



College of Intensive Care Medicine
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MINIMUM STANDARDS FOR INTENSIVE CARE UNITS

INTRODUCTION

This document outlines the minimum standards relating to work practice, caseload, staffing and operational requirements, design, equipment and monitoring for Level III, II, I and Paediatric Intensive Care Units (ICUs). 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. The standards outlined in this document define the resources required to provide safe patient care and best outcomes for each level of ICU. ICUs seeking accreditation for training in intensive care medicine should refer to Professional Document IC-3 *Guidelines for Intensive Care Units seeking Accreditation for Training in Intensive Care Medicine*. However, it is the expectation of the College that all ICUs approved for training will also meet the standards outlined in this document.

DEFINITION

An Intensive Care Unit (ICU) is a specially staffed and equipped, separate and self-contained area of a hospital dedicated to the management of patients with life-threatening illnesses, injuries and complications, and monitoring of potentially life-threatening conditions. It provides special expertise and facilities for support of vital functions and uses the skills of medical, nursing and other personnel experienced in the management of these problems. In many units, ICU staff are required to provide services outside of the ICU such as emergency response (e.g. rapid response teams) and outreach services. Where applicable the hospital must provide adequate resources for these activities.

GENERIC REQUIREMENTS FOR INTENSIVE CARE UNITS

Depending upon the designated level, function, size and case mix of the hospital and/or region that it serves, an ICU may range from four to over 50 beds. Large ICUs should be divided into pods of 8-15 patients.

1. 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 resources.

1.1 Medical Staff

Each ICU must have a medical director who takes overall responsibility for all aspects of the operation of the Unit in accordance with this and related CICM professional documents. The director should be a Fellow of the College and have a full time commitment to the role, although these requirements cannot always be met in Level I ICUs. There must be sufficient specialist staff with experience in intensive care medicine to provide for patient management, administration, teaching, research, audit and ICU based activities outside of the ICU as required. Duties outside of the ICU must be staffed by personnel additional to those required for managing patients within the ICU, and must not compromise care of patients within the ICU.

The ICU specialist roster must allow reasonable working hours and leave of all types. Employment of locums may be necessary to cover leave in smaller ICUs. There must be at least one specialist rostered to the unit at all times. In larger ICUs more than one specialist should be rostered to the Unit (one per pod of 8-15 beds). All specialist staff must meet the CPD requirements of the College.

There must be at least one other registered medical practitioner with an appropriate level of experience rostered to the ICU at all times. These medical practitioners must have appropriate orientation and training and be competent in providing advanced life support. There must be access to a range of specialty consultants appropriate for the designated role of the hospital.

1.2 Nursing Staff

The appropriate 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, methods of rostering, as well as individual policies for support and monitoring in each unit.

The Australian College of Critical Care Nurses (ACCCN) guidelines require a minimum of 1:1 for ventilated and other critically ill patients, and 1:2 nursing staff for lower acuity patients (clinically determined). Greater ratios may be required for patients requiring complex management. There must be a nurse in charge of the unit with a post registration qualification in intensive care. There should be a supernumerary team leader in charge of each ICU or pod per shift who is a designated senior nurse with a post-registration qualification in intensive care. ACCESS (Assistance Coordination Contingency Education Supervision Support) nurses may be required depending upon the number of nurses with post registration qualifications in intensive care. The majority of nursing staff should have a post registration qualification in intensive care. All registered nurses must be competent in providing advanced life support and undertake refresher training annually. All nursing staff responsible for direct patient care should be Division 1 registered nurses. Enrolled nurses (Division 2 RNs) may be allocated duties to assist registered nurses. However, any activities that involve direct contact with the patient must always be performed in the immediate presence of a Division 1 registered nurse.

1.3 Other Staff

Depending on the needs of the unit, physiotherapists, radiographers, dieticians, technicians (including biomedical engineering and scientific officers), social workers/Aboriginal liaison/Maori liaison, occupational therapists, interpreters, pastoral, clerical and cleaning 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. Larger ICUs should have an equipment officer to coordinate and oversee the selection, purchase and maintenance of equipment and disposables for the Unit, and a research coordinator to coordinate research activities and to collect and store research data.

1.4 Educational

The unit should have a documented educational program for medical, nursing and other staff. There should be at least one nurse educator for every 50 nurses on the roster. Larger units should have an inter-professional education coordinator to manage educational activities in the unit.

2. OPERATIONAL

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. There must be defined policies for patient care and drug administration, and admission, discharge, referral and evacuation of patients. These should be immediately available to all staff, preferably on the hospital intranet. There should be a surge capacity plan to cope with an emergency/epidemic.

Clinical management of the patient must be achieved within the framework of agreed policies (e.g. procedural and infection control, including defined antibiotic policies). All patients admitted must be referred for management to the rostered intensive care specialist. Clinical management should include two bedside ward rounds per day conducted by the rostered intensive care specialist and junior medical staff and nursing staff.

All units should have documented and demonstrable procedures for formal audit, peer review and quality assurance. An active research plan is desirable. Services required on a 24 hour basis include imaging, laboratory and other diagnostic facilities.

3. STRUCTURE OF AN ICU

3.1 Siting

The ICU should be a separate unit within the hospital with access to the emergency department, operating theatres, radiology, and interventional cardiology and trauma unit where relevant.

3.2 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 must be considered. The total area of the ICU should be 2.5-3 times the patient care area.

- 3.2.1 *Patient area* – in adult ICUs at least 20m² of floor area is required for each bedspace in an open area exclusive of service areas and circulation space. Single rooms should be at least 25 m². Paediatric ICUs may use less than 20m² when using cots rather than beds. There must be adequate access to the head of each bed.

At least one wash basin with elbow or foot-operated taps for every two beds is recommended and one for each bedspace is preferred. At least one single room capable of isolation procedures should be available for every six beds. Each isolation room should have its own wash basin, en suite and appropriate facilities for isolation such as an ante room of at least 3m² and control of air flow.

There must be an adequate number of service outlets depending on the purpose of the unit. A Level III unit will require at least four oxygen, three air, three suction and four data 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. Service outlets and lighting must comply with standards prescribed by the appropriate authority. Adequate and appropriate lighting for clinical observation must be available and there must be individual light controls for each patient with capacity for dimming.

For the psychological well-being of patients and staff, windows with access to natural light allowing a clear day/night distinction and bed access to the exterior are desirable features. A clock at each bedspace is useful for patient orientation. Sound absorbing materials should be used for floor coverings etc. Design of the unit should take into account the need for patient privacy.

- 3.2.2 *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 collection equipment and storage of stationery. Adequate space for a receptionist and/or ward clerk must be available.
- 3.2.3 *Environment* – the unit should have appropriate air conditioning which allows control of temperature, humidity and air change.
- 3.2.4 *Pharmacy/drug preparation area* – for clean and rapid drug and fluid preparation.
- 3.2.5 *Equipment storage area* – e.g. for monitors, ventilators, infusion pumps, dialysis equipment, disposables, fluids, drip stands, trolleys, blood warmers, suction apparatus, linen, large items of special equipment.
- 3.2.6 *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.
- 3.2.7 *Staff facilities* – should be sited close to the patient area and have adequate communication with it. They should allow for relaxation and debriefing during breaks.
- 3.2.8 *Seminar room* – should be situated close to the patient area with adequate communication and be equipped with seating, audio visual aids, wall boards and other teaching aids.
- 3.2.9 *Nursing offices* – separate offices must be provided at least for the Nurse in Charge and Nurse Educator/s.
- 3.2.10 *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.
- 3.2.11 *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 must be available and overnight rooms for relatives should also be considered.

- 3.2.12 *Secretarial area* – a separate area should be available for departmental secretarial assistance. There must be space for storage of records.
- 3.2.13 *Computing facilities* – a separate area should be designated for computerised patient data entry and analysis. Confidentiality should be built into any system.
- 3.2.14 *Cleaners area* – for storage of equipment and materials.
- 3.2.15 *Workshop and laboratory* – should have blood gas machine which allows stat measurement of blood gases, simple electrolytes, haemoglobin and facility to measure blood glucose.
- 3.2.16 *Library facilities* – an appropriate range of bench manuals, textbooks, journals and access to electronic medical information and the hospital intranet should be available 24 hours a day within the ICU.

4. EQUIPMENT

- 4.1 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.
- 4.2 There must be a regular system in place for replacement and checking the safety of equipment.
- 4.3 Basic equipment should include:
- ventilators for invasive and/or non-invasive ventilation
 - hand ventilating assemblies
 - suction apparatus
 - airway access equipment, including a bronchoscope and equipment to assist with the management of the difficult airway
 - vascular access equipment
 - monitoring equipment, both non-invasive and invasive
 - defibrillation and pacing facilities
 - equipment to control patient temperature
 - chest drainage equipment
 - infusion and specialised pumps
 - portable transport equipment
 - specialised beds
 - lifting/weighing equipment
 - access to ultrasound for placement of intravascular catheters

Other equipment for specialised diagnostic or therapeutic procedures (e.g. renal replacement therapy, intra-aortic balloon counter pulsation, echocardiography, extra-corporeal membrane oxygenation etc.) 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.

5. MONITORING

Adequate monitoring is a core capability of all Intensive Care Units. The described monitoring methods below are not intended 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, since detection of a problem does not guarantee that treatment is appropriate or possible.

Patient monitoring equipment should be modular, with trending capability, visible and audible alarms and unobstructed, comfortable viewing and capacity for alarm recording and hard copy. Networking capability and uniformity with the operating theatres and emergency department are desirable. There should be a bright high definition screen and all devices must be designed to an appropriate level of electrical safety.

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.

5.1 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.

5.2 Patient Monitoring

5.2.1 *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.

5.2.2 *Respiration* - respiratory function should be assessed at frequent and clinically appropriate intervals by observation, supported by capnography and blood gas analysis.

5.2.3 *Oxygenation* - the patient's oxygenation should be assessed at frequent and clinically appropriate intervals by observation, pulse oximetry and blood gas analysis.

5.3 Equipment for Monitoring the Patient

Available for every patient:

5.3.1 *Electrocardiograph* - equipment to monitor and continuously display the electrocardiograph.

5.3.2 *Pressure monitoring* - equipment to monitor and continuously and simultaneously display arterial, central venous and at least one other pressure (e.g. pulmonary artery, intracranial pressure).

5.3.3 *Temperature* – capacity to monitor central and cutaneous temperature.

5.3.4 *Pulse oximeter*.

5.3.5 *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, and continuously in patients who are ventilator dependent.

5.3.5 *Continuous monitoring of ventilation* – 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.

5.3.6 *Endotracheal cuff monitoring* – equipment to measure cuff pressure intermittently.

5.3.7 *Non-invasive arterial pressure monitoring*.

5.3.8 *Other equipment* - when clinically indicated, equipment must be available to measure other physiological variables such as cardiac output and derived variables, neuromuscular transmission etc.

5.4 **Monitoring of Equipment**

- 5.4.1 *Piped gas supply failure alarm* - there must be piped gas supply failure alarms.
- 5.4.2 *Oxygen supply failure alarm* - an automatically activated device to monitor oxygen supply pressure and to warn of low pressure must be fitted to ventilators.
- 5.4.3 *Oxygen analyser* - an oxygen analyser must be available to measure the oxygen concentration delivered by ventilators or breathing systems.
- 5.4.4 *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.
- 5.4.5 *Humidifier temperature* - when a heated humidifier is in use monitoring of the inspired temperature must be available which alarms at high temperature.
- 5.4.6 *Air embolism* - when a patient is treated by renal replacement therapy, plasmapheresis or circulatory perfusion, monitoring for air embolism must be in use.

5.5 **Equipment for Monitoring for Patient Transports**

Portable equipment for mechanical ventilation and monitoring of ventilation and respiratory and circulatory status as outlined above must be available for patient transports.

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 its size and the number, type and severity of illness of the patients admitted as well as staffing expertise, facilities and support services.

Critically ill children have specific needs and are usually treated in a paediatric intensive care unit. For the purposes of this document rural ICUs may be designated as Level II or Level I. By definition they are present in hospitals serving a population of <99,000 (<25,000 small rural), where there are limited specialist services and where travel to specialist services may take many hours. Issues common to rural ICUs include staff recruitment and referral on to tertiary hospitals for tertiary services. For these reasons the College strongly recommends that an arrangement is made with a designated tertiary hospital so that patients referred can be accepted for specialty management (including ICU management).

6. 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:

6.1 **Work Practice/Caseload**

- 6.1.1 At least 8 and sometimes more than 50 (depending upon clinical activity) staffed and equipped beds to adequately discharge clinical, teaching and research commitments consistent with the functioning of an ICU in a tertiary referral centre.
- 6.1.2 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 400 mechanically ventilated patients per annum.
- 6.1.3 Large ICUs should be divided into smaller areas or 'pods' of 8-15 patients for the purposes of clinical management.

6.2 Staffing Requirements

- 6.2.1 A medical director with a substantial clinical and non-clinical commitment* to the operation of the ICU and who is a Fellow of the CICM. The medical director must have a clinical practice that is predominantly in intensive care medicine and must meet the College's CPD requirements.
- 6.2.2 Sufficient supporting specialists so that consultant support is always available to the medical staff in the unit, and to provide for reasonable working hours and leave of all types and to allow the duty specialist to be available exclusively to the Unit or pod at all times. This will be at least 4.0 FTE and may be many more for larger units (at least 4.0 FTE per pod). For each 4.0 FTE, at least two specialists should have a minimum of 50% involvement in the Unit.
- It is expected that all registered medical specialists in the ICU are Fellows of the College. All specialists must meet the CPD requirements of the College.
- 6.2.3 At least one of the specialists must be exclusively rostered to the unit or pod at all times. During normal working hours this specialist must be predominantly present in the unit or pod, and at all times be able to proceed immediately to it. This specialist must see all patients under his/her care with junior staff at least twice daily and set a management plan, in the form of a structured bedside ward round.
- 6.2.4 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 or pod of 8-15 patients at all times.
- 6.2.5 It is recommended that both intensive care specialists and other registered medical practitioners working in the ICU be required to manage no more than 8-15 intensive care patients. After hours it is acceptable for one intensive care specialist to manage two such pods provided there is an additional intensive care specialist on second call.
- 6.2.6. Most hospitals with Level III ICUs require ICU staff to undertake clinical duties outside of the ICU, such as emergency responses, and patient assessment and review etc. One intensive care specialist and one other registered medical practitioner with an appropriate level of experience will normally be required for these activities.
- 6.2.7 A minimum of 1:1 nursing for ventilated and other similarly critically ill patients (clinically determined) and 1:2 nursing staff for lower acuity patients (clinically determined). Nursing staff should be available to greater than 1:1 ratio for patients requiring complex management (e.g. ventricular assist device, ECMO). There should be a supernumerary team leader in charge of each pod per shift who is a designated senior nurse with a post-registration qualification in intensive care. ACCESS nurses as required depending upon the number of nurses with post registration qualifications in intensive care.
- 6.2.8 A nurse in charge of the unit with a post registration qualification in intensive care.
- 6.2.9 There should be a minimum of 50% (optimum 75%) of nursing staff with a post registration qualification in intensive care for every shift.
- 6.2.10 All nursing staff responsible for direct patient care should be Division 1 registered nurses. Enrolled nurses (Division 2 RNs) may be allocated duties to assist registered nurses, however any activities that involve direct contact with the patient must always be performed in the immediate presence of a Division 1 registered nurse.
- 6.2.11 There should be at least one FTE nurse educator per 50 nurses on the roster. This is in addition to educators running and managing tertiary based Critical Care Nursing courses.
- 6.2.12 Support staff as appropriate, e.g. biomedical engineer, clerical and scientific staff.

6.3 Operational Requirements

- 6.3.1 Defined patient care and drug administration protocols, admission, discharge and referral policies. These should be available on the intranet or otherwise immediately available to staff.
- 6.3.2 Demonstrable and documented formal audit and review of its activities and outcomes, with

participation in the ANZICS CORE or other similar that allows calculation of the standardised mortality ratio (SMR) and benchmarking with other units. There should be at least one full time equivalent data manager per ICU who has received appropriate training for the position.

- 6.3.3 A documented orientation program for new staff.
- 6.3.4 Educational programs for medical staff and a formal nursing education program. There should be an inter-professional education coordinator to manage the education activities of the unit.
- 6.3.5 An active research program. There should be one full time equivalent research coordinator per ICU who has had appropriate training for the position.
- 6.3.6 Suitable infection control and isolation procedures and facilities. Regular liaison with infection control/infectious diseases teams is recommended.
- 6.3.7 24 hour access to pharmacy, pathology, operating theatres and tertiary level imaging services immediately available on site. There must be access to allied health professionals including a dietician, occupational therapist and speech pathologist as required. There must be access to other medical specialists, other allied health practitioners e.g. physiotherapist, social worker, aboriginal liaison officer, Kaiatawhai (Maori liaison officer) on request 24 hours, and access to technical support staff (biochemical engineers and scientific officers) as required.
- 6.3.8 Appropriate clerical and secretarial support. It is expected there will be one ward clerk per pod (8-15 beds), including a weekend presence and at least one FTE secretary per eight intensive care specialists.
- 6.3.9 One equipment officer per ICU.

6.4 **Design**

- 6.4.1 A self-contained area, with easy access to the emergency department, operating theatres and imaging and interventional cardiology and trauma unit where relevant.
- 6.4.2 An appropriate design, providing a suitable environment with adequate space for patient care delivery, storage, staff accommodation (including office space), education and research. There must be a relatives' area with facilities to deal with more than one grieving family.

6.5 **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.

7. **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 an indefinite period providing appropriate specialty support is available within the hospital. Where appropriate specialty support (e.g. neurosurgery, cardiothoracic surgery) is not available within the hospital, there should be an arrangement with a designated tertiary hospital so that patients referred can be accepted for specialty management (including ICU management).

Some training and experience in managing critically ill children preferably with APLS provider status or equivalent, is desirable for medical and nursing staff in rural ICU's. All patients admitted to the unit must be referred for management to the attending intensive care specialist.

A Level II unit should have:**7.1 Work Practice/Caseload**

- 7.1.1 At least six staffed and equipped beds to adequately discharge clinical and teaching functions.
- 7.1.2 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.

7.2 Staffing Requirements

- 7.2.1 A medical director with a substantial clinical and non-clinical commitment* to the operation of the ICU and who is a Fellow of the CICM. The medical director must have a clinical practice that is predominantly in intensive care medicine and must meet the College's CPD requirements.
- 7.2.2 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 at all times. There should be at least 4 FTE specialists of whom two should have an appointment greater than 50%. The majority should be Fellows of the College and all must meet the CPD requirements of the College.
- 7.2.3 At least one of the specialists must be exclusively rostered to the unit at all times. During normal working hours this specialist must be predominantly present in the unit or pod, and at all times be able to proceed immediately to it. This specialist must see all patients under his/her care with junior staff at least twice daily and set a management plan, in the form of a structured bedside ward round.
- 7.2.4 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.
- 7.2.5 Many hospitals with Level II ICUs require ICU staff to undertake clinical duties outside of the ICU, such as emergency responses, and patient assessment and review etc. One intensive care specialist and one other registered medical practitioner with an appropriate level of experience will normally be required for these activities.
- 7.2.6 A minimum of 1:1 nursing for ventilated and other similarly critically ill patients (clinically determined), and 1:2 nursing staff for lower acuity patients (clinically determined). Nursing staff should be available to greater than 1:1 ratio for patients requiring complex management. There should be a supernumerary team leader in charge of each pod per shift who is a designated senior nurse with a post-registration qualification in intensive care. ACCESS nurses as required depending upon the number of nurses with post registration qualifications in intensive care.
- 7.2.7 A nurse in charge of the unit with a post registration qualification in intensive care.
- 7.2.8 There should be a minimum of 50% (optimum 75%) of nursing staff with a post registration qualification in intensive care for every shift.
- 7.2.9 All nursing staff responsible for direct patient care should be Division 1 registered nurses. Enrolled nurses (Division 2 RNs) may be allocated duties to assist registered nurses, however any activities that involve direct contact with the patient must always be performed in the immediate presence of a Division 1 registered nurse.
- 7.2.10 There should be at least one FTE nurse educator per 50 nurses on the roster. This is in addition to educators running and managing tertiary based Critical care Nursing Courses.
- 7.2.11 Support staff as appropriate.

7.3 Operational Requirements

- 7.3.1 Defined patient care and drug administration protocols, admission, discharge and referral policies. These should be available on the intranet or otherwise immediately available to staff.
- 7.3.2 Demonstrable and documented formal audit and review of its activities and outcomes, with participation in the ANZICS CORE or other similar that allows calculation of the SMR and benchmarking with other units. There should be at least one full time equivalent data manager

per ICU who has received appropriate training for the position.

- 7.3.3 A documented orientation program for new staff.
- 7.3.4 Educational programs for medical staff and a formal nursing education program. There should be an inter-professional education coordinator to manage the education activities of the unit.
- 7.3.5 Suitable infection control and isolation procedures and facilities. Regular liaison with infection control/infectious diseases teams is recommended.
- 7.3.6 24 hour access to pharmacy, pathology, operating theatres and tertiary level imaging services immediately available on site. There must be access to allied health professionals including a dietician, occupational therapist and speech pathologist as required. There must be access to other medical specialists, other allied health practitioners e.g. physiotherapist, social worker, aboriginal liaison officer, Kaiatawhai (Maori liaison officer) on request 24 hours and access to technical support staff (biochemical engineers and scientific officers) as required.
- 7.3.7 An active research program. There should be one full time research coordinator per ICU who has appropriate training for the position.
- 7.3.8 Appropriate secretarial and clerical support. A ward clerk must be present in the ICU during office hours and preferably in the evenings and on weekends. There should be one FTE secretary per eight intensive care specialists.
- 7.3.9 One equipment officer per ICU.

7.4 **Design**

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

7.5 **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.

8. **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.

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.

Level I ICUs should have an established referral relationship with a Level II or Level III unit that should include mutual transfer and back transfer policies and an established joint review process.

Provision of mechanical ventilation and simple invasive cardiovascular monitoring for more than 24 hours is acceptable when the treating specialist is a Fellow of the College. In circumstances where the treating specialist is not a Fellow of the College this should only occur within the context of ongoing daily discussion with the referral Level II or Level III unit as outlined above.

Some training and experience in managing critically ill children preferably with APLS provider status or equivalent, is desirable for medical and nursing staff in rural ICUs.

All patients admitted to a Level I unit must be referred to the registered medical specialist taking responsibility for the unit at the time of admission.

8.1 Work Practice/Caseload

The number of ICU beds and number of patient admissions should be sufficient to maintain clinical skills by both medical and nursing staff. The number of beds should be based on demand and have flexibility to meet increased demand.

A Level I unit should have:

8.2 Staffing Requirements

- 8.2.1. A medical director with a substantial clinical and non-clinical commitment* to the operation of the ICU and who is a Fellow of the CICM. The medical director must have a clinical practice that is predominantly in intensive care medicine and must meet the College's CPD requirements.
- 8.2.2 There should be sufficient registered specialists with experience in intensive care medicine to provide a specialist roster of at least 1 in 3. Locums must be provided if this ratio cannot be met. These specialists should meet the CPD requirements of the College. In circumstances where the specialist on duty is not a Fellow of the College, a designated Fellow should be available for advice and support.
- 8.2.3 In addition to the attending specialist, at least one registered medical practitioner with an appropriate level of experience, rostered for the ICU at all times.
- 8.2.4 A nursing staff: patient ratio of 1:1 for all ventilated and other similarly critically ill patients clinically determined), and 1:2 nursing staff for HDU patients (clinically determined).
- 8.2.5 A nurse in charge of the unit with a post registration qualification in intensive care.
- 8.2.6 There should be a minimum 50% of nursing staff with a post registration qualification in intensive care for every shift.
- 8.2.7 All nursing staff in the unit responsible for direct patient care being registered nurses. Enrolled nurses (Division 2 RNs) may be allocated duties to assist registered nurses, however any activities that involve direct contact with the patient must always be performed in the immediate presence of a Division 1 registered nurse.
- 8.2.8 A minimum of two registered nurses present in the unit at all times when there is a patient admitted to the unit.
- 8.2.9 Support staff as appropriate, e.g. biomedical engineer, clerical and scientific staff.

8.3 **Operational Requirements**

- 8.3.1 Defined patient care and drug administration protocols, admission, discharge and referral policies. These should be available on the intranet or otherwise immediately available to staff.
- 8.3.2 Demonstrable and documented formal audit and review of its activities and outcomes. Participation in the ANZICS database or other similar that allows calculation of the SMR and benchmarking with other units is desirable.
- 8.3.3 A documented orientation program for new staff.
- 8.3.4 Educational programs for medical staff and a formal nursing education program.
- 8.3.5 Suitable infection control and isolation procedures and facilities.
- 8.3.6 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.
- 8.3.7 An active research program is desirable.

8.4 **Design**

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

8.5 **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.

9. **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:

9.1 **Work Practice/Caseload**

- 9.1.1 Sufficient staffed and equipped beds (usually a minimum of eight) to provide for its clinical and teaching functions.
- 9.1.2 Sufficient clinical workload to maintain clinical expertise (usually a minimum of 300 patient admissions per annum).
- 9.1.3 Large Paediatric ICUs should be divided into smaller areas or 'pods' of 8-15 beds for the purposes of clinical management.

9.2 **Staffing Requirements**

- 9.2.1 A medical director with a full time commitment to the operation of the ICU and who is a Fellow of the College of Intensive Care Medicine. The medical director must have a clinical practice predominantly in paediatric intensive care medicine and must meet the CPD requirements of the College.
- 9.2.2 Sufficient supporting specialists so that consultant support is always available to the medical staff in the unit, and to provide for reasonable working hours and leave of all types and to allow the duty specialist to be available exclusively to the Unit or pod at all times. This will be at least 4.0 FTE and may be many more for larger units (at least 4.0 FTE per pod). For each 4.0 FTE, at least two specialists should have a minimum of 50% involvement in the Unit.

It is expected that all registered medical specialists in the ICU are Fellows of the College. All specialists must meet the CPD requirements of the College.

- 9.2.3 At least one of the specialists must be exclusively rostered to the unit or pod at all times. During normal working hours this specialist must be predominantly present in the unit or pod, and at all times be able to proceed immediately to it. This specialist must see all patients under his/her care with junior staff at least twice daily and set a management plan, in the form of a structured bedside ward round.
- 9.2.4 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 or pod of 8-15 patients at all times.
- 9.2.5 It is recommended that both intensive care specialists and other registered medical practitioners working in the ICU be required to manage no more than 8-15 intensive care patients. After hours it is acceptable for one intensive care specialist to manage two such pods provided there is an additional intensive care specialist on second call.
- 9.2.6. Most hospitals with Paediatric ICUs require ICU staff to undertake clinical duties outside of the ICU, such as emergency responses, and patient assessment and review etc. One intensive care specialist and one other registered medical practitioner with an appropriate level of experience will normally be required for these activities.
- 9.2.7 A minimum of 1:1 nursing for ventilated and other similarly critically ill patients (clinically determined), and 1:2 nursing staff for lower acuity patients (clinically determined). Nursing staff should be available to greater than 1:1 ratio for patients requiring complex management (e.g. ventricular assist device, ECMO). There should be a supernumerary team leader in charge of each pod per shift who is a designated senior nurse with a post-registration qualification in intensive care. ACCESS nurses as required depending upon the number of nurses with post registration qualifications in intensive care.
- 9.2.8 A nurse in charge of the unit with a post registration qualification in intensive care.
- 9.2.9 There should be a minimum of 50% (optimum 75%) of nursing staff with a post registration qualification in intensive care for every shift.
- 9.2.10 All nursing staff responsible for direct patient care should be Division 1 registered nurses. Enrolled nurses (Division 2 RNs) may be allocated duties to assist registered nurses, however any activities that involve direct contact with the patient must always be performed in the immediate presence of a Division 1 registered nurse.
- 9.2.11 There should be at least one FTE nurse educator per 50 nurses on the roster. This is in addition to educators running and managing tertiary based Critical Care Nursing courses.
- 9.2.12 Support staff as appropriate e.g. biomedical engineer, clerical and scientific staff.

9.3 **Operational Requirements**

- 9.3.1 Defined patient care and drug administration protocols, admission, discharge and referral policies. These should be available on the intranet or otherwise immediately available to staff.
- 9.3.2 Demonstrable and documented formal audit and review of its activities and outcomes, with participation in the ANZPIC Registry or other similar that allows calculation of the SMR and benchmarking with other units. There should be one full time equivalent data manager per ICU who has received appropriate training for the position.
- 9.3.3 A documented orientation program for new staff.
- 9.3.4 Educational programs for medical staff and a formal nursing education program. There should be an inter-professional education coordinator to manage the education activities of the unit.
- 9.3.5 An active research program. There should be one full time equivalent research officer per ICU who has had appropriate training for the position.

9.3.6 Suitable infection control and isolation procedures and facilities. Regular liaison with infection control/infectious diseases teams is recommended.

9.3.7 24 hour access to pharmacy, pathology, operating theatres and tertiary level imaging services immediately available on site. There must be access to allied health professionals including a dietician, occupational therapist and speech pathologist as required. There must be access to other medical specialists, other allied health practitioners e.g. physiotherapist, social worker, aboriginal liaison officer, Kaiatawhai (Maori liaison officer) on request 24 hours and access to technical support staff (biochemical engineers and scientific officers) as required.

9.3.8 Appropriate clerical and secretarial support. It is expected there will be one ward clerk per pod (8-15 beds), including a weekend presence and at least one FTE secretary per eight intensive care specialists.

9.3.9 One equipment officer per ICU.

9.4 **Design**

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

9.4.2 Appropriate design, providing a suitable environment with adequate space for patient care delivery, storage, staff accommodation (including office space), education and research. There must be appropriate accommodation for families.

9.5 **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.

*What constitutes a 'substantial clinical commitment to the unit' will vary a little with the nature of the particular ICU and with the relevant rostering and administrative structures:

- a) For major ICUs administered with a staff specialist model, the minimum clinical commitment must be not less than 70% of the clinical commitment of a full time specialist in that Unit.
- b) For major ICUs that function on a VMO model, the minimum clinical commitment must be approximately the same as undertaken by most of the other VMOs working in that unit.
- c) The non-clinical commitment for a Director in either model would include the majority of the remaining time not involving clinical duties in that Unit with a minimum of the equivalent of 10 weeks each year.
 - This commitment may be reduced by not more than 50% if a significant component of the administrative requirement of the Director is undertaken by other administrative officers.

A Director may only be the Director of two ICUs if the Director undertakes clinical duties in both Units as defined above and if the two Units:

- are administratively networked;
- share common consultant establishments;
- have shared or overlapping educational and quality assurance structures; and

In addition, at least one of the two Units must also have a functional Deputy Director to assist with the administrative duties across the network.

These guidelines should be interpreted in conjunction with the following professional 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*
- 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*

*Promulgated by FICANZCA: 1994
Revised: 1997, 2003 (JFICM)
Republished by CICM: 2010
Revised (CICM): 2011, 2016*

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