use of alternate means of communication -Using listening skills when interacting with the patient and family -Clarifying information where necessary -Interacting effectively with all members of the health care team.

	PERFORMANCE SKILLS	KNOWLEDGE	COMMUNICATION
ASSISTED	<p>Demonstrates safe clinical practice each time observed, while functioning within the hospital's guidelines for Policy & Procedures, Workplace Health & Safety and Infection Control.</p> <p>Functions as an independent practitioner but requires occasional supportive and directive cues.</p> <p>Demonstrates effective time management with frequent evidence of wasted energy.</p> <p>Requires assistance to achieve a sound level of proficient & coordinated clinical practice.</p>	<p>Occasionally uses theoretical knowledge to validate clinical practice.</p> <p>Demonstrates some awareness of research to validate clinical practice.</p>	<ul style="list-style-type: none"> • Occasionally communicates effectively by: <ul style="list-style-type: none"> -Focusing on the client -Using therapeutic touch -Awareness/use of alternate means of communication -Using listening skills when interacting with the patient and family -Clarifying information where necessary -Interacting effectively with all members of the health care team.
MARGINAL	<p>Demonstrates safe clinical practice under supervision, while functioning within the hospital's guidelines for Policy & Procedures, Workplace Health & Safety and Infection Control.</p> <p>Limited ability to function as an independent practitioner, requires frequent supportive and directive cues.</p> <ul style="list-style-type: none"> • Demonstrates little evidence of effective time management with evidence of wasted energy. • Demonstrates a limited level of proficient & coordinated clinical practice. 	<ul style="list-style-type: none"> • Seldom uses theoretical knowledge to validate clinical practice. • Demonstrates limited awareness of research to validate clinical practice. 	<ul style="list-style-type: none"> • Seldom communicates effectively by: <ul style="list-style-type: none"> -Focusing on the client -Using therapeutic touch -Awareness/use of alternate means of communication -Using listening skills when interacting with the patient and family -Clarifying information where necessary -Interacting effectively with all members of the health care team.
DEPENDENT	<ul style="list-style-type: none"> • Unable to demonstrate safe clinical practice. • Does not function within the hospital's guidelines for Policy & Procedures, Workplace Health & Safety and Infection Control. • Unable to function as an independent practitioner, requires continuous supportive and directive cues. 	<ul style="list-style-type: none"> • No evidence of theoretical knowledge to validate clinical practice. • No evidence of awareness of research to validate clinical practice. 	<ul style="list-style-type: none"> • Never communicates effectively by: <ul style="list-style-type: none"> -Focusing on the client -Using therapeutic touch -Awareness/use of alternate means of communication -Using listening skills when interacting with the patient and family -Clarifying information where necessary -Interacting effectively with all members of the

	PERFORMANCE SKILLS	KNOWLEDGE	COMMUNICATION
	<ul style="list-style-type: none"> • Demonstrates no evidence of effective time management with evidence of wasted energy. • Is unable to perform at a basic level of proficient & coordinated 		health care team.

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Survey of Existing Education/Transition Programs and Resources

Method

A questionnaire was developed to elicit information on; type and role delineation of unit; personnel responsible for unit education; personnel who deliver unit orientation, transitional education support and ongoing education; methods for certifying competence; access of staff to orientation, continuing education and competency development; description of transition or extended orientation program (if applicable); links to post graduate programs; and availability of educational resources (e.g. library services, distance education facilities).

Both the questionnaire and document of definitions, goals, learning objectives and clinical competencies were distributed to all NSW public hospital adult ICUs, with an invitation to participate in the project.

Categorical and numerical data obtained from the questionnaire was analysed in terms of frequency and median (interquartile range, IQR) as appropriate. Comments to individual questions and overall comments were analysed for common themes.

Results

Type of Unit (Q1-3)

Forty-three ICUs were included in the survey and questionnaire responses were received from 29 units (return rate of 67%). Seventeen (59%) of the units were metropolitan (i.e. Sydney metropolitan area) and twelve (41%) were non-metropolitan or regional units. Returns were received from 14 of the 18 (78%) level 5 or 6 units and included all but one of the tertiary referral units and all the major regional units. Nine units reported being designated level 4 role delineation although four of these were functionally level 5 units (level 4/5 units).

The majority (n= 25, 86%) of the units represented in the responses to the questionnaire were combined units (i.e. ICU plus one or more of High Dependency Unit, Coronary Care Unit, Cardiothoracic ICU, Neuro ICU, or Paediatric ICU). The majority of units (n=14, 48%) had a level 4 to 5 role delineation, whilst 4 (14%) units were level 3 and 9 (31%) units level 6 .

Responsibility for Education / Orientation (Q4-6)

The vast majority of units (>80%) reported having an orientation program, support for continuing education and ongoing competency development. Twenty five units (86%) identified who was responsible for education within their units. Clinical Nurse Educators (CNE) were responsible for education in the majority of units (n=18, 72%). A Nurse Educator (NE) was responsible in five units (20%) whilst a Clinical Nurse Specialist (CNS) and Clinical Nurse Consultant (CNC) were responsible in one unit each. However, four

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regional units (three level 4 combined ICU/HDU/CCU and one level 3 HDU) did not have a supernumerary position responsible for education. In these units, education fell to the NUM and CNS and the NUM was required, at times, to take a patient case load.

In twenty units (69%) the specific education role was staffed at least at one full-time equivalent (FTE) level. Again, there was a disparity between the level 6 metropolitan units and the regional units, with all metropolitan level 6 units generally having a CNC, NE and/or CNE (from 1.5 to 3 FTEs) participating in education. One regional level 4 (0.5 FTE), and two regional 4/5 (0.64 and 0.42 FTEs) reported having an education position of less than one FTE.

A range of positions held responsibility for unit orientation and, where available, for the transitional education support programme. These include RNs, CNSs, NEs, CNEs with some units having a combination of individuals responsible, e.g. CNC and NE/CNE and in the smaller units, CNS/NUM. Responsibility for the coordination of the unit orientation and transitional education support generally fell to CNEs or NEs (n=19, 66%). In some units it was the NUM who coordinated unit orientation. Again, there was sharing or responsibility between a number of positions. Responsibility for ongoing education showed a similar profile to the responsibility for unit orientation and transitional education.

Asked to "Describe how you ensure that nursing staff commencing work in your unit can provide "safe and effective" nursing care (eg. competencies, subjective cues, audit, incident monitoring)" the common themes in the responses were "competency assessment", "competency workbooks / education packages", "mentoring/preceptoring/buddying", "incident monitoring", and "supervision" .

Twenty seven units (97%) reported that all new staff have access to unit orientation. The two where this was not the case were regional level 4 units. The same results apply to continuing educational support whilst 6 units (four regional level 4, one regional level 3 and one metropolitan level 5) did not undertake ongoing competency development.

Access to Orientation and Continuing Education (Q7)

Description of Existing Transition / Extended Orientation Programs (Q8)

Availability of Post Graduate Education (Q8,9)

In response to the question "Please describe your transition / extended orientation program" a considerable variety of programs were described that varied in length of program, supernumerary time and target group. However there were some recurring features;

- The need for substantial supernumerary time (ranging from 2 to 28 days) for unit orientation and preliminary education.
- "Basic" competency development and assessment over a substantial period of time (up to 6 months).
- Targeting the needs of New Graduates.
- Use of resource material such as competency assessments, worksheets, learning packages.
- Mentorship and preceptoring, "buddied" with experienced RN.

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The length of transition or extended orientation programs varied from a minimum of 1 month to a maximum of 15 months (median (IQR) 4(9) months). The supernumerary time provided also varied considerably ranging from 2 to 28 days (median (IQR) 10(13) days). Nine units reported that certificates were presented upon completion of the program. Nine units indicated that a hospital based postgraduate intensive care course was available as well as access to a university and/or College of Nursing program. A university and/or College of Nursing program were the only options for the remainder. Opinion was evenly divided in response to the question "Should intensive care orientation / transition programs be integrated with post graduate specialty education programs?" with 12 (46%) "yes" and 14 (54%) "No" responses.

Education Infrastructure

Units reported they had access to a range of distance education tools including video conferencing, teleconferencing, and internet although access was often restricted and limited by availability of computers. However four regional units (one level 3, two level 4 and one level 4/5) did not have access to video conferencing facilities. Eleven units reported that they did not have access to a teaching or tutorial room and all but one unit reported that they had access to a librarian / library (although very limited in some units) and current critical care texts and journals.

Commentary

The survey of educational resources indicated that generally ICUs had access to educational support although four units reported that they did not have a supernumerary educational position. Although the vast majority of units provided an orientation program some did not and some units reported that they did not offer support for continued competency development. Although there were common themes in terms of the educational methods and tools used in the orientation period and the methods used to assess attainment of the ability to provide "safe and effective" care there was marked variability in the length of time over which this occurred. There was also considerable variability in the amount of supernumerary time available for orientation.

The variability evident in the survey may reflect the lack of a common standard or definition for "orientation" or "transition". It may also reflect the fact that length of time and resources that are applied to orientation are limited by supply or availability of educational personnel and funding to support supernumerary time. The variability between units may not only reflect different clinical needs but reflect inequality in the resources that are dedicated to unit based education. Although not explicitly stated in the survey, there is a suggestion that the more extensive transition / orientation programs form a continuum of competency development with unit-based post graduate programs.

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**Appendix: Transition to Intensive Care Nursing Survey of Existing
Education/Transition Programs and Resources - Results**

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1.

ORANGE BASE HOSPITAL

Sutherland Hospital
Hornsby Hospital
Bathurst Base Hospital
Concord Hospital
St George Hospital
St Vincents Hospital (public)
Lismore Base Hospital
Westmead Hospital
Manly Hospital
Prince of Wales Hospital
Goulburn Base Hospital
Griffith Base Hospital
Royal North Shore Hospital
The Wollongong Hospital
Wagga Wagga Base Hospital
Bankstown-Lidcombe Hospital
Dubbo Base Hospital
Mt Druitt Hospital
Coffs Harbour Hospital
Blacktown Hospital
Royal Prince Alfred Hospital
Bega Base Hospital
Gosford Hospital
Liverpool Hospital
Shoalhaven District Hospital
John Hunter Hospital
Tamworth Hospital
Port Macquarie Base Hospital

2. TYPE OF UNIT, (EG ICU, COMBINED ICU HDU, ETC):

ICU	2 (7%)
ICU/HDU	12 (41%)
ICU/HDU/CCU	8 (28%)
ICU/CTICU	1 (4%)
ICU/CCU	2 (7%)
HDU	2 (7%)
ICU/CTICU/PICU	1 (4%)
ICU/HDU/CTICU/NICU	1 (4%)

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3. ICU Role Delineation as per NSW Department of Health (eg level 4 ICU):	
Level 3	4 (15%)
Level 4	5 (19%)
Level 4 to 5	4 (15%)
Level 5	5 (19%)
Level 6	9 (33%)
4a. Do you have a nursing position that is responsible for education in your unit?	
Yes	25 (86%)
No	4 (14%)
4b. What award classification is this position?	
CNS	1 (4%)
NE	2 (8%)
CNE	18 (69%)
CNC	2 (8%)
NE/CNC	1 (4%)
CNE/NE	2 (8%)
4c. Is this position supernumerary?	
Yes	26 (100%)
No	0
4d. How many FTEs is this position?	
Median (IQR)	1 (0.20)
6 with less than 1.0 FTE	
20 with at least 1.0 FTE	
2 with 2 or greater FTE	

5a. Who delivers your intensive care unit orientation / transitional education support programme?	
RN	1 (4%)
CNS	2 (7%)
NE	3 (10%)
CNE	18 (62%)
CNS/NUM	2 (7%)
CNC/CNE	1 (4%)
NE/CNC	1 (4%)
CNE/NE	1 (4%)
5b. Who is responsible for coordinating your intensive care unit orientation / transitional	

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education support programme?

NE	4 (14%)
CNE	15 (52%)
CNS/NUM	2 (7%)
NUM	3 (10%)
CNC/CNE	3 (10%)
NE/CNC	1 (4%)
CNE/NE	1 (4%)

5c. Who is responsible for **ongoing** education of staff in your intensive care unit?

NE	3 (10%)
CNE	16 (55%)
CNS/NUM	1 (4%)
CNE p/t	1 (4%)
NUM	2 (7%)
CNC/CNE	2 (7%)
NE/CNC	2 (7%)
CNE/NE	2 (7%)

6. Describe how you ensure that nursing staff commencing work in your unit can provide "safe and effective" nursing care (eg competencies, subjective cues, audit, incident monitoring etc)

1. 3 days supernumerary – ideal world. Developing competencies and standards similar to this – based on Gosford clinical portfolio. Poorly done due to low man hours per staff member requiring assistance.
2. Competencies on all equipment completed within 3/12 of commencement. All incidents monitored through IIMS. CNS mentorship program being developed – all new staff placed under CNS who monitors / precepts.
3. All staff are assessed re their abilities on a weekly to monthly basis – via discussion between NUM and CNE. An experience code is available for all staff and clinical co-ordinator to ensure appropriate allocations are made. Tailor made education packages are made for new staff to ensure that there is adequate education given to ensure "safe and effective" nursing and pt care is achieved.
4. Unit orientation, appraisal. Supernumerary for a few days if little or no experience in ICU – would like to offer more time. Allocated time with CNE (1:1) 2nd year grad – as 3rd RN (not 2nd) on shift.
5. Set of competencies to be completed during orientation, monthly, six mnthly etc. - Preceptors monitor progress -Work packages to complete prior to working for background info.
6. Competencies, Orientation workbooks, Attendin orientation workshops/study days.Exams on orientationIncident monitoring.
7. They are provided with an Orientation Booklet which contains basic competencies which they are expected to complete within 3 months. May progress to next level if up to it clinically.
8. We can't – have developed competency / transition program but unable to implement due to local branch NSWNA involvement!
9. Competencies, audits, incident monitoring, staff appraisals
10. Orientation, Observation, Competecies
11. Competency, documentation, learning packages.
12. Extensive orientation program with learning packages, competency based - staff

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- appraisal is competency based – IMMS/RCA – Clinical review.
13. Adhoc at present – discussion with staff member and decision re level of supervision if any / 1 under supervision
 14. Clinical competencies – incident monitoring – supervision
 15. Completion of ICU specific competencies / objectives. Completion of orientation program which encompasses; -Expert supervision -weekly reflective sessions -performance review interviews etc.
 16. Competency assessment
 17. ICU competencies – incident monitoring – audits
 18. Annual assessment of competencies such as CPR/defib/BSL/manual handling/Care of ventilated patient/setup assist with CVL and art line insertion
 - 19.
 20. Audit – incident monitoring (pts, staff complaints) – competencies – worksheets
 21. Competencies – assessments – subjective cues – worksheets – Drug calcs – IMMS – patient care audits – Drug/meds audits
 22. Orientation / mentor program / competency program. -Ethos of learning and self development -Support time – study leave -Inservice program -Staff appraisal and incident monitoring.
 23. Extensive 2 week orientation with lectures / practical skills and clinical floor teaching. Preceptorship Completion of a 1 year workbook involving worksheets and skills assessments. Employment into the Intensive Care Service with no ICU experience is only through the 12 month rotation program, which has been designed for the ICU nurse with no or < 1 year experience. This involves 3 month appraisals reviewing progress and completion of staged workbook. Rotations into each speciality unit is part of the program with orientation and support during each ICU speciality rotation. Workshop attendance is expected (S/L is granted) covering topics such as CRRT/Haemodynamics/Neuro/IABP/ALS/Trachy/ventilation.\
 24. We share a CNC who works 0.5 FTE across 4 hospitals – two divisions – therefore have very low input / support.\
 25. Staff are required to work through a competency workbook. Incidents are monitored for trends etc.
 26. Staff are required to work through a competency workbook. Incidents are monitored for trends etc.
 27. Supernumerary period, buddy system –Competencies -Orientation program -Regular audits –IIMS
 28. Created a program to assess and evaluate prior learning eg. Skills, knowledge, competencies in about 50 key areas of critical care. IIMS.
 - 29.
 30. Orientation manual to develop and enhance working skills - Critical care course and competency based assessment. - ACLS course mandatory - Advanced skills with Aero-Medical Retrieval service offered when nurse has demonstrated superior ICU skills. - ANZICS data base.
 31. A combination of subjective cues and competencies.

7. Do all new staff have access to:

7a. Unit orientation

Yes	27 (93%)
No	2 (7%)

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7b. Continuing educational support

Yes **27 (93%)**

No **2 (7%)**

7c. Ongoing competency development

Yes **23 (82%)**

No **5 (18%)**

8a. Please describe your transition / extended orientation program.

1. 3 days supernumerary. Almost completed competency portfolio and competency standards based on Gosford clinical portfolio. 4 levels of clinical competency
2. We have an ECCY – (Emergency Critical Care Year) for 2nd year RN's – 3 X 4/12 rotations to ICU/CCU/ED – with workbooks and 6 study days – 2 for each area and competencies
3. Orientation packages that covers the layout of unit, monitor and machine usage. Basic ventilation, haemodynamic monitoring and ICU pt care and routine in ICU. Tailor made packages and goal setting done depending on staff level of experience.
4. 2nd year New Grad program (Critical Care)
5. 13 days supernumerary - Month working alongside preceptor on same shift – Work packages, workshop, accreditation of essential skills.
6. 2 – 3 days with educator / CNC no patient contact – to familiarise within unit protocols, education plan. 1 week with educator / CNC with patient to orientate at bedside. 3 week preceptorship with another staff member. Over next 3 months attends 3 study days of education and exams on orientation workbooks X 3
7. For new staff – No experience – ie New grads. They receive 2 Days of Orientation with CNE plus 3 days supernumerary time with their preceptor plus one month preceptorship. If required – preceptorship is extended – but assessed on an individual basis requirements.
8. n
9. n
10. 2nd year new grads apply to do Acute Care Course – includes 6 mnths ICU / 6 mnths ED. Students sent on "Foundation of IC Course run at area – 6 days over 3 mnths – Also given learning packages / goals / competencies.
11. Unit orientation - Supernumerary with preceptor - Learning packages, competencies. - Acute Care Foundation Course – 5 workshop days, learning packages, competencies - Professional Certificate – 12 months – 7 workshop days, tutorials, workbooks, presentations, competencies
12. Being paired with one of the CNS's or senior staff as a preceptor. Learning packages for Respiratory, Ventilation, Haemodynamic Monitoring and drugs. Competencies assessed.
13. n
14. 3 months extending to 6 mnths for competency completion. First 2 weeks supernumerary – 2 workbooks.
15. 4 weeks supernumerary – 4 non-clinical days with NE – all other days clinical experience with preceptor.;
16. New staff orientation comprises 2 supernumerary days with CNE support available Adhoc 4 month orientation program developed to address recruitment with funding application to support supernumerary days.
17. n

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18. Clinical ladder type phased learning – ECG monitoring / CVC monitoring / art lines / inotropes / ventilators.
19. n
20. 2-3 supernumerary days buddied – intensive 1:1 inservice lectures – large bank of inservices to work through in their Work Book.
21. Introduction to unit – Supernumerary time. Work with CNE for 1 approx month. Increase critical care skills eg haemodynamic monitoring, non invasive ventilation, ECG and rhythm interpretation, ABGs interpretation, UWSD – Exposure to whatever may be occurring in the unit eg cardioversion. Witness at MET and retrieval calls if suits unit activity – Utilizing competencies / worksheets / packages.
22. Up to 2 months new staff buddied / mentored. - New staff allocated patients – buddy is supernumerary. - Learning packages - Training for mentor / preceptor - Unit based access area based workshops prn
23. as before (6)
24. We have introduced a 3 month rotation in new graduate program which has a critical care package – otherwise it depends on skills brought to organisation. Usually a 2 day supernumerary orientation.
25. Staff have rotations through cardiac, ICU and ED. 3 X supernumerary days in each area prior commencement there. During their rotation they have 2 study days per area.
26. 3 month program, where they are supernumerary for 2-3 weeks depending on previous experience. They have 1-2 hour lectures each day for 2 weeks and 1 day for trachy / inotropes. 3 months to complete workbook.
27. Currently run a new grad program (12 months ICU) – 1 month S/N – combination of lectures, practical sessions. Transition program – individually assessed and time determined.
28. Have offered grad cert in past. RN2 – 1 year program (running for 3 years now). 2 weeks supernumerary orientation with 1 day theory.
29. n
30. On commencement staff receive a 5 day supernumerary orientation program supported and supervised by CNE along with the involvement of senior ICU nursing staff. New staff receive an orientation package that outlines operational performance of the unit and helpful information for new starters. Learning packages, workbooks, and reference material is included in this package. All new staff members must achieve certain basic competencies with three (3) months of commencement, and achieve additional critical care competencies (eg NIV, ACLS, ALS, Haemodynamic monitoring etc) over 12 months.
31. Our program exists as part of the new graduate programme and the graduate will spend 3 months in our unit generally as their third final rotation.

8b. Length of program

Median (IQR)	4 (9) months
Minimum	1 month
Maximum	15 months

8c. Supernumerary time

Median (IQR)	10 (13) days
Minimum	2 days
Maximum	28 days

8d. Certificate on completion?

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Yes	9 (35%)
No	17 (65%)
8e. Assessment tools	
Yes	21 (84%)
No	4 (16%)
8f. Learning packages	
Yes	25 (96%)
No	1 (4%)
8g. Competency assessments	
Yes	25 (96%)
No	1 (4%)
8h. Are staff members assigned a mentor or preceptor?	
Yes	25 (93%)
No	2 (7%)
9. What postgraduate intensive care courses are available to your staff?	
Uni	1 (4%)
C of N	6 (22%)
C of N/Uni	12 (43%)
C of N / Uni/hospital	9 (32%)
10. Should intensive care orientation / transition programmes be integrated with postgraduate specialty education programmes?	
Yes	12(46%)
No	14 (54%)
11. What distance education resources are available for intensive care nursing staff?	
Intranet	7 (24%)
Video Conf/ internet / teleconf	1 (3%)
Internet / Intranet	6 (21%)
Video Conf/ internet / intranet / teleconf	11 (38%)
Internet / intranet / tele conf	2 (7%)
Video conf / internet / intranet	2 (7%)
12. Do you have a tutorial room available for teaching?	

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Yes	17 (61%)
No	11 (39%)
13. Do you have access to a librarian / library and current critical care texts / journals?	
Yes	28 (97%)
No	1 (3%)

General Comments

12. This program looks great but we in the country do not have access to staffing available in the city. Goulburn is a 100 bed hospital and there is only one CNE and she is in theatres. The CNC's are area based so not able to provide support or education on a daily basis. We have a 6 bed ICU designated level 4 but only 2 RN's per shift and try to call in staff if we have a ventilator. Thus the ability to provide education support is limited.

22. Keeping it Unit based allows for individualised adaptation especially in 16 bed unit. Staff can cover all shifts including w/ends if not complicated by too many demands (external).

24. Difficulty for us being small rural facility and many role for few is largely – relevant / up to date protocol manual – onsite clinical educator support (lack of)

25. Having read your Transition to ICU Competency Statements – I think this would need to be a post grad uni or College level course. Our transition to practice program as it stands is a fairly “shallow” introduction to ICU/ED and CCU.

28. This program is desperately needed especially with the university sector taking over many grad cert specialist programs that are too “generic” and do not meet the demands of a practice discipline, that is rapidly changing, highly technical and where accurate clinical judgement is paramount. This program is very comprehensive and would set the RN in an excellent position towards becoming “critical care specialist RN”. This program should offer excellent pre req knowledge/competence to go onto a grad certt – if not – the RN should get significant RPL towards a masters.

If you have the opportunity – look at the Grad Cert of Adv Nursing Practice at Newcastle Uni. There are only 2 trimesters specific to ICU nursing (a total of 24 weeks) of which – the student doesn't have to be working in an ICU to do the first (specialty A) trimester. In essence, an RN can get a grad cert – specialising in ICU – and only work (supernumerary) in ICU for 12 weeks (Specialty B).

The ACCCN and National Review rec that a national standard be established – your program may be a solution. At least it would be consistent and has a clear clinical focus.

I applaud your efforts and would like to be considered for any future discussions. I will be submitting my PhD thesis this year – and my topic is “How RNs make the transition towards becoming Specialist RNs”. My sample was ICU post graduate (grad cert) nursing students. I hope to begin publishing my findings this yr.