CDI Clinical Designs - Cover Sheet*

Document Type	**National Standards**
Document Title	**National Standards for Adult Critical Care Standards**
Document Owner (e.g. NCP)	**Joint Faculty of Intensive Care Medicine of Ireland**
NCAGL	**Dr. Mike O'Connor**
Approved by	**JFICMI**
Unique Identifier Number (UID)	CDI/0178/2.0/2024
Version Number	**V04**
Publication Date	**November 2024**
Recommended Revision Date **	**November 2027**
Electronic Location	**https://jficmi.anaesthesia.ie/wp-content/uploads/2024/12/National-Standards-FINAL-Nov-2024.pdf**

National Clinical Guidelines must use NCR cover sheet if being uploaded onto NCR. Otherwise this cover sheet applies

*** Refer to HSE National Framework for developing Policies, Procedures, Protocols and Guidelines (PPPGs)***

Version	Revision Date	List Section Numbers Changed	Author
V04	November 2024		JFICMI

Joint Faculty of Intensive Care Medicine of Ireland

National Standards for Adult Critical Care Services

2019

Updated Nov 2024

National Standards for Adult Critical Care Services 2024

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1. Introduction

Critical care units provide life-sustaining treatment for critically ill patients with acute organ dysfunction due to potentially reversible disease. Staff working in critical care units diagnose and treat patients with acute and critical illness, and provide organ support to patients with organ failure. Patients at risk of acute decompensation of known chronic diseases may also benefit from critical care at times of physiological stress, for example after major surgery or in the setting of recent polytrauma.

A critical care service comprises appropriately trained and accredited doctors, nurses and health and social care professionals (HSCP) based in a critical care unit (see below), which has an appropriate governance structure, follows healthcare quality and patient safety guidelines and adheres to national and international best practice guidelines.

A critical care service is appropriate for the care of patients requiring Level 2, 3, and 3s critical care, generally delivered within a high dependency unit (HDU) or an intensive care unit (ICU). For the purposes of this document, the term critical care unit refers to HDU and ICU.

Governance and operational standards support the delivery of high quality, safe patient care in a working environment conducive to best practice, which, in particular, includes a patient's right to timely access to critical care services according to their clinical need. Timely access requires an appropriate configuration of critical care services and adequate number of critical care beds operating at no greater than 85% capacity [1,2] in keeping with analyses for adult and paediatric critical care services in Ireland [3].

The recommendations herein represent the minimum recommended standards required in Ireland for a critical care unit. This is not an exhaustive list of requirements: it is accepted that these standards will evolve over time, commensurate with the ever-changing dynamics of health care. It is also recognised that some existing critical care units do not yet satisfy these minimum requirements (in terms of size, facilities or staffing). It is the responsibility of these units to design and implement strategies to reach these standards as soon as possible. Moreover, all new-build critical care units should strictly adhere to these standards.

Critical care units seeking approval, or seeking to maintain existing approval, for training accreditation with the JFICMI are expected to meet these standards as outlined in the JFICMI Periodic Visitation Record.

These standards pertain to care of critically ill adults. Standards of care for Paediatric Intensive Care services and the care of critically ill children in non-pediatric ICUs are outlined in the Model of Care for Paediatric Critical Care 2019.

2. Levels of Critical Care

Critical Care provides curative and life-support treatment for the critically ill patient. The level of critical care is best defined by the patient's clinical condition and their level of need for critical care.

Levels of care as determined by clinical need have been usefully defined by the Intensive Care Society (UK) 2009 [5] and the Welsh Assembly [6]. The College of Intensive Care Medicine of Australia and New Zealand (CICM) include aspects of staffing and resourcing in the definition of Intensive Care [1,7], as does the European Society of Intensive Care Medicine (ESICM) [8]. The Society of Critical Care Medicine (SCCM) also includes aspects of staffing, interventions and facility and recommends "that all hospitals determine the level of critical care services offered in keeping with their mission and goals as well as regional needs for this service" [9,10]. All these reports and standards documents articulate the need for critical care to manage the right patients in the most suitable facility by an appropriately trained team of professionals.

In terms of the categorization of Critical Care Units, the JFICMI and ICSI recommend that the level of Critical Care is defined by the level of clinical care provided by the Critical Care Unit (see table 1).

Description	Care level	Healthcare environment	Healthcare staff
Acute Care	Level 0	Hospital ward	Physicians/ Surgeons / Ward staff
	Level 1	Post-anaesthesia care unit	Surgeons / anaesthesiologists / Nurses
Critical Care	Level 2	High-dependency unit for critically ill patients with primarily single-organ failure	Critical care team
	Level 3	Intensive care unit for critically ill patients with two or more organ failures	Critical care team
	Level 3s	Intensive care unit which includes subspeciality critical care or regional/national service	Critical care team

Table 1: Levels of care in a hospital setting, including examples of appropriate environments and staff working in these environments

Critical care encompasses both level 3/3s intensive care and level 2 high dependency care. Regarding the operation of these levels of critical care facilities, the JFICMI and ICSI recommend:

- Hospitals should provide their critical care service with appropriate resources to treat patients with organ failures if that hospital service admits acutely ill medical

and surgical patients or provides specialist surgical, or other specialist services to patients at risk of clinical deterioration. Depending on the care level of the critical care services, these resources include the ability to effectively and safely deliver invasive mechanical ventilation, vasoactive drug infusions, continuous renal replacement therapy, invasive cardiovascular monitoring, neurocritical care monitoring, advanced cardiovascular therapies (e.g. ECMO).

- All critically ill patients should be managed by a critical care service under a single governance structure, appropriately resourced to provide that service. Guidelines for governance, resourcing, staffing and physical facilities are addressed elsewhere in this document.

- Level 2 and Level 3 critical care services may co-exist within one critical care facility. Local case-mix and strategic goals determine best configuration.

- The size of a critical care unit cannot be ideally defined in terms of bed numbers alone. This is better described in terms of the requirements of care for a given patient cohort as well as being guided by the bed occupancy rates of the critical care unit.

- For maintenance of skills and professional competencies (and for JFICMI training accreditation), a critical care service should (a) admit and manage at least 200 patients requiring level 3 care each year and (b) have >/= 6 beds [1, 2, 11]. Major referral ("hub") hospitals, as defined in the Critical Care Programme Model of Care [12], require > 8 beds and should admit and manage at least 400 patients requiring level 3/3s care each year.

- An appropriately resourced and staffed critical care service should be able to provide comprehensive critical care. Transfer to a Level 3s critical care service may be required for specialist intensive care treatments (e.g. extracorporeal membrane oxygenation, burns management, trauma care, neurocritical care, hepatology critical care) or to facilitate patient management by non-critical care teams (e.g. surgical subspecialties, haematology, trauma surgery).

- Critical care retrieval (critical care patient transport service) is an integral part of a comprehensive critical care service, both at a local and national level. ICUs may elect to participate in local critical care retrieval services based on need and the availability of appropriately trained medical and nursing staff. The retrieval service remains under the governance of the National Transport Medicine Programme.

3. Guidelines for Admission to Critical Care

These guidelines are not exhaustive nor address all potential clinical circumstances and acute illnesses. They are provided as a guide to assist in the interpretation of levels of critical care services. Clinical expertise and judgment are required on an individual patient basis to ensure that best care is provided in the most appropriate facility.

Level 0 and Level 1 Criteria

Patients in level 0 and level 1 areas do not require management in a critical care unit. Where concern arises related to acute clinical deterioration, the advice of the critical care team may be sought. These areas include hospital wards and post-anaesthesiology care units (PACU).

Where the only requirement is for non-invasive ventilation (NIV), a suitable facility may include an adequately resourced NIV ward within, for example, a respiratory service, a coronary care unit, or an acute care unit, as determined by the clinical context and expert clinical judgment. Where such therapies can be delivered via tracheostomy, local training and guidelines are required to support such therapies in a level 1 environment.

Level 2 Criteria

Appropriate clinical judgment will determine the best environment for the care of a patient meeting level 2 criteria. Where the only requirement is for increased frequency of clinical monitoring, this may be provided in a level 1 environment. Such a facility may include a suitably resourced observation ward or PACU. In general however, level 2 critical care units are suitable for patients with either single-organ failure or with a requirement for invasive and/or regular clinical monitoring that exceeds the scope of level 1 units.

Respiratory failure:
Patients receiving complex NIV may require management in a level 2 area, for example as part of a process of weaning to level 1 care, or where higher levels of NIV are required and there is a risk of progression to invasive mechanical ventilation.

Cardiovascular failure:
Patients with cardiovascular compromise requiring invasive cardiovascular monitoring, frequent fluid challenge therapy, vasoactive and/or antiarrhythmic drug infusions or management of hypovolaemia, are likely to require therapy in a critical care unit (level 2 or above) as determined by the clinical context and clinical judgment. Where cardiovascular compromise is related to primary cardiac disease (e.g. acute coronary syndrome), management within a coronary

care unit may be appropriate.

Kidney failure:
Intermittent renal replacement therapy is normally managed in a dialysis facility but may require critical care in the context of other organ failures, in particular a shock state.

Neurological compromise:
Neurological therapy requiring protection of the airway, invasive neurological monitoring, continuous anti-seizure drug infusions or targeted temperature management requires management in a critical care unit. Clinical assessment will determine whether this is required in a level 2 or level 3 unit.

Skin compromise:
Dermatological injury involving major skin loss, major soft tissue injury, or extensive burns requires management in a critical care unit. A dedicated appropriately resourced burns units may be appropriate.

Liver failure:
Patients with acute or acute-on-chronic liver disease may require admission to a critical care unit, where concerns are present about the risk of acute clinical deterioration.

Level 3 Criteria

Patients requiring management of two or more organ failures are admitted to level 3 critical care units.

Level 3s Criteria

Patients requiring subspecialty critical care management or access to defined national or regional services are admitted to level 3s critical care units. In addition to all level 3 units, level 3s units also provide advanced subspecialty care, including extra-corporeal life support (ECMO/ECLS), neurocritical care, advanced cardiothoracic care, solid organ transplantation, stem cell transplantation, Car-T therapy, burns care or advanced hepatic care.

4. Clinical Governance

- Critical Care Units should have a designated director (Director of Critical Care Services/Critical Care Lead), with clearly defined rostered time allocated to administrative duties. This allows both for management of the Unit and for engagement with the hospital clinical and administrative leadership to ensure optimal access to and use of critical care resources [1,8,9].

- The critical care director should lead the hospital's multidisciplinary Critical Care Committee, which should report directly to the Clinical Director of the designated hospital Directorate. These standards recognise that corporate and clinical governance structures with their attendant reporting pathways differ between hospitals. Nonetheless, the critical care unit and its director should have representation on clinical, corporate and executive committees within their hospital.

- The critical care director should lead critical care services across the hospital, including steering critical care policy, operational activities, audit, research and admission/discharge guidelines.

- The critical care director should provide overall management and leadership; ensuring that the unit is compliant with national and international best practice as well as maintaining national audit practices (through the National Office of Clinical Audit).

- The role of the critical care director should be recognised by the hospital Clinical Director/Medical Director and be clearly identified within the hospital directorate or equivalent structure.

- The reporting relationship of the critical care director shall be determined by local hospital governance structures but shall include the Clinical Director, Medical Director, Chief Executive Officer, Chief Operations Officer, Chief Financial Officer or their equivalents.

- The critical care director should either be a Fellow of the Joint Faculty of Intensive Care Medicine of Ireland or hold an equivalent qualification. The director of a large critical care unit (>8 beds and >400 level 3 admissions per year) should be on the Specialist Division of the Medical Register of the Irish Medical Council in the subspeciality of Intensive Care Medicine.

- The Unit should have agreed admission and discharge policies. Patients referred for critical care management will be assessed by the critical care clinical team and the decision to admit, retrieve, transfer or to leave, will be decided by the critical care team in conjunction with the referring team.

- Measuring the quality of patient care and clinical outcomes, and audit key performance indicators, requires support from a clinical audit and benchmarking process. All critical care units should be included in the Irish National ICU Audit (INICUA - NOCA) to ensure that the quality of their care is monitored. It is the responsibility of the hospital and the healthcare region in which the critical care unit is located to invest in the appropriate hardware, software, and staffing to support this. The critical care unit should have a consultant lead for quality and patient safety.

- The critical care unit and hospital should have a system in place to enable clinical incident reporting, including a mechanism for analysis, feedback and operational change.

- The critical care director should work in close collaboration with an appointed senior Clinical Nurse Manager, Directorate Nurse Manager (DNM)/Assistant Director of Nursing (ADON), dedicated to the Unit(s). In addition, the director should work in collaboration with senior HSCP and pharmacy staff.

- The critical care director (or a designate) should represent the unit at hospital committees which are particularly relevant to critical care practice. These may include; Infection Prevention and Control committee, haemovigilance committee, drugs and therapeutics committee, resuscitation committee, transitions/escalations of care committee, and/or others as identified within the context of that critical care unit and hospital.

- The unit shall adhere to national standards for Infection Prevention and Control, quality assurance and other defined standards and guidelines which may impact on best care for the critically ill.

- Each unit should have an identified clinical lead for organ donation who, along with nursing support (ODNM), can lead on and support organ donation within the hospital. This should include consideration to donation after brain death (DBD) and donation after cardiac death (DCD).

- A continuing education program is required to ensure staff learning develops in line with rapidly evolving critical care therapies. It should be compliant with the requirements for training, accreditation and maintenance of professional skills of all critical care professionals. A Supervisor of Education & Training may be appointed / nominated to oversee this program.

- Nursing management should consist of a clinical nurse manager (CNM 2) who runs the unit (or clinical area within a larger unit) for each shift and does not have direct individual patient clinical responsibilities during that shift. CNM 2 staff

report to a clinical nurse lead (CNM 3) with overall responsibility for nursing in the unit.

- The clinical nurse lead will, in turn report to the DNM/ADON or otherwise as appropriate to local hospital structures. The clinical nurse lead should have a defined management role and function, leads the nursing team in the Unit, supervises their education and training and in conjunction with the critical care director and the multidisciplinary team, and influences the clinical direction of the Unit.

5. The Intensive Care Unit – Minimum Requirements

The design of an intensive care unit for any hospital should address:

5.1 Infrastructure and building standards, acknowledging both the key design features of the ICU and the appropriate location for the unit (ideally in close proximity to operating theatres, emergency department, coronary care unit and radiology

5.2 Floor plan and appropriate bed space areas, taking account of patient visibility and patient safety.

5.3 Accessibility – the right number of beds for case-mix and referral base

5.4 Patient-centred design (noise minimization, appropriate lighting, windows), which are also features of a workplace promoting staff wellbeing

5.5 Ergonomic working environment

5.6 Infection Prevention and Control standards

5.7 Patient Dignity

5.8 The needs of families and next-of-kin, including family room(s)

5.9 Accessibility and patient flow within the hospital – patient movement to and from operating room, emergency department, radiology department, cardiology catheterisation laboratory, interventional radiology suite etc.

5.10 Integration within and across hospital systems – e.g. IMS/EHRs, including a unit CIS which links with the NOCA database and ideally links with the hospital-wide CIS (if one exists)

5.11 The needs for adequate storage space for necessary equipment with proximity to the clinical area. This includes designated area(s) for cleaning equipment.

5.12 Accommodation close to the unit for the on-call doctor(s)

5.13 Rest area(s) for critical care staff (including lockers, change areas, showers and appropriately sized staff dining area)

5.14 Sufficient workstations and WOWs (workstations on wheels) for accessing and submitted data on patients' electronic health records

5.15 Office and administrative spaces for staff within the critical care team (consultant, non-consultant hospital doctors, nursing, nurse managers, nurse educators, practice coordinators, audit staff, IMS staff, health and social care professionals, secretarial and administrative staff – see below)

5.16 The educational needs of the critical care team (study areas,

education room with multimedia equipment, simulation equipment)

5.17 The research needs of the critical care team (storage, optional refrigeration area for study reagants, optional laboratory area)

Such design is open to change as new concepts and processes evolve. Infection Prevention and Control standards need to be adhered to, with particular reference to the numbers of single rooms, neutral pressure rooms and airborne isolation rooms. The specialty case mix will help determine the numbers of airborne isolation rooms.

Design and building standards and infection control standards as referenced below are subject to revision and up-dating. The HBN 04-02 (NHS) [13] and SARI Guidelines [14] remain appropriate for 2024 and should be considered the standard of the day.

The design and building of critical care units must include all stakeholders (including senior intensive care doctors, senior nursing staff , HSCP, pharmacy, laboratory and support staff as well as senior hospital management) involved in the day-to-day workings of the unit from its inception through to its completion. The views of these groups should be incorporated into the overall design from location within the hospital, its size and how it integrates within the hospital.

6. Staffing

6.1 Medical staff

6.1.1 Overview of medical staffing

Every critical care unit should have 24-hour availability of a dedicated consultant in intensive care medicine (ICM). During daytime hours, this consultant should have exclusive sessional duties in the critical care unit no other conflicting clinical commitments [15]. For out-of-hours cover, larger units (>8 bed and/or > 400 level 3 admissions per year) should have a dedicated ICM consultant with no conflicting on-call duties. While international recommendations suggest that this should also apply to smaller units (>/= 6 beds and/or >200 level 3 admissions per year) [1], the JFICMI recognises ongoing manpower deficits in these units and recommends that hospitals work toward this standard over a 5-year cycle. In the interim, smaller units must have an appropriately trained consultant who is immediately available to attend critically ill patients. If they have conflicting on-call commitments, a second consultant must be available to release the ICU consultant to attend to critically ill patients at any time. This is consistent with a 2+2 model of critical care delivery.

It is desirable that consultant sessions be provided by a specialist who is a Fellow of the Joint Faculty of Intensive Care Medicine of Ireland. New appointments should fulfil the accreditation criteria of either "Consultant with a Special Interest in Intensive Care Medicine" or "Consultant in Intensive Care Medicine", applicable to all base specialities in accordance with Higher Professional Training schemes endorsed by the Irish Medical Council.

The critical care medical team also includes non-consultant hospital doctors (NCHDs), who can comprise doctors in training (anaesthesiology, medicine, emergency medicine, surgery or intensive care medicine), doctors in standalone critical care posts, intern-grade doctors, or international medical graduates.

Multi-disciplinary access and input to critical care is essential, with particular need for consultants in microbiology/infectious disease, interventional radiology, and acute medicine/surgery. This is in addition to consultants identified and resourced to support national or regional specialties.

6.1.2 The duties of the consultant in a critical care unit include:

- Providing clinical care to the patients in the critical care unit
- Assuming overall responsibility for the patients in the critical care unit (depending on local practices and clinical governance, it may be appropriate that this responsibility is shared with a non-ICU medical or surgical team)
- Being available for consultations regarding patient care including the potential for intra- or interhospital transfer of patients to the critical care unit
- Maintenance of continuing professional development in accordance with the criteria specified by the JFICMI, the College of Anaesthesiologists of Ireland and the Medical Council
- Liaising with and regular communication with patients, their families and next of kin
- Supervising the intra- and interhospital transport of critically ill patients
- Supervising and contributing to the training of NCHDs and medical students in the critical care unit (including the delivery of regular feedback and supporting workplace-based assessment practices)
- Supporting education, mentoring, research and quality/audit activities within the unit
- Optimising the allocation of critical care resources based on hospital/unit access guidelines
- Contributing to administrative and management activities, according to the needs of the critical care unit and in conjunction with hospital administrative, executive and operational staff
- Targeting, measuring and auditing quality initiatives and key performance indicator goals
- Advising hospital management and other bodies outside the hospital (e.g. professional and regulatory bodies) on clinical and other matters relating to critical care and on planning priorities.

6.1.3 Consultant work practices

The consultant-to-patient ratio should be a minimum one consultant to twelve critical care patients during daytime hours. A minimum of one consultant to thirty critical care patients must be provided during out-of-hours periods and they should be supported by appropriate NCHDs.

Although rosters may vary depending on unit size, number of consultants, number and seniority of NCHDs and on shift duration, the critical care consultant roster should be designed to optimise continuity of patient care. Consecutive days working in the critical care unit (ideally 3-5days) is preferable to individual dayshifts. There should be twice daily ward rounds in all ICUs conducted by the critical care consultants and the rostered NCHDs. Ideally, a consultant roster should not exceed a 1:7 on-call ratio.

At least one consultant should be rostered to the critical care unit at all times, predominantly present in the unit during normal working hours, and at all times available by phone and able to attend the Unit urgently if and when required. In large critical care units, it may be appropriate to have a separate consultant available during daytime hours to review and manage new referrals to the critical care service.

6.1.4 NCHD rostering

- There should be one NCHD rostered in the critical care unit for each six to eight inpatients, though this will depend on local case-mix as well as on the severity of illness and complexity of the patients

- Out-of-hours staffing of the Critical Care Unit should be provided, at a minimum, by an experienced non-consultant hospital doctor appointed to the critical care team

- The ratio of NCHD to patients out-of-hours should be determined by local case mix and activity, but should not exceed one NCHD to every twelve patients

- Critical care NCHDs on-call for the unit should not have any concurrent clinical responsibilities and on-call accommodation should be provided in, or appropriately close to the unit

- The maximum frequency of on-call for NCHDs should be 1 in 6 and each tier of ICU on-call should be staffed by a minimum of 8 doctors

- When designing rosters, due consideration should be given to geographic locations of critical care units (level 3s, 3 or 2) within the hospital campus (proximity to each other if more than 1 unit on a campus), compliance with European Working Time Directives, the additional workload of outreach duties and out-of-hours acute

referrals. The latter is particularly crucial in level 3s units that provide for national services. The responsibility lies with the health care institution to adhere to these recommendations and provide for requisite number of posts to achieve these staffing ratios

- A separate tier of NCHD staffing will be required where clinical commitments exist outside of the critical care unit for considerable periods of time; for example, for outreach services, MICAS transfers, assessing acute referrals to the critical care service.

6.2 Nursing staff

6.2.1. Nursing Standards for Adult Critical Care

The World Federation of critical care nurses (WFCCN 2020 [16]) describes critical care nursing as:
'specialised nursing care of critically ill patients who have manifest or potential disturbances of vital organ functions. Critical care nursing means assisting, supporting and restoring the patient towards health, or easing the patient's pain and preparing them for a dignified death'. Critical care nurses are trained, skilled healthcare professionals functioning at a high level in the critical care unit.

In 2014, critical care quality requirements for nursing were developed to ensure delivery of effective care by senior critical care nursing representatives through the Office of Nursing & Midwifery Services Director and the National Clinical Programme for Critical Care. These can be accessed in full through the Model of Care for Adult Critical Care, Right Care, Right Now, 2014 [12]. These standards were further endorsed within the Critical Care Nursing Workforce Report, 2021 (23)

These requirements should be applied to Level 2, 3 and 3s units.

A summary of the critical care nursing requirements are:

- A minimum of 70% of staff should hold a specialist qualification in intensive care nursing, with skills and competencies pertaining to the clinical specialty of the unit

- Completion of a Postgraduate Diploma in Critical Care Nursing or its historical equivalent (nationally or internationally), is the standard specialist qualification (23)

- All staff should have access to competency-based education and training programmes from foundation level through to postgraduate and Masters degree level in intensive care nursing. The content of these courses should be reviewed on a regular basis in conjunction with the affiliated academic partner to ensure they

meet clinical practicum requirements

- Patients requiring level 2 critical care management require a minimum of one nurse to two patients

- Patients requiring level 3 or level 3s critical care management require a minimum of one nurse to one patient

- A designated clinical nurse manager (CNM 3) with a specialist qualification in intensive care nursing, as well as relevant skills and competencies pertaining to the clinical specialty of the area, is required on site to manage the unit. This person is formally recognised as the overall unit nurse manager.

- ACCESS nurses are in addition to bedside critical care nurses, unit managers, team leaders, clinical facilitators and non-nursing support staff. An ACCESS nurse provides 'on the floor' **A**ssistance, **C**o-ordination, **C**ontingency, **E**ducation, **S**upervision and **S**upport. The ratio of ACCESS nurses is based on qualifications of current nursing staff:

    - < 50% WTE qualified staff = 1 ACCESS nurse per 4 beds
    - 50-75% WTE qualified staff = 1 ACCESS nurse per 6 beds
    - 75% WTE qualified staff = 1 ACCESS nurse per 8 beds
    - For single room Level 3 units a ratio of 1 ACCESS nurse for every 4 single rooms is recommended

- Due to the heterogeneous infrastructure and bed capacity of Critical Care Units, local discussion to consider roles & responsibilities from a Shift Lead perspective is advised.
    - Every shift must have a designated team leader-per 8-10 beds, likely to be a Clinical Nurse Manager (CNM 2), with specialist qualification in intensive care plus knowledge, skills and if Level 3s, competencies in the speciality of the unit,. This nurse should be supernumerary for the entire shift. The primary role of the team leader is to oversee the clinical nursing management of patients, service provision and resource utilisation during a shift (Model of Care 2014)
- Each unit should have a dedicated clinical facilitator/nurse educator. The recommended ratio is 1 WTE:50 staff in Level 3 or Level 3s units. Additional educators/co-ordinators are required to run and manage tertiary based critical care nursing courses.

- Designated ICU audit coordinators are required. One whole-time equivalent (WTE) ICU audit coordinator is needed for every 10 Unit beds audited (Irish National ICU Audit Annual Report 2021).

The following factors should be taken into account when assessing appropriate staffing levels for each unit:

- patient throughput, case mix and dependency
- geographical layout of the unit
- nursing staff skill mix, competence and experience
- specialty services provided
- education and training requirements

National Critical Care Nurse Workforce Planning through the National Clinical Programme in Critical Care is continuously taking place. A critical care nurse career pathway has been developed and endorsed by the Minister for Health in 2017. To fully enable accessibility onto this career pathway, the above requirements should be adhered to in order to establish an appropriate number of qualified critical care nurses within each unit and to allow further development of advanced practice roles within critical care nursing.

6.2.2 Critical Care/Outreach Advanced Nurse Practitioners

Advanced Nurse Practitioners/Outreach services linked to Critical Care have been shown to impact on patient experience and outcome. Recommendations for these posts were made in the Irish National Early Warning System (INEWS) Version 2 (Page 43, INEWS V2, 2020) & the Irish National Intensive Care Unit Audit report for 2018 (Page 126, INICUA 2020).

ICUs should explore the possibility of delivering a 24/7/365 ANP service.

6.3 Patient and Client Support Services

6.3.1 Health care assistants

Further review of nursing practices will serve additionally to facilitate development of Health Care Assistants with specific competencies pertinent to critical care.

Minimal standards relating to health care assistants in critical care include:

- A training program for health care assistants delivered to FETAC Level 5 Health Care Support Certification, must include a specific module for critical care
- Target numbers for health care assistants who will complete the FETAC module should be determined and reviewed regularly
- Resources should be allocated to support time and costs associated with maintenance of professional competencies, continuous professional development and quality assurance activities
- One Health Care Assistant with specific competencies per 6 beds per shift in an open-plan unit

6.3.2 Chaplain/Pastoral care

The majority of critical care admissions should progress to survival and hospital discharge. Where survival is not possible despite optimal care, it is equally important to ensure best care of the dying patient with a focus on dignity, respect, and comfort. All critical care units should aim to also provide for patients' families and friends/loved ones in these circumstances, with provision of as much privacy as is possible within a busy critical care environment and making available private interview and family rooms. It is therefore expected that all critical care units would have 24hr access to pastoral care service according to patient needs.

6.3.3 Other Assistant grade staff

Depending on the casemix of patients and the services provided in the critical care unit, there may be a requirement for additional assistant grade staff. These would include physiotherapy assistants, speech and language therapy assistants, pharmaceutical assistants, occupational therapy assistants or radiography assistants.

6.4 Support Staff

- Sufficient non-clinical support staff must be provided to carry out non- clinical support duties. These would include general administration, secretarial support (1:12 secretarial to patient ratio), research, domestic duties, housekeeping and portering

- Support staff are required to ensure robust data collection and audit as specified by the INICUA.

- Appropriate critical care specific training for non-clinical support staff is required

6.5 Health and Social Care Professionals

Critically ill patients and the critical care service requires the attendance of specific health and social care professionals as outlined in the report; 'HSCP and Pharmacy in critical care, a workforce survey of the Irish public system' (HSE 2024).

6.5.1 Physiotherapy

Specialist physiotherapy is required for the majority of critically ill patients. The Model of Care (MOC) for Adult Critical Care guidelines (2014) recommend that critical care units provide a physiotherapy service 24/7/365. Where possible, staff should be dedicated to the critical care unit. Physiotherapy staffing should be sufficient to provide both respiratory management and the rehabilitation components of care. The critical care physiotherapy team should be led by a clinical specialist or an experienced senior. The recommended staffing ratio is 0.2WTE/critical care bed (0.24WTE/bed including 20% headroom) (see table 1).

6.5.2 Clinical Nutrition/Dietetics

Critical care units should provide a dietetics service at least 5 days per week with a consideration to increasing to 7 days per week, in particular in large units and in level 4 hospitals. The critical care dietetics team should be led by a clinical specialist or an experienced senior. The MOC (2014) recommends a staffing ratio of 0.06WTE/level 2 critical care bed or 0.12WTE/level 3 bed (see table 1). Critical care units are encouraged to target 0.12WTE per level 2 and level 3 bed, allowing for the expansion in dietetics duties, including indirect calorimetry, body composition measurement/estimation and more detailed documentation.

6.5.3 Pharmacy

The complexity of prescribing, administration and associated costs requires that a specialist pharmacist should be available to the critical care unit on a 7 days per week basis. The critical care pharmacy team should be led by an experienced senior pharmacist. The MOC (2014) recommends a staffing ratio of 0.05WTE per level 2 critical care bed and 0.1WTE per level 3 bed (0.06WTE/level 2 bed and 0.12WTE/level 3 bed including 20% headroom) (see table 1).

6.5.4 Speech and Language Therapy

Critical care units should provide a speech and language therapy service 5 days per week with a consideration to increasing to 7 days per week, in particular in large units and in level 4 hospitals. The critical care speech and language therapy team should be led by a dedicated clinical specialist or an experienced senior. As per the RCSLT Position paper (2019), funding should be made available for the routine use of instrumental assessment such as FEES (flexible endoscopic evaluation of swallowing) and for the training of staff in this specialist skill. The MOC (2014) recommends a staffing ratio of 0.06WTE/critical care bed (0.07WTE/bed including 20% headroom) (see table 1). Consideration should be given to increasing this recommendation to 0.1WTE per critical care bed in line with UK guidelines for the provision of intensive care services 2022.

6.5.5 Occupational Therapy

Critical care units should provide an occupational therapy service 5 days per week with a consideration to increasing to 7 days per week, in particular in large units and in level 4 hospitals. Staff should be dedicated to the critical care unit where possible. Where an Occupational Therapy service to critical care is not well established, additional staffing will be required to develop the service. Since the MOC (2014) staffing recommendations were developed, the role and scope of the critical care occupational therapist has expanded and is now considered an essential component of the multidisciplinary team. The MOC (2014) recommends a staffing ratio of 0.12WTE/critical care bed (complex medical) – 0.14WTE/bed (pulmonary/ventilation) (0.14 - 0.17WTE/bed including 20% headroom) depending on complexity of patients in the unit (see table 1).

6.5.6 Medical Social work

Critical care units should have access to a Medical Social Work service 5 days per week. Staff should be dedicated to the critical care unit where possible. The critical care medical social work team should be led by a senior medical social worker/team lead, with support from an experienced senior social work practitioner. The MOC (2014) guidelines do not provide a staffing ratio recommendation for medical social work in critical care. Expert consensus from the HSCP critical care advisory group support a recommendation for 0.1WTE/critical care bed (0.12WTE/bed including 20%

headroom) (see table1).

6.5.7 Clinical Engineering

Every critical care unit requires the support of the hospital clinical engineering department. There should be a dedicated critical care clinical engineering service, 24/7, immediately available during working hours, available on-call during out-of-hours, staffed by personnel with the specific knowledge and skills to support the complexity of such critical care services. The critical care clinical engineering team should be led by a Principal grade in Level 4 hospitals due to the complex nature of patients therein. Senior grade with critical care experience should be considered a minimum in level 3 hospitals. The MOC (2014) does not provide a staffing ratio recommendation for clinical engineering in critical care. Expert consensus from the HSCP critical care advisory group recommends a staffing ratio of 0.06WTE/critical care bed (0.7WTE/bed including 20% headroom) (see table 1).

6.5.8 Clinical Measurement

HSCPs working in clinical measurement physiology include cardiac physiologists, vascular physiologists, respiratory physiologists, neuro-physiologists and GI physiologists. While echocardiography competency is becoming a standard feature of intensive care training, some critical care units still depend on cardiology departments for diagnostic echocardiography. In these units, consideration should be given to having a dedicated cardiac physiologist service. Expert consensus from the HSCP critical care advisory group recommends a staffing ratio of 1.0WTE cardiac physiologist per critical care unit in level 4 hospitals to support daily input for diagnostics and the provision of daily training particularly related to ECHO.

6.5.9 Clinical/Counselling Psychology

Given the well-established burden of psychological morbidity among critically ill patients and their families, access to specialist psychological support is now recognised as a key element of international best practice service delivery during an admission to critical care, as well as at discharge. The Guidance and Service Specification for Integrated Practitioner Psychologists in Intensive Care Units by the Intensive Care Society (UK), recommends that a minimum of band 8b psychologist (HSE equivalent; Senior) is employed for small to medium units defined as ≤20 beds, with a band 8c consultant clinical / Counselling psychologist (HSE equivalent; Principal Specialist) being employed for larger units defined as > 20 beds (ICS-UK 2022). It is recommended that practitioner Psychologists be dedicated to, and embedded within, the critical care team, providing a service 5 days per week. Recent benchmarking from the UK recommends a ratio of 0.06 WTE/level 3 critical care bed (0.07WTE/bed including 20%

headroom) (ICS-UK, 2022) (see table 1).

6.5.10 Radiography

Critical care units should provide a 24/7/365 radiography service. The critical care radiography team should be led by a clinical specialist and include a range of experience from senior to staff grade staff to ensure skill mix and provision of training in complex patient presentation. The MOC (2014) does not provide a staffing ratio recommendation for radiography in critical care. Expert consensus from the HSCP critical care advisory group recommend a staffing ratio of 0.2 WTE/critical care bed (0.24WTE/critical care bed including 20% headroom) and this is supported by the Irish Institute or Radiography and Radiation therapy (IIRRT) guidelines. (see table 1).

6.5.11 Laboratory Medicine/Clinical Scientists

HSCPs working in laboratory medicine includes medical scientists, clinical scientists and biochemists. While there is no specific workforce guidance for laboratory medicine in critical care in the literature, there is evidence that additional beds require additional resources, particularly in microbiology, as many patients have complex infections with multi-resistant organisms. Where critical care units are due to expand, the HSCP critical care advisory group recommend that an additional 1.0WTE/unit or 0.06WTE/bed should be considered.

PROFESSION	GRADE / SKILL MIX	WTE	WTE + 20% headroom
CLINICAL MEASUREMENT PHYSIOLOGIST	Chief cardiac physiologist	1.0/unit Level 4 hospital	1.0/unit Level 4 hospital
CLINICAL ENGINEER	Principal (level 4 hospital) Senior (Level 3 hospital)	0.06/bed	0.07/bed
CLINICAL/ COUNSELLING PSYCHOLOGIST	Senior for ≤20 bed unit if service established Principal Specialist for ≤20 unit if service not established Principal Specialist for >20 bed unit	0.06/bed *Includes staff support, patient rehab, family support & step-down work. Additional required to support service development if not already established*	0.07/bed
CLINICAL NUTRITIONIST/	Clinical Specialist or experienced senior	0.12/Level 3 bed	No change

DIETITIAN			
MEDICAL SOCIAL WORKER	Senior MSW/Team Lead with support from Senior Practitioner	0.1/bed	0.12/bed
OCCUPATIONAL THERAPIST	Clinical Specialist or experienced senior	0.12-0.14/bed depending on complexity	0.14-0.17/bed
PHARMACIST	Senior grade or higher	0.05/level 2 bed 0.1/level 3 bed	0.06/level 2 bed 0.12/level 3 bed
PHYSIOTHERAPIST	Clinical Specialist to lead a team consisting of a grade mix depending on complexity; staff grade, Senior	0.2/bed	0.24/bed
RADIOGRAPHER	Clinical Specialist to lead a team consisting of a grade mix depending on complexity; staff grade, Senior	0.2/bed	0.24/bed
SPEECH AND LANGUAGE THERAPIST	Clinical Specialist or experienced senior	0.06-0.1/bed	0.07-0.12/bed

Table 1: Summary of recommendations for HSCP & Pharmacy in Critical Care (for additional information, see text)

7. Conclusion

Critical Care is an expensive and finite resource for the care of critically ill patients with an underlying reversible component to acute or chronic disease.

Ensuring best outcomes includes appropriate benchmarking and all units should be included in the INICU Audit process which provides for an internal audit and national and international case-mix adjusted bench-marking system.

These guidelines act to advise regarding best current international practice and have been informed by similar standards and guidelines as referenced below.

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9. Abbreviations

ADON	Assistant director of nursing
CCAG	Critical Care Advisory Group
CICM	College of Intensive Care Medicine (Australia)
CNM	Clinical nurse manager
ECHO	Echocardiogram
ECLS	Extracorporeal life support
ECMO	Extracorporeal membrane oxygenation
EHR	Electronic health record
ESICM	European Society of Intensive Care Medicine
FEES	Flexible endoscopic evaluation of swallowing
FETAC	Further Education and Training Awards Council
HBN	Health building note
HCA	Health care assistant
HDU	High-dependency unit
HSCP	Health and social care professional
ICS-UK	Intensive Care Society – United Kingdom
ICSI	Intensive Care Society of Ireland
ICU	Intensive care unit
IIRRT	Irish Institute of Radiography and Radiation Therapy
IMS	Information management systems
INICUA	Irish National ICU Audit
JFICMI	Joint Faculty of Intensive Care Medicine
MICAS	Mobile intensive care ambulance service
MOC	Model of care
NCHD	Non-consultant hospital doctor
NIV	Non-invasive ventilation
NOCA	National Office of Clinical Audit
ODNM	Organ donation nurse manager
PACU	Post-anaesthesia care unit
SARI	Strategy for the control of antimicrobial resistance in Ireland
SCCM	Society of Intensive Care Medicine (USA)
WFCCN	World Federation of Critical Care Nurses
WOW	Workstation on wheels
WTE	Whole time equivalent