The Faculty of Intensive Care Medicine

Intensive Care Society

GUIDELINES FOR THE PROVISION OF INTENSIVE CARE SERVICES

Version 3
January 2026

Review date

Ususally within three years, or sooner if important information becomes available.

Feedback

If you would like to provide feedback on these guidelines, please email contact@ficm.ac.uk or guidelines@ics.ac.uk

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Contents

Introduction

On behalf of the Faculty of Intensive Care Medicine (FICM) and the Intensive Care Society (ICS), welcome to the third edition of Guidelines for the Provision of Intensive Care Services (GPICS).

The first edition of GPICS (2015) was a landmark publication, building on the earlier Core Standards for Intensive Care Units (2013). GPICS V2 (2019) strengthened this foundation, while GPICS V2.1 (2022) was written to incorporate immediate learning from the SARS-CoV-2 pandemic.

Over the last decade GPICS has become the definitive reference source for the planning, commissioning and delivery of adult intensive care services in the UK.

Many ICUs have found the standards and recommendations within GPICS invaluable in developing successful business cases to enhance their local services and improve patient care. GPICS continues to be used as the benchmark by which local services are peer reviewed and assessed by healthcare regulators, such as the Care Quality Commission (CQC). In Scotland, GPICS informs the intensive care quality indicators used by the Scottish Intensive Care Society Audit Group (SICSAG).

For the purposes of GPICS V3, intensive care is defined as Level 3 and Level 2 care (see Levels of Care for more information). While GPICS V3 does include a chapter on Level 1 - enhanced care, the emphasis is on how enhanced care should interface with intensive care services.

Like previous versions of GPICS, GPICS V3 is not a clinical guideline. It is concerned with service provision**.** In each chapter, standards and recommendations are written to address broad themes only, such as infrastructure, people and high-level processes.

One of the challenges with producing a document such as GPICS can be the lack of a hard evidence base for some of the standards and recommendations that may be, by necessity, based on professional opinion and established practice. It is therefore essential that standards and recommendations are subject to regular review and revision, as new evidence becomes available and practice changes.

Terminology

There has been important revision and clarification of terminology in GPICS V3.

Standards are now defined as minimum standards. A minimum standard is something we expect all ICUs to meet, or to record on a risk register if unmet. Minimum standards serve as essential safety markers. They are 'must do' statements. Minimum standards can be viewed as an assurance to patients, the public and clinicians that performance against these standards is being monitored and achieved. The chapter authors and Editorial Board have worked carefully to ensure all minimum standards are realistic, important and deliverable.

Recommendations are now defined as recommendations to provide a quality service. While we have no doubt they will still often be referred to simply as 'recommendations', this shorthand belies the shift in approach. Our vision is that minimum standards and recommendations to provide a quality service are better aligned with other regulatory and non-regulatory frameworks of the health services of the UK (see Table 1). Recommendations to provide a quality service act as quality markers. They are hallmarks of what a high-quality intensive care service should look like. Good ICUs, forward-thinking ICUs, will achieve many of them. Over time, we anticipate that most ICUs will meet all the recommendations to provide a quality service that are relevant to their patient population. This will ensure equitable and high-quality care for critically ill patients across the UK.

The recommendations to provide a quality service are therefore 'should do' statements, i.e., desirable, but not mandatory, markers of quality care. As such they can be used to drive improvement. Meeting the recommendations is evidence that the intensive care service is providing a quality service. Quality indicators are often aspirational and sometimes challenging to achieve, as they may involve action across the whole hospital, healthcare organisation or even wider systems. Nevertheless, it is the intention of the FICM and ICS that these recommendations to provide a quality service should reflect routine practice within UK ICUs.

Table 1. GPICS V3 terminology alignment with other regulatory and non-regulatory frameworks

GPICS 3 Terminology	Scottish Intensive Care Society	Care Quality Commission rating	Healthcare Improvement Scotland
Minimum Standards	Minimum Standard	*If not meeting minimum standards* Inadequate Requires Improvement	*If not meeting minimum standard* Requirements
Recommendations to Provide a Quality Service	Quality Indicator	*If meeting recommendations* Good Outstanding	*If meeting quality indicator* Good

Notes

- Our Editorial Board representatives from Wales and Northern Ireland note that less explicit frameworks are applicable in their nations.
- It is possible that, during the lifespan of GPICS V3, the other frameworks listed in Table 1 undergo changes in terminology. However, this does not alter the plain reading of the GPICS V3 terminology against these other frameworks. "Good" is still good", even if the term is not used in a formal regulatory context.

Background is now defined as background and explanation**.** In GPICS V3, only one sentence, and only one 'must' or 'should' respectively, is allowed in each minimum standard and recommendation to provide a quality service. This stylistic decision was made to aid auditability and readability. However, more information is sometimes required to interpret a given standard or recommendation. To that end, the background and explanation section contains not only background information and additional explanation as the heading suggests but also examples and extrapolations, that can help interpret a standard or recommendation. This makes the background and explanation section important to read alongside the standards and recommendations.

Unless already formalised as a name, critical care is referred to as intensive care throughout GPICS V3. There is an ongoing broader discussion in the specialty, professional community and services about which term better reflects the care we deliver in the UK. The decision of the GPICS V3 Editorial Board was more limited. This document is titled Guidelines for the Provision of Intensive Care Services. It is produced by the Faculty of Intensive Care Medicine and the Intensive Care Society. Key Editorial Board members and stakeholders include representatives from the Scottish Intensive Care Society, Welsh Intensive Care Society and the Northern Ireland Intensive Care Society. There are, of course, board members and stakeholders from the British Association of Critical Care Nurses, and other critical care organisations, and no reduction in importance is intended. However, for consistency, and with a view to the future of a College of Intensive Care Medicine, 'intensive care' is the preferred terminology used in GPICS V3.

GPICS V3 is more aware of its four-nation responsibility than any previous version. For example, you will not find the use of the term 'trust' without mention of 'health board' unless referring specifically to England or Northern Ireland.

In GPICS V3, like many healthcare documents, the term multidisciplinary team (MDT) is used. As is widely acknowledged, there is no one satisfactory definition for MDT. Unless specified in an individual chapter, the broadest interpretation is intended: individuals from different disciplines or professions working together for a shared purpose.

There has been much discussion about 'advanced airway skills' and the lack of consensus definition. In GPICS V3 we regard it as a minimum standard that all medical doctors and ACCPs on the on-site rota must have basic airway skills and that all ICUs must have immediate access to staff with a minimum standardised airway skill set. For the purposes of GPICS V3 this would be regarded as:

- An Anaesthetist in Training who has had their Initial Assessment of Competencies (IAC) signed off.
- An Intensivist in Training who has had IAC signoff or the equivalent of the IAC.
- A doctor practising in the ICU who has completed the IAC or equivalent and is deemed competent by their local ICU.
- An ACCP who has successfully completed the Additional Advanced Skills Framework (AASF) and is deemed competent by their local ICU.

In addition, ICUs must have access to staff with advanced airway skills who can help manage difficult or challenging airways.

Other changes

In GPICS V3 we significantly expanded our editorial process, with the introduction of an Editorial Board and the appointment of Section Editors. The Section Editors played a crucial role in assisting the Lead Editors by working closely with chapter authors and ensuring consistency in style across the chapters. The future of intensive care medicine leadership lies with its intensivists in training; their involvement in the Editorial Board and process has been invaluable.

To reflect the importance that both the FICM and ICS place on equality, diversity and inclusion, we appointed a specific EDI Lead whose remit was to ensure GPICS V3 meets the needs of all those working in and using intensive care services. GPICS V3 has achieved greater diversity of authorship than any previous edition.

For the first time, GPICS V3 includes a chapter on sustainability. We acknowledge the significant role that healthcare, and specifically intensive care, can play in making small changes that contribute to addressing the climate emergency we all face.

For the first time, patient and lay representatives have been involved in the editorial process, and their involvement has been fundamental in encouraging us to be bold in our changes. Their insights have helped ensure GPICS V3 reflects the needs of both patients (and their families) and staff providing intensive care services.

To the chapter authors, both in this version of GPICS and all the preceding versions: you gave your time and expertise voluntarily. GPICS V3 could not have been written without you.

Finally, to all of you who work and care for patients in any capacity within the UK's intensive care services: thank you. You are part of a team that delivers a standard of care any of us would wish for ourselves or our families.

It is a privilege to work beside you. It is a privilege to work in intensive care.

Dr Dale Gardiner

Faculty of Intensive Care Medicine

Lead Editor for GPICS V3

Dr Paul Dean

Intensive Care Society

Lead Editor for GPICS V3

Endorsing Organisations

The Faculty of Intensive Care Medicine	FICM
Intensive Care Society	ICS
Association for Cardiothoracic Anaesthesia and Critical Care	ACTACC
Association of Chartered Physiotherapists in Respiratory Care	ACPRC
British Association of Critical Care Nurses	BACCN
British Dietetic Association	BDA
Critical Care National Network Nurse Leads Forum	CC3N
Chartered Society of Physiotherapists	CSP
ICUsteps	ICUsteps
Neuro Anaesthesia and Critical Care Society	NACCS
National Outreach Forum	NoRF
National Strategic Clinical Network for Critical Care, Emergency Medicine and Trauma (Wales)	CCTEM
Royal College of Anaesthetists	RCoA
Royal College of Nursing	RCN
Royal College of Occupational Therapists	RCOT
Royal College of Speech and Language Therapists	RCSLT
Society of Critical Care Technologists	SCCT
Scottish Intensive Care Society	SICS
UK Critical Care Nursing Alliance	UKCCNA
UK Clinical Pharmacy Association	UKCPA
Welsh Intensive Care Society	WICS

SUPPORTING ORGANISATIONS

Royal Pharmaceutical Society	RPS

Section 1

Structure

1.1 Scope of Adult Intensive Care

Authors: Daniele Bryden & Steve Mathieu

INTRODUCTION

Intensive care services provide care, monitoring, and therapeutic interventions to patients with life-threatening conditions or injuries and complex multi-organ dysfunction in and beyond the physical walls of an intensive care facility. Intensive care services underpin the safe and effective working of hospital services. High staffing levels, trained staff and closed organisational models are associated with improved patient outcomes[1].

Intensive care facilities incorporate both intensive and high dependency care in stand-alone or combined units and can be for adults or children. Care needs are defined within the Intensive Care Society Levels of Care Consensus statement[2]. Intensive care services can be dedicated to one specialty/organ e.g. cardiac, liver or neurosurgery/ neurology or provide for a general patient population. Increasingly all ICUs provided in a hospital are integrated under the leadership of a single intensive care service regardless of whether they are based at one location or in separate geographical areas within the hospital.

MINIMUM STANDARDS

1. Intensive care services must be managerially led by a designated clinical director or lead consultant, a lead nurse or matron, and with dedicated operational support from a general manager or service manager.
2. Where the clinical director for the service is not a consultant in ICM, the clinical lead for intensive care must be a consultant in ICM.
3. Intensive care services must have access to a consultant in ICM available 24/7. (see Chapter 2.1 Consultant Staffing)
4. A consultant/specialist must be responsible for clinical decision-making, admission and discharge on the ICU. (see Chapter 2.1 Consultant Staffing)
5. Intensive care services must have an effective clinical governance structure and robust data collection with participation in national audit programmes for adult intensive care.
6. Intensive care services must declare occupancy, physical and staffed capacity and unit stress data through their relevant networks or reporting structures.
7. Hospital trusts, health boards and adult critical care clinical networks (ACC networks) must regularly monitor intensive care provision for signs of potential intensive care stress as indicated by the metrics of delayed admissions, overnight discharges, admissions with four or more organ failures, readmissions and capacity transfers.
8. Intensive care services must ensure that there are robust surge plans in place which align to published guidance where it exists to ensure services are responsive to changes in demand.

Intensive care discharges must be discussed pre-emptively at hospital-wide daily bed management meetings and given the same level of priority as hospital admissions[3].

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

1. Guidelines for the Provision of Intensive Care Services should be the blueprint for safe and effective services[4,5].
2. Intensive care healthcare professionals should be consulted when acute hospital services are being reconfigured.
3. Enhanced care services should be developed to provide flexible patient care, including provision of non-invasive ventilation, improve patient flow in elective services, support operative scheduling and release capacity within intensive care[6].
4. Provision for the rehabilitation and follow-up of intensive care patients should be built into all service models of intensive care delivery[7,8].
5. Individuals appointed to a consultant post should be on the GMC specialist register for ICM.
6. Intensive care services should have a workforce strategy and delivery plan in place which includes multidisciplinary workforce development[9], support for staff health and wellbeing and implementation of new models of working.
7. Research and quality improvement (QI) should be an integral part of the work of the intensive care service evidenced through involvement in NIHR portfolio studies and national benchmarking data sets and QI programmes.
8. At intensive care discharge, plans for future treatment should be documented along with patients' wishes, values and preferences (if known) and included in discharge summaries to GPs[10].

9. Full 24/7 intensive care outreach services should be provided by team members with intensive care training in every hospital with an ICU.

BACKGROUND AND EXPLANATION

A dedicated intensive care physician-led multidisciplinary team that provides collaborative high-quality intensive care and the use of evidence-based treatment and protocols are key elements for provision of high-quality intensive care to seriously ill patients. The intensive care team also has a role in end-of-life care, patient safety, ethics and family support.

There is good evidence that intensivist-led patient management is associated with better patient outcomes than are achieved in units without intensivist cover. In addition, an intensive care team led by an intensivist in a closed-format unit provides quality care more efficiently ensuring that patients and their families receive appropriate, coordinated management and consistent communication. Where an individual has been appointed into a consultant in ICM post who is not on the GMC specialist register for ICM, mitigations will be needed to support the new appointee as outlined by the Faculty of Intensive Care Medicine[9]. Intensive care service workforce strategies need to consider multidisciplinary workforce development[10], support for staff health and wellbeing and implementation of new models of working e.g. development of the Advanced Critical Care Practitioner (ACCP) role[11].

Intensive care survival, particularly when associated with emergency and prolonged admission (>48-72 hours), carries significant physical and psychological burdens impacting on future quality of life: 24% of intensive care survivors are re-admitted to hospital within 90-days of discharge from hospital[12]. Advance care planning and shared decision-making protocols allow healthcare teams to know patient and families' wishes and help to inform appropriate referrals to intensive care.

Capacity and patient flow through the service is key to safe and efficient management of patients requiring intensive care and access to adult intensive care services may be impacted during episodes of unexpected increased demand. Pre-emptive discussion of intensive care discharges ensures optimal patient flow and allows for new intensive care patients to be admitted in a timely manner.

The core principles of the NHS are for equitable access, standards of care and timely admission to intensive care. Every effort should be made to facilitate the discharge of ward ready patients from critical care to optimise bed capacity and staffing standards.

Intensive care is funded through a combination of specialised and local commissioning models based broadly on numbers of organs supported. This funding model can lead to inequitable provision of service for patients. High quality intensive care services ensure consistency of intensive care service provision for all admitted patients and have a demonstrable culture of continual quality improvement underpinned by robust data collection and audit e.g. the Intensive Care National Audit and Research Centre (ICNARC) Case Mix Programme, Scottish Intensive Care Society Audit Group (SICSAG).

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1.2 Intensive Care Outcomes

Authors: Nazir Lone, Joanne McPeake & Dan Harvey

INTRODUCTION

ICUs admit older patients with increasing multimorbidity, many of whom have high-predicted short- and medium-term mortalities with or without these therapies. Such admissions are frequently undertaken in the pursuit of patient-centred outcomes other than mortality; for example, reduction in pain or other distressing symptoms caused by surgical intervention, or admission to intensive care for a period of evaluation[1], in which both the scope and duration of therapies are limited, not to restrict their benefits, but to reduce their harm. In such circumstances, the success of medical endeavour is not the prevention of death at any cost, but the provision of care in which burdens and benefits are balanced for the individual[2]. An exclusive focus on mortality outcomes will teach us little of the value of such admissions[3]. It may be important to differentiate between intensive care outcome metrics designed specifically to guide such decision making, from those designed to facilitate research, benchmarking, peer review and quality assurance.

MINIMUM STANDARDS

1. ICUs must hold multidisciplinary clinical governance meetings, including analysis of mortality and morbidity.
2. ICUs must participate in a national audit programme for adult intensive care.
3. ICUs must participate in a mortality review programme using appropriate methodology to maximise learning and improvements in care[4,5].
4. ICUs must participate in a programme of healthcare associated infection surveillance to monitor and benchmark infection rates.

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

1. ICUs should develop a consistent approach to patient-centred decision making, evaluating burdens and benefits of admission to intensive care, and be able to demonstrate this through the audit of pre-admission consultation, agreed ceilings of therapy, and time-limited treatment trials.
2. ICUs should develop and subsequently support implementation of a validated methodology to review referrals to intensive care which can evaluate decision making and subsequent outcomes relating to intensive care admission.
3. Longer-term mortality up to one year after ICU admission should be reported on all patients admitted to intensive care.
4. Validated measures of longer-term patient- and family-centred outcomes beyond mortality, including measures of functional ability, mental health, socioeconomic consequences, and carer burden, should be included in local and national audit programs.
5. ICUs should develop and subsequently support implementation of validated measures of quality of care relating to decision making, end of life care and bereavement.
6. ICUs should consider systematic assessment of patient and family experiences and demonstrate how these are used to guide improvement.

BACKGROUND AND EXPLANATION

Mortality rates in intensive care have been falling for two decades. However, one in five patients admitted to ICUs dies during their hospital admission. Benchmarking of mortality through the reporting risk-adjusted acute hospital mortality remains an important focus for outcome measurement. The link between risk-adjusted mortality and quality of care, however, remains elusive[6]. Furthermore, patients referred to, but not admitted to intensive care, are not currently captured in ICU databases and variation in admission practices between units may impact the risk-adjusted mortality.

In contrast to risk-adjusted mortality measurement, process of care measures, patient experience, research activity, and long-term outcomes provide information which can be directly incorporated to improve practice, which is therefore empowering to the staff. Crucially, the development and reporting of validated and reliable functional outcome metrics after intensive care will facilitate patient-centred, individualised decision making by patients, families and clinicians[7]. This will be of critical value for an increasingly ageing and multimorbid population[8]. Such outcomes may indeed lead to the prioritisation of interventions which maximise maintaining functional independence, even at the expense of mortality, reflecting preferred treatment goals for many older patients with multiple long-term conditions[9].

Process of care measures include audits of the reliability of delivery of best practice (for example, lung-protective ventilation, adherence to sedation policies, consistency of weaning plans) and adverse event monitoring (ICU-acquired infection rates, unplanned extubation, and out of hours discharge from the ICU). Established national audits, such as the Intensive Care National Audit and Research Centre Case Mix Programme and the Scottish Intensive Care Society Audit Group, play a central role in benchmarking quality of care across a range of process measures and outcomes.

Experiential measures include patient and family satisfaction surveys, which provide an important opportunity for organisational reflective learning and important insights into the quality of care in intensive care units. Setting up and maintaining satisfaction surveys require investment in staff resources and tools for survey distribution, collation and analysis[10]. They may usefully be supplemented by staff and medical trainee surveys. Feedback of results and monitoring of actions taken require ownership by senior members of staff and a regular forum for dissemination. Combining this with the establishment of a patient and family group for the ICU provides an important vehicle for constructive change.

Research and audit activity are important indicators of an aspirational and learning environment. Engagement in research generally improves healthcare performance[11]. Participation in a research group is associated with lower burnout rates amongst intensive care nursing staff. The research environment for intensive care has been improved substantially by co-ordinated professional organisations.

In the last decade, a growing body of research has revealed the profound burden that an episode of critical illness can impose on individuals and their family[12,13]. Furthermore, emerging evidence suggests that bereaved relatives of ICU patients may experience long-lasting, high levels of complicated grief, and adverse mental health outcomes, which may be amenable to intervention[14]. Evaluating the post-intensive care period in hospital may provide insights into the quality of intensive care rehabilitation, the timeliness and appropriateness of intensive care discharge, the quality of care on the wards and the quality of end-of-life care provision. Assessing care needs and evaluating outcomes over the longer-term requires a funded infrastructure[15], with delivery models usually centred around an intensive care follow-up clinic, although the ideal model of care delivery remains uncertain[16].

As society ages and the proportion of frail elderly patients presenting with acute illness increases, we will need to develop and report a broader set of outcomes and risk-prediction strategies which will enable informed decision making about the benefits and burdens of intensive care. The focus of intensive care will shift more towards the preservation and restoration of physiological reserve and enabling those who survive to rehabilitate to their maximum potential.

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1.3 Physical Facilities

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INTRODUCTION

Intensive care brings together patients, staff and visitors in one of the most hyperacute, multiprofessional, and emotionally demanding settings in UK healthcare. It is important that the quality and design of the ICU built environment is not seen as merely a technical backdrop but rather as a key component of a clinician-directed, evidence-based treatment pathway. This chapter is a clinical call to arms.

Guiding principles are as follows: all users of an ICU are equally important. Firstly, patients need a safe, humanised environment which delivers timely treatment, seamlessly early access to imaging and necessary interventions, early recovery, and active rehabilitation; all in an environment that maximises orientation, socialisation and healing. Secondly, staff are what makes intensive care, and unit design needs to maximise communication, collaboration, mutual support, health at work and wellbeing. Thirdly, families and visitors deserve equal respect as building users in their own right, and as a major part of the patient experience and recovery process.

This chapter considers the physical facilities for ICUs whether they be Level 2, Level 3 or mixed.

MINIMUM STANDARDS

1. Intensive care facilities must meet all relevant UK healthcare building standards (see background and explanation for further details).[1]
2. Derogations must be approved at trust/health board executive level with documented reasons and resolution plans with an agreed timescale.
3. Adaptation or extension (colloquially, 'refurbishment') projects must be planned and benchmarked against the same standards as new buildings.
4. Where compliance is impossible, adaption or extension projects must demonstrate best intent and closest possible approximation to those standards within the constraints of the site.
5. The physical facilities of an ICU must be reviewed at (as a minimum) five-yearly intervals for continued fitness for purpose.[2]
6. The layout and circulation of clinical spaces must be optimised for independent and collaborative staff working and shared visibility.[3]
7. Clinical, operational and staff areas must comply with national workplace standards and Health and Safety guidance and legislation.[4,5]
8. Unit layout must mitigate the impact of single rooms on patient and staff isolation, including staff safety.
9. There must be sufficient and accessible storage for diagnostic, technical and rehabilitation equipment and consumables.

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

1. In the case of major ICU projects, trusts/health boards should involve clinicians in key decision-making including representative clinical leadership at Project Board level.[6-8]
2. ICUs should be designed with best use of natural and artificial light[9,10], control of noise[11] and concepts of biophilic environments[12] in mind.
3. Requirement for single rooms and isolation rooms should be carefully evaluated against projected case-mix and future staffing impact.
4. Design of clinical spaces should minimise the visual and audible impact of clinical equipment for all users, and provide familiarity, communication and entertainment to maximise cognitive engagement for patients.
5. Facilities for families and visitors should be planned respectfully and to a standard comparable with other high-consequence facilities such as cancer centres or children's hospitals.
6. Flexible spaces for staff, including spaces for retreat, quiet working, and on-duty training and education, should be positioned to maintain immediate clinical availability.
7. Units should have provision for private office spaces for leadership, decision making, counselling and mentoring conversations.
8. ICUs should be designed for maximum resilience and unit safety, considering future infection control and pandemic compartmentalisation requirements, along with fire safety and emergency evacuation features in line with recent Intensive Care Society and Association of Anaesthetists guidelines.[13,14]

BACKGROUND AND EXPLANATION

Scope and purpose

The current UK healthcare building standards are:

- NHS Estates Health Building and Technical Notes (2013-2014)[1]
- HBN 04-02 (critical care)
- HBN 00-01 (general design guidance for healthcare buildings)
- HBN 14-02 (Medicines storage in clinical areas)

An ICU built now will be in service beyond 2050. Physical facilities need to keep pace with evolving clinical practice, and both reflect, and help to shape, a forward-looking multidisciplinary intensive care team, its culture and its ways of working. In addition, developments in other clinical specialties will offer future opportunities to reshape the intensive care pathway: for example, emerging imaging technology such as virtual support tools and intelligent CT scanners will allow less specialised staff to perform scans with remote senior radiography support, addressing workforce challenges and making ICU-based or adjacent scanners more workable. Taking advantage of such developments tomorrow will require vision and forward planning today.

Reviewing units every five years ensures they remain fit for purpose, and this can be undertaken using patient and carer feedback, staff concerns and sickness rates, and instrumental environmental monitoring (such as temperature variation and noise levels), with defects identified and disclosed to local governance pathways, regional peer review, and Care Quality Commission inspections[2].

The challenge to clinicians and design teams is to deliver a flexible and dynamic intensive care design that supports innovation and best-practice care in the face of operational and financial pressures, a changing workforce and technological obsolescence. This is not straightforward but is achievable, and the opportunities to get it right are too great to miss. This is particularly important given that the greatest single sustainability impact of a new ICU is likely to be in its construction, which puts a high environmental price on any lost opportunities or missed benefits.

Statement of need

Among hospital patients, the critically ill occupy the most technology-focussed clinical area: but being bedbound and dependent for often prolonged periods, they are also the most in need of a compassionate, supportive environment that actively drives their recovery. All aspects need to be considered including sensory environment, communication, cognitive stimulus and re-socialisation, physical comfort and, as much as possible, autonomy over immediate environment. Most importantly there is now improved understanding that provision of physical rehabilitation - historically under-recognised in HBN 04-02 and other past guidance - is fundamental to the intensive care patient journey and to long-term outcomes. It is beneficial to have sufficient space and equipment for physical rehabilitation at the bedspace, and consideration of additional accessible spaces for rehabilitation within or co-located within the intensive care footprint.

The importance of addressing NHS staff welfare is now well-recognised[15], and the ICU environment needs to be carefully designed and curated to actively drive open communication, strong teams, safety culture, and staff well-being.[15,16] All staff spaces would ideally provide natural light, a quiet environment and human centred design, taking full account of ergonomics and Occupational Health assessments in the layout of clinical spaces and placement of equipment and display screens[5]. The quality of the environment for staff needs to receive the same attention and consideration as that for patients and families. This includes private areas available for reflection, support, meetings and including rest areas with access to domestic services including hot food and drink within the unit footprint. For families and visitors, units may consider including extended bedside presence, appropriately sized and private waiting areas, sensitive discussion space, and consideration of end-of-life needs.

Design process and clinical engagement

To achieve all these requirements, building projects need an optimised and empowered design team[17] with strong leadership, a clear vision of future care and engagement across all professions, and representative patient involvement. Designs need to consider optimal collaborative working and shared visibility, ensuring adequate formal team spaces as well as informal communication and chance encounters ('corridor conversations'), which directly correlate with quality of care[3]. Clinical leaders need to have clear responsibilities, support mechanisms, training[8], and remunerated time. The project budget might include funds for clinical engagement exercises, as well as post-occupancy evaluation and post-occupancy optimisation processes. The physical design and facilities of an ICU ought to be understood as an evidence-based clinical intervention with clinicians seen as leaders and drivers, not merely stakeholders

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1.4 Clinical Information Systems

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INTRODUCTION

Clinical Information Systems (CIS) can be broadly defined as a computer-based system that is meant to gather, store, manage and access patient related health information. CIS can manage and process massive amounts of high-resolution data, allowing time and activity efficiency for doctors, nurses, and all intensive care staff. Examples of CIS installations have shown a reduction in medical error rates, improvement in compliance with unit standards of care, and better clinical notes recording, as well as improved reporting data. The challenge for the future of CIS is to add value to healthcare delivery.

MINIMUM STANDARDS

1. All ICUs must have a CIS or a strategic plan for the implementation of one.
2. **Procurement:** CIS procurement and customisation must involve a multidisciplinary collaboration of stakeholders who would typically use, maintain and develop the system.
3. **Compliance:** The CIS must comply with applicable national guidelines, governance, clinical and technical safety standards.[1-4]
4. **Business Continuity:** The CIS must have a rigorous business continuity plan (including contingency for power/system failure), with staff trained in its implementation available 24/7, always ensuring access to critical patient data; with no prolonged periods of routine downtime for planned updates or maintenance.
5. **Hardware:** There must be a dedicated workstation at each bed space, and an appropriate number of mobile and fixed devices on the ICU to meet the needs of medical, nursing and allied health staff.
6. **Implementation:** The NHS organisation and vendor company must have a robust plan for implementation of the CIS that supports all staff in its clinical and management use.
7. **Training:** The NHS organisation and vendor company must ensure the CIS is accompanied by a rolling programme of training for all end-users and stakeholders; prior to, during and after implementation; supported by clinical super-users and a multi-platform approach, with due consideration for temporary, rotating and ad-hoc users.
8. **Post-implementation:** The NHS organisation and vendor company must commit to ongoing product maintenance and development, to ensure the CIS keeps pace with the changing needs of intensive care, with 24/7 access to technical support available.
9. **Integration:** The CIS must automatically capture data from ventilators, patient monitoring and have interoperability with the core hospital patient administration system.
10. **Scalability:** The CIS must be scalable to accommodate surge capacity in multiple clinical locations.
11. **System Safeguards:** The CIS must have safeguards and warnings in place to prevent incorrect patient record entries.

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

1. Through a single sign-on, the CIS should be capable of bidirectional communication with key hospital systems involved in delivering patient care.
2. The CIS should be capable of prescribing and administration of medicines, including complex infusions, either directly or through integration with electronic Prescribing and Medicines Administration (PMA).
3. CISs should include automatic data capture from electronic devices used to deliver patient care, such as infusion pumps, renal replacement therapy (RRT) devices and cardiac output monitors.
4. The CIS should populate Critical Care Minimum Data Sets (CCMDS) and ICNARC Case Mix Programme /SICSAG data sets to facilitate benchmarking and governance.
5. The CIS should include embedded decision support tools and warning systems to ensure compliance with care bundles and alert staff to deteriorating patients.
6. The CIS should enable integration with NHS-approved systems including Artificial Intelligence (AI) tools.
7. The CIS should be developed to support activity related to intensive care, such as quality improvement, research, rehabilitation and post-ICU follow-up, and intensive care outreach services.

BACKGROUND AND EXPLANATION

In a world of ever-increasing data, a focus for the future must include how to reduce information overload, how to improve efficiency and quality, and how to reduce medical error. There is an evolving evidence base around the use of CISs to improve patient safety and quality.[5] The introduction of a CIS has been proven to reduce length of stay,[6] errors in decision making,[7,8] and errors in drug prescribing.[9] Using CIS has proven to be time efficient. However, poor system design is linked to clinician stress and increased rates of burnout.[10] Being mindful of the user experience and Human Computer Interaction (HCI) is of vital importance.

A patient in the ICU may require over 200 clinician-led, evidence-based decisions a day. The potential for error is real. The functions of a CIS that make it an invaluable tool include the capture of complex high-resolution physiological recordings, data from devices used during the patient care process, fluid and medication prescribing and administration, staff activities and decisions in ICUs, together with administrative data for commissioning.

Hospitals may opt for a specialised CIS or one that forms part of a wider electronic health record (EHR). If a CIS is a component of an EHR, these clinically focused systems integrate a wide variety of applications within a monolithic architecture. Long-term sustainability and modernisation of CIS should be factored in. A well-designed integrated customised CIS can reliably standardise and reduce variation in this decision-making process and deliver a more consistent experience for all patients.[11] Evidence is well established for the superiority of CISs in care bundle compliance[9] and in alerting for specific patterns of disease, e.g. early detection of sepsis[12] and ARDS[13]. CIS help improve the delivery of evidence-based strategies to achieve high rates of compliance, e.g. low tidal volume ventilation[11] and central line care bundle delivery.[14]

Translation of real-time data into alerts or summary intelligence about performance of individuals, teams and clinical services, with instant feedback via dashboards and automated alerts to mobile devices, modifies decision-making practices and improves the clinical effectiveness of clinicians as well as enhancing patient safety and quality.[12,13] Moving to a digital platform will enable remote access and support across sites. There are unique opportunities to collate and mine large sets of granular data, leading to better prediction of outcomes and allocation of resources.[15]

Successful CIS procurement and customisation will be achieved by involving a multidisciplinary collaboration of stakeholders who would typically use, maintain or develop the system. The stakeholders can include, but not be exclusive to a project manager, dedicated clinical representation, procurement officers, clinical engineering, the CCIO (chief clinical information officer) and ICT (information and communication technology) specialists. CISs need to be compliant with applicable national guidelines, regulations, clinical and technical safety standards e.g., the set of common specifications, frameworks and implementation guides that support interoperability.[1-4] Implementation will be enhanced if the CIS supports all staff in its clinical and management use; including eHealth, medical physics, clinical, management, technical and support departments. Additionally, the CIS could benefit from being designed to allow bidirectional communication with key hospital systems involved in delivering patient care, such as point of care testing, ePMA, laboratory and imaging systems.

If one consistent message has emerged from the literature on improving quality and safety in healthcare, it is that high-quality intelligence is indispensable.[5] Intensive care as a specialty must now embrace more formal processes to balance rising costs, complexity of care and patient safety. Application of systems engineering principles to CISs in the intensive environment will further enhance the safety and quality of care of our patients.

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1.5 Clinical Equipment

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INTRODUCTION

The modern ICU is a high-tech area with diverse clinical equipment requirements for diagnosis, monitoring and delivering treatment. Such equipment has to be available on a 24/7 and emergency basis, although the precise requirements will be determined by the characteristics of the anticipated patient population. The safe use of a wide variety of patient-facing technology requires staff to acquire and maintain their skills and knowledge. Guidance has been published by the Intensive Care Society[1].

MINIMUM STANDARDS

1. All equipment must conform to the relevant safety standards.
2. All equipment must be regularly serviced and maintained in accordance with the manufacturer's guidance.
3. An uninterruptable power supply must be provided, adequate to provide at least one hour of continuity of any critical equipment that does not have battery back-up.
4. Equipment must be uniquely identified and listed on an appropriate asset register along with details of its life cycle and service history/requirements to facilitate planned maintenance and replacement.
5. Sufficient equipment must be available to meet the service demand for patient care in a clinically appropriate timescale, including in periods of surge.
6. ICUs must have appropriate systems in place to ensure an adequate supply of consumables.
7. There must be a designated equipment clinical lead for intensive care.
8. All staff must be appropriately trained, competent and familiar with equipment they are expected to use independently.
9. Electro-biomedical engineering (EBME) support must be available either in-house or on a contracted basis to ensure equipment is appropriately serviced.
10. There must be appropriate sterile services and documented procedures for decontamination of equipment.
11. There must be a robust mechanism for reporting adverse incidents resulting from the use of clinical equipment and responding to national safety alerts[2,3].
12. ICUs must have the facility to store clinical and point-of-care ultrasound images in an appropriate picture archiving and communication system, so they form part of the clinical record[4].
13. There must be an appropriate archiving system for diagnostic images which can be safely retained and be available for clinical review for the same duration of the patient record.

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

1. Equipment, wherever possible, should be standardised, both in ICU and across intensive care services that have more than one unit, and in other areas where elevated levels of clinical care may need to be delivered.
2. Equipment, wherever possible, should have the ability to transmit data to clinical information systems and core hospital patient administration systems.
3. There should be indemnity and governance policies in place for loan equipment.

BACKGROUND AND EXPLANATION

Clinical equipment in intensive care typically involves high-cost capital items. Patient, institutional and staffing considerations will guide exactly what equipment needs to be purchased and available. Clinical needs dictate equipment specification, but a competitive tender will be required for sums greater than a set institutional threshold for equipment not available through the NHS supply chain. The institution's purchasing department as well as the clinical engineering department has an essential role in ensuring compatibility with existing infrastructure, that servicing is feasible and so that any dependencies (e.g. on IT infrastructure) have been considered. A robust programme for the routine replacement of capital equipment is of paramount importance. Equally, the appropriate provision of an adequate supply of consumables is no less important than the equipment itself. Consideration and planning are required to provide any necessary additional capacity in both equipment and consumables in times of intensive care surge.

Equipment, once purchased, requires regular service and maintenance in accordance with the manufacturer's guidance and needs to be checked by clinical staff (medical, nursing, AHPs and support staff) immediately before use. Staff require a robust training and skills assurance process to ensure the safe and appropriate use of clinical equipment. The keeping of training records is an important aspect of risk assurance.

The decontamination (cleaning, disinfection, and sterilisation as appropriate, depending on equipment risk category and sensitivity of devices[1]) relies on staff training and the appropriate provision of sterile services. This will include the adherence to national standards for the re-sterilisation of endoscopes and other reusable equipment[5,6].

The designated clinical lead for equipment for intensive care can be supported by the EBME provider and works within the organisation's overarching equipment governance framework. The EBME support can be either in-house or on a contracted basis to ensure EBME personnel have the appropriate skills and equipment to service the equipment used. While the equipment lead may not lead on intensive care governance, they have a vital role in ensuring there is a robust mechanism for reporting adverse incidents resulting from the use of clinical equipment[2]. Serious incidents involving clinical equipment may also need to be reported to the Medicines and Healthcare Products Regulatory Agency (MHRA)[7]. Similarly, when the MHRA issues safety alerts pertaining to medical devices, or alerts by the device manufacturers[6] the equipment lead has a vital role in ensuring that such alerts are cascaded to staff and acted upon as appropriate.

Specific equipment considerations to meet local service demand:

- Immediate access to point of care blood gas analysis and glucose/ketone analysis on a 24/7 basis is an expectation for any ICU.
- Magnetic resonance imaging (MRI) compatible equipment for use where mechanically ventilated patients are to undergo MRI investigation. Clear labelling of MRI compatible equipment and staff training is required.
- The provision of diagnostic ultrasound equipment is best guided by the likely patient population and staff expertise. At the very least, patient care in ICU requires immediate access to sufficient ultrasound equipment to ensure that intravascular catheters can be placed safely and in a timely manner, even in emergent circumstances

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1.6 Intensive Care Ultrasound

Authors: Marcus Peck, Ashley Miller, Hannah Conway & Prashant Parulekar

INTRODUCTION

Intensive care ultrasound is quick, non-invasive and facilitates the acquisition of critical information when and where it is most needed. As such, it has become an integral part of managing critically ill patients[1-5]. While it has many clear benefits, it also consumes intensive care resources and constitutes potential clinical risk. The following standards and recommendations are designed to promote safety and quality in any intensive care ultrasound service.

MINIMUM STANDARDS

1. ICUs must have the equipment to provide point of care intensive care ultrasound[6,7].
2. Ultrasound machines must be equipped with linear, curvilinear, and phased array probes.
3. Ultrasound equipment must be readily available, serviced regularly and part of a capital replacement program.
4. ICUs must have a clinical lead for ultrasound.
5. Dedicated infection control guidance must be accessible and its compliance audited[8].
6. Providers who scan and report independently must be trained to an appropriate level for their clinical practice.
7. When performing scans to inform clinical decision making, providers must store a structured report in the patient record.
8. When performing scans to inform clinical decision making, providers must store images for quality assurance purposes.
9. When performing scans for training purposes, learners must only store reports in the patient record if a trained provider has verified them first.
10. Transoesophageal echocardiography (TOE) must be immediately available in all cardiothoracic ICUs and those units providing extra-corporeal circulatory support[9].
11. ICUs must have the facility to store clinical and point-of-care ultrasound images in an appropriate picture archiving and communication system, so they form part of the clinical record[10].

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

1. All ICUs should be able to train staff in intensive care ultrasound.
2. ICUs that engage in remote review and/or supervision should employ secure, cloud-based image transfer systems.
3. The clinical lead for ultrasound should have sufficient time in their job plan for the associated quality assurance processes.
4. The intensive care ultrasound service should be supported by a fully trained link-person within the cardiology and radiology departments, as appropriate.
5. ICUs should provide dedicated education and ultrasound governance meetings.
6. ICUs should foster robust quality assurance processes, including peer review of image and reporting quality.

BACKGROUND AND EXPLANATION

The most common use of intensive care ultrasound is for vascular access. Increasingly point of care ultrasound is used for whole-body imaging of critically ill patients. It is demonstrably superior to physical examination and chest radiography in detecting life-threatening causes of shock and acute respiratory failure, and many other clinical situations[11-13].

In an unstable patient, echocardiographic data, particularly Doppler derived, can provide haemodynamic information that adds valuable diagnostic and pathophysiological insights[3,4]. TOE may be of value in patients with poor transthoracic windows, trauma, patients following cardiac surgery, and those receiving mechanical circulatory support[9].

Ultrasound providers emanate from a variety of clinical backgrounds, providing they can achieve suitable levels of competence with appropriate training. Various competency-based ultrasound training and accreditation systems exist in the UK, most of which use an organ-based, modular approach. Knowing how to acquire, interpret and integrate images into clinical practice represents only the beginning of the learning process. To be a safe and effective ultrasound provider, and to develop new skills, one needs to be surrounded by the right framework of support and governance. This includes access to expert supervision.

Exposure to supervision may pose challenges as this depends on local availability of experienced trainers. Some centres have addressed these issues by embracing remote supervision through telemedicine software. This method facilitates immediate guidance, feedback and mentorship by overcoming geographical constraints and improving access to expertise[14-17].

Educational and ultrasound governance meetings play a crucial role in improving the quality and safety of patient care[17]. These meetings serve as essential platforms for exchanging knowledge, developing skills, and standardising practices among providers. The incorporation of such meetings is integral to the quality assurance processes recommended for each centre[19].

An essential component for providing a point of care intensive care ultrasound service is the appointment of an ICU clinical lead with responsibility for equipment, coordinating training and governance. Recognition of this role in that person's job plan is encouraged.

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1.7 Critical Care Outreach, Rapid Response Systems and Early Intervention

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INTRODUCTION

Critical Care Outreach Teams (CCOT), Rapid Response Teams (RRT) and Medical Emergency Teams (MET) are crucial in supporting and initiating early interventions in deteriorating and critically unwell patients, outside of intensive care. In the UK, most rapid response systems are configured as nurse-led critical care outreach teams providing 24/7 coverage[1,2].

Representing a multidisciplinary response, CCOT/RRT/MET teams are expected to achieve a designated level of practitioner competency to treat deteriorating patients and patients at-risk of deterioration[3]. Core components of care provision include system-wide avoidance of failure to rescue through patient-level management and treatment, supporting goals of treatment and care[4], staff education, and ward-based follow-up and rehabilitation post-intensive care (discharge liaison)[5].

Outreach can form the efferent limb of the rapid response system activation, with escalation of deterioration via early warning scoring systems to call for further help. A National Early Warning Score (NEWS or (NEWS-2)[6] is recognised as the current recommended tool for call systems[7,8]. Outreach can also play an important role in preventing ICU admission[4].

Getting it Right First Time (GIRFT) reported that 86% of all acute NHS trusts in England had CCOT services. Scotland and Northern Ireland do not yet have widespread adoption of rapid response systems, including critical care outreach, however the principles of formalised system-wide rapid response for deteriorating and at-risk patients remain. It is strongly hoped that in line with GIRFT recommendations and with the rollout of Martha's Rule, and implementation of the similar Worry and Concern response systems elsewhere in the NHS[1,9]; CCOT, RRT or MET will become consistently available 24/7.

MINIMUM STANDARDS

1. There must be a hospital wide, standardised approach to the detection of the deteriorating patient and a clearly documented escalation process, including to intensive care, available 24/7.[1,10,11]
2. All acute hospitals must use a validated track and trigger early warning score system that allows rapid detection of the signs of early clinical deterioration in all adult patients over 16 years and includes escalation procedures to intensive care services[4].
3. Hospital policies must clearly outline graded, patient escalation pathways, including through to intensive care services, as required.
4. Hospitals must ensure there is a clinical review of all patients with a NEWS ≥5 (or equivalent if NEWS2 not in use), a score of 3 in a single parameter or any clinical concern via a rapid response system incorporating intensive care expertise[6].
5. There must be clear governance through audit of track and trigger response systems[12] and action of poor compliance healthcare organisation wide, reportable at board level.
6. Hospitals must ensure patients receive care from appropriately trained critical care outreach, rapid response or equivalent teams[3,4,10].
7. All patients must be reviewed by CCOT (or equivalent) following discharge from the intensive care unit to the ward, due to increased risk of deterioration post-ICU for as long as they are at risk (and at least in the first 24 hours).
8. All critical care outreach teams within acute hospitals in England and Wales must use the National Outreach Forum national minimum dataset[13] for collating metrics on critical care outreach/rapid response team activity in order to provide clear data for benchmarking on their outcomes and activity.

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

1. Critical Care Outreach Teams (CCOT), Rapid Response Teams (RRT) or Medical Emergency Teams (MET) should be available 24/7[1].
2. There should be regular (quarterly and annual) review of activity to review service provision, and liaison with the appropriate patient safety champions and committees in the hospital[14].
3. Critical care outreach should sit within intensive care directorates to ensure rapid access to intensive care facilities, provision and professional support, as needed.

4. Critical care outreach staff, whether they sit within or outside intensive care directorates, should possess intensive care competency (enhanced, advanced, consultant), and achieve the competency level set out as part of their role description and in line with the Critical Care Outreach Practitioner (CCOP) Framework[3].
5. Acute kidney injury alerts, or similar pathological markers, should work in concert with any track and trigger early warning score system to ensure recognition of deteriorating and at-risk patients.
6. There should be a patient/carer activated system, supported by critical care outreach services, for escalating concerns about deteriorating patients all the way up to intensive care, through mechanisms such as Call for Concern[4,15,16].
7. There should be accessible educational support for registered and non-registered ward staff in caring for the acutely ill and deteriorating ward patient[4,10], supported by critical care outreach and rapid response teams.

BACKGROUND AND EXPLANATION

The development of outreach has been embraced by hospitals seeking to address failure to rescue and the ongoing limitation of intensive care bed capacity, preventing unnecessary mortality and morbidity of critically ill ward patients, and providing care regardless of location. Rapid response systems, including CCOT/MET, have evolved into a wider variation of configuration, dependent upon perceived local need and resources available. This has led to a wide variety in the provision of these services. As outreach from intensive care services expand across the NHS, quality indicators and operational standards[5] help guide configuration of services and future provision.

Despite equivocal early evidence for certain patient outcomes such as mortality, readmission or length of stay[17,18], the value and impact of CCOT, MET and rapid response services are still advocated and widely recognised[1].

CCOT, MET and other rapid response services support acutely and critically ill patient pathways, working collaboratively with other parts of the hospital, and their remits include measures to tackle 'failure to rescue' through early identification and management of patient deterioration; addressing treatment goals and treatment preferences with patients; timely admission to an intensive care bed when required; and delivery of effective follow-up for patients post discharge from intensive care.

Outreach from intensive care and rapid response encompasses seven core elements, set out using the PREPARE acronym:

- Patient track and trigger
- Rapid response
- Education, training and support
- Patient safety and clinical governance
- Audit, evaluation and monitoring of patient outcome and continuing quality care
- Rehabilitation after Critical Illness (RaCI)
- Enhancing service delivery[5]

Hospital policies must clearly outline graded patient escalation clinical pathways, including through to intensive care services, as required. Graded clinical response strategy consists of three levels: low, medium and high[11]. This incorporates escalation to intensive care services. Each level of response should detail what is required from staff in terms of observation (vital sign) frequency, skills and competence, interventional therapies, and senior clinical involvement, with intensive care expertise. It should define the speed and urgency of response, including a clear escalation policy (incorporating the process for referral to intensive care for an intensive care bed, treatment escalation plans for limitations of medical treatment and goals of care discussions) to ensure that an appropriate response always occurs and is available 24/7.

There must be clear governance through audit of track and trigger response systems[16] and action of poor compliance healthcare organisation wide, reportable at board level. This may be the responsibility of critical care outreach or wider patient safety teams. Data capture of activity and outcomes related to CCOT/RRT/MET is a core activity so that services can be benchmarked across regions and nationally. Activities undertaken by outreach are broad, as outlined in the framework[3], and include discharge liaison to ensure optimal recovery for both patients at-risk and post-intensive care patients, supporting rehabilitation post-critical illness[19]. Also fundamental to CCOT/RRT/MET activity is supporting ward-staff education[3,20]. In some hospitals, outreach can support maternal services and enhanced care areas. Rapid response services provision may also collaborate with other services, encompassing e.g. altered air-airway support, resuscitation team, hospital at night services and acute pain teams. However, caution is required to ensure that integration of CCOT/RRT/MET with teams such as hospital at night or other services does not limit access to deteriorating patients in a timely manner due to competing demands.

Hospitals must ensure patients receive care from appropriately trained critical care outreach, rapid response or equivalent teams[4,10]. These teams may sit outside intensive care services but should possess competency in the care of critically ill patients (enhanced, advanced, consultant) within the service and achieve the competency level set out as part of their role description and in the Critical Care Outreach Practitioner (CCOP) Framework[3].

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1.8 Cardiothoracic Intensive Care

Authors: Tony Vassalos, Mike Charlesworth & Ollie Dare

INTRODUCTION

Across the UK, a variety of cardiothoracic ICU models exist, ranging from standalone supra-regional tertiary referral centres to smaller units supported within a large general hospital setting. Following the COVID-19 pandemic delays to patient pathways have resulted in patients with more complex physical, social and medical comorbidities presenting urgently and in a more morbid condition.

This has led to an increasingly challenging cardiothoracic intensive care environment in which patients with acute and advanced heart failure, heart and lung transplantation and mechanical circulatory support are commonplace.[1-3]

The consultant-led multidisciplinary team requires understanding of the individual cardiothoracic condition along with full general intensive care expertise. While the guidelines for the provision for general intensive care services also apply to cardiothoracic intensive care, specialist additional requirements are needed for the delivery of standard cardiothoracic intensive care.

MINIMUM STANDARDS

1. ICM Consultants providing out of hours cardiothoracic intensive care and advice must have regular daytime timetabled sessions in cardiothoracic intensive care.
2. Staffing must adhere to the minimum standards outlined in the relevant staffing chapters of GPICS V3.
3. In addition to the on-site medical doctor or ACCP, there must be a cardiothoracic surgeon.
4. There must be 24/7 access to staff with advanced airway skills.
5. Clinical perfusion services, theatre staff and appropriate facilities must be readily available for emergency resternotomy and cardiopulmonary bypass 24/7.
6. Those on the on-site rota must be trained in Cardiac Surgery Advanced Life Support (CALS) and capable of chest reopening 24/7[4].
7. The equipment to perform transoesophageal echocardiography (TOE) must be available immediately in all cardiothoracic ICUs and those units providing extra-corporeal circulatory support[5], with access to a clinician competent in TOE readily available 24/7.
8. The care for all cardiothoracic surgery patients must meet the requirements of similar patients cared for in a general ICU as per GPICS standards.
9. The care of patients within each cardiothoracic intensive care area must be directed by a job-planned consultant in cardiothoracic intensive care medicine, through a structured bedside ward round that involves access to multidisciplinary input 7/7.

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

1. Cardiothoracic ICUs should have local acute heart failure patient pathways to provide 24/7 access to multidisciplinary review and consideration for advanced heart failure therapies[6].
2. There should be an Enhanced Recovery after Surgery (ERAS) lead nurse or consultant within cardiothoracic intensive care to drive enhanced recovery protocols[7,8].
3. Prehabilitation of frail or high-risk cardiothoracic surgical patients should be available from a multidisciplinary allied health professional team[9,10].
4. Multidisciplinary decision making that includes advanced care planning should be undertaken with high-risk or complex cardiothoracic surgical patients as part of the consent process prior to surgery[11].
5. Transfer policies should be developed within tertiary referral centres to facilitate efficient transfer in of patients requiring cardiothoracic surgery and repatriation of cardiothoracic surgery and cardiology patients back to base hospital for ongoing care.
6. Centres in which primary percutaneous coronary interventions (PCI) are performed 24/7 or designated heart attack centres should consider developing protocols for the identification of and immediate management of patients suitable for extracorporeal cardiopulmonary resuscitation (eCPR)[12].

BACKGROUND AND EXPLANATION

The cardiothoracic surgical landscape continues to evolve to now include many forms of open, closed, minimally invasive, robotic and hybrid procedures. The nature of cardiothoracic surgery demands that all patients are cared for postoperatively in a unit that conforms to the GPICS standards of Level 2 or 3 intensive care facilities. Patients may frequently have complications and require rapid escalation of their level of care. ICUs therefore need to be flexible and responsive to the needs of the patient.[1,3]

At the same time the complexity of cardiothoracic patients is increasing with many patients presenting late, urgently and with significant measures of frailty. This is having a detrimental impact on patient outcomes emphasising the need to mitigate risks and determine if surgery is appropriate.[2] Cardiothoracic prehabilitation has been slow to develop compared to other surgical specialties but a recent increased awareness has demonstrated the potential benefits within a high-risk or frail patient cohort.[9,10] Enhanced recovery protocols need to be promoted together with advanced care planning to adapt patient pathways, personalise the care given and drive clinical excellence.[7,8,9]

The development and success of advanced heart failure therapies and ongoing work with extracorporeal cardiopulmonary resuscitation has further highlighted the emergent need for centralisation and organisation of our cardiogenic shock networks across the UK.[6] The success of such therapies has had a significant impact on the cardiothoracic intensive care environment with multidisciplinary team working required to maintain patient standards of care. Similar service expansion within interventional cardiology has further added to this burden.

Medical and nursing staffing challenges have led to new models of care provision. This has included the integration of ACCPs, clinical perfusionists, cardiologists and general intensivists working as members of the cardiothoracic intensive care. In high acuity units (e.g. those with transplant or extra-corporeal life support services), higher staffing ratios may be beneficial.

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1.9 Neurocritical Care

Authors: Lara Prisco, Charis Banks & Sandeep Lakhani

INTRODUCTION

Neurocritical care describes the specialist care required in the management of patients in intensive care with neurosurgical or neurological disorders. Its provision in specialist neurosciences centres has been shown to reduce mortality and improve functional outcomes for patients[1].

The consultant-led multidisciplinary team requires understanding of the individual neuroscience condition along with full general intensive care expertise. While the guidelines for the provision for general intensive care services also apply to neurocritical care, specialist additional requirements are needed for the delivery of standard neurocritical care.

Early integration of specialist rehabilitation is vital. In addition to in-hospital mortality, long-term function is a key outcome metric. Deciding on the best interests or overall benefit of treatment may be challenging due to loss of capacity which is frequent in neurocritical care patients.

MINIMUM STANDARDS

1. Staffing must adhere to the minimum standards outlined in the relevant staffing chapters of GPICS V3.
2. ICM consultants providing out of hours neurocritical care and advice must have regular timetabled daytime sessions in neurocritical care[2].
3. Neurocritical care units must have access to appropriate clinical expertise from the following specialist services: neurosurgery, spinal surgery, neurology, stroke, diagnostic and interventional neuroradiology, neurophysiology and neurorehabilitation[3].
4. Patients must be cared for by a multidisciplinary intensive care team using agreed protocols, national, and international guidelines and recommendations[3].
5. Neurocritical care units must have access to appropriate equipment and facilities and clinical expertise in their use and interpretation[4].
6. All patients requiring immediate lifesaving neurosurgery must be admitted to the local neurosurgical centre irrespective of the initial availability of neurocritical care beds[5].
7. All ICUs which may manage patients following traumatic brain injury must have up to date policies which follow national and international guidance, including discussion with specialists and, if required, transfer to a specialist centre[6,7].
8. Neurocritical care must have resources to support and be part of regional networks for the safe and timely management of all patients with relevant brain and spine pathologies, with agreed rational transfer and repatriation policies[8].
9. There must be processes in place within regional intensive care networks to request advice from their respective local neurointensive care services (in addition to neurosurgery and neurology), which is documented and forms part of the patient record.
10. The care of patients within each neuro intensive care area must be directed by a job-planned consultant trained in neuro intensive care through a structured bedside ward round that involves access to multidisciplinary input 7/7.
11. The care for all neuroscience patients must meet the requirements of similar patients cared for in a general ICU as per GPICS standards.

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

1. Neurocritical care units should seek to develop expertise in additional specialist equipment and facilities[4].
2. Neurocritical care units should have access to specialist clinical expertise from neuropsychology.
3. Neurocritical care patients' long-term outcome should be assessed at three months or later, in all needed adults who were admitted for more than four days, ideally in specialist neurocritical care follow-up clinics[9,10].

BACKGROUND AND EXPLANATION

Since the publication of GPICS V2.1 in 2019, we have seen the conclusion of CENTER-TBI project with over 250 publications to date[11], the widespread expansion of 24/7 access to mechanical thrombectomy services[12] and advances in multimodal monitoring in neurocritical care[13]. The COVID-19 pandemic has also formalised the regional critical care transfer network enabling safer movement of patients for both escalation of care and repatriation[14].

In developing the new standards and recommendations for GPICS V3 we have attempted to provide clear guidance on the facilities and equipment needed in the treatment of critically ill neurosciences patients. Acknowledging the fiscal pressures faced across the board, the recommendations allow for some nuance whilst recognising the importance of using individualised care parameters for our patients. Concurrent monitoring of cerebral electrophysiology, haemodynamic, and oxygenation can provide valuable insight into the true interpretation of the patient's underlying condition and may help guide prevention of secondary brain injury[13].

The emphasis on the breadth of specialist services neurocritical care patients require is recognition to the complexity of this cohort. By ensuring patients being managed in neurocritical care units have availability of expertise from neurosurgery, spinal surgery, neurology, stroke, diagnostic and interventional neuroradiology, neurophysiology and neurorehabilitation[15] we will impact the long-term functional outcomes.

The list below outlines the minimum expectation for a neurocritical care unit's in-house access to appropriate facilities, equipment which would include the necessary clinical expertise in their use and interpretation [10].

Facilities

- Diagnostic and interventional radiology (CT, CTA, CTP, MRI, DSA)
- Neurosurgical operating theatres
- Cerebrospinal fluid biochemistry and microbiology laboratory

Equipment

- Intracranial pressure monitoring
- 24/7 intermittent electroencephalography and evoked response monitoring
- 24/7 processed EEG monitoring
- Neurorehabilitation equipment (tilt-table, specialist chairs, etc.)

Neurocritical care units should seek to develop expertise in additional specialist equipment and facilities. Below are example facilities and equipment which are currently in use in various units across the UK either as modalities helping clinical decision making or for research purposes only. Some of these may form part of providing a quality service in the future[4].

Facilities

- Blood- and CSF- based proteomic and metabolomic biomarkers laboratory (or clinical pathway)
- Drug levels testing laboratory

Equipment

- Continuous 10/20 electroencephalography
- Brain Tissue Oxygen (PbO2)
- Transcranial doppler ultrasound (neurosonography)
- Pupillometry
- Near Infrared Spectroscopy
- Cerebral micro-dialysis
- Optic nerve sheath diameter (US/CT)

Finally, the standard that patients requiring life-saving neurosurgery must be admitted to the local neurosurgical unit irrespective of the availability of neurocritical care beds – made in January 2017 in the Coroners' Regulation 28: Report to reduce further deaths[5] – remains an essential standard of neurocritical care provision.

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1.10 Burns Care

Authors: Ascanio Tridente, Brendan Sloan, Nicole Lee & Ian Clement

INTRODUCTION

The exact incidence of burns injuries is not known, as some people do not seek medical advice. It is nevertheless estimated that around 250,000 patients suffer burns injuries in the UK each year[1]. There is a high prevalence of burn injury in the frail elderly and in those with severe mental health problems. Approximately 120,000 people with burn injuries attend Emergency Departments (ED) in the UK yearly, resulting in around 8000 admissions to secondary care. Of these, approximately 350 will require fluid resuscitation due to the severity of their injuries[2]. Treating burns victims is expensive, but volumes of activity are low, due to the combination of the intricacy and peculiarity of the injuries, and their infrequency[2]. It is therefore important that the most severely ill burns patients are cared for where specialist burns and intensive care expertise are both available.

Burn care in the UK is organised in centres, units and facilities. Patients with the worst injuries and highest intensive care requirements are cared for in centres, those with moderate size and severity burns in units, while facilities care for those patients with less complex burns. Most critically ill burn patients in the UK are looked after within a general ICU with burns surgical and multidisciplinary input. Some hospitals have a dedicated burns ICU.

The following standards and recommendations apply to all adult burn patients receiving intensive care.

MINIMUM STANDARDS

1. Working practices must promote multidisciplinary care between the burn and intensive care teams, encouraging joint decision making in line with British Burns Association standards[3].
2. A burns theatre must be located in close proximity (preferably within 50 metres) to any service providing intensive care for burn injured patients[3].
3. Burns patients requiring intensive care must be jointly managed by consultants in burns surgery and ICM with the appropriate level of burns specific training[3].
4. Clinical guidelines for treatment and care related specifically to burns patients must be available in ICUs which manage burns patients[3].
5. Thresholds for referral to adult and paediatric burns services must be adhered to, as detailed by the National Burn Care Referral Guidance[4].
6. Transfer of critically ill burn patients between services must comply with Intensive Care Society guidelines[5].

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

1. Services should have access to specialist care pathways to meet the needs of patients with mental health issues and those frail and elderly.
2. All burns over 20% total body surface area (TBSA) should have access to thermally controlled single-bedded cubicles[3,6].
3. Services providing burns centre level care should be, ideally, co-located with a major trauma centre[3].
4. Where burns centre level care cannot be co-located with a major trauma centre mechanisms for ensuring appropriate integration with major trauma centre care should be established.
5. The implementation of end-of-life care in the early stage of a burn injury should only be made following multidisciplinary holistic assessment, involving at least two consultants, one of whom should be a specialised burn care surgeon and the other an intensivist with experience in burns care[7].
6. There should be nominated intensive care and anaesthesia lead consultants for burns, who participate in network, regional and national clinical governance activities, morbidity and mortality audit meetings.
7. Where arrangements are in place for shared care between nursing teams from the burn care ward and ICU, there should be a minimum of one nurse each shift with CC3N specialist burn competencies[3,8].
8. In ICUs in Burns Centres and Burns Units, 75% of nursing staff should have CC3N specialist burn competencies[3].

BACKGROUND AND EXPLANATION

The latest data would suggest that the 50% mortality (LD50) for burns based on total body surface area (TBSA) affected depends on age group, varying from approximately 90% TBSA for the age group <50, to around 55% for

patients aged 50-79, and being as low as around 20% for patients agreed ≥80 years[9]. To achieve these outcomes, care needs to be provided by a fully integrated multidisciplinary team, with daily multidisciplinary ward rounds[3,10].

Guidelines

Clinical guidelines for treatment and care related specifically to burns patients must be available in ICUs which manage burns patients[3]. These may include:

- Fluid resuscitation and management of associated complications.
- Assessment and management of burns to the face and airway. Including the recommendation to use fibre-optic bronchoscopy or naso-endoscopy to assess inhalation injury.[11]
- Management of smoke inhalation injury and its sequelae, including carbon monoxide and cyanide poisoning.
- Recognition and management of the acutely unwell and deteriorating burn injured patient, including burn specific criteria for the diagnosis of sepsis.
- Management of hypothermia and hyperpyrexia.
- Management of burn wound infections including antimicrobial stewardship.
- Nutritional assessment.
- Rehabilitation.

Hypothermia

Hypothermia has a profoundly adverse effect on burn patients, who are particularly vulnerable during initial assessment and resuscitation. Strategies to vigorously prevent this, including provision of a thermoneutral environment, need to be used. One of simplest methods to reduce this hypermetabolic response is to increase the ambient temperature using a thermally controlled cubicle[3].

Infection

Infection is a significant cause of mortality in major burns. Methods of protecting patients from infection include early primary excision and skin grafting, regular aseptic dressing changes and isolation of the patient in a single-bedded cubicle.

Transfer

Transfer of patients between services may involve considerable distances due to the relatively small number of specialist burn-only intensive care beds in the UK. Services need to ensure that consideration is given to provision of adequate drugs, fluids, oxygen, and warming devices for lengthier transfers.

Research

Clinical studies directly relevant to the UK setting are few, in part due to the relatively small numbers of patients with significant burn injuries who present in more affluent countries. A collaborative approach to research with multi-centre trials is be encouraged.

Further information

Further detailed recommendations on the management of burn injured patients can be found in the 2023 document produced by the British Burn Association *Burn Care Standards and Outcomes*[3].

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1.11 Smaller Remote and Rural Intensive Care Units

Authors: Jack Parry-Jones & Catriona Barr

INTRODUCTION

Whilst other chapters in GPICS also apply to remote and rural ICUs, this chapter is intended to describe the steps small geographically remote units can undertake, with assistance from their local networks to develop sustainable solutions to maintain intensive care service for their local population.

There remain some differences in opinion about how best to define 'small' and 'remote'. For intensive care services, remote, defined as more than 30 km away from the next nearest ICU, is deemed more useful practically than small, defined as a unit serving a population of fewer than 200,000 people[1,2,3]. As intensive care has evolved in the UK, remote may also be usefully seen as how far away the nearest tertiary services are: cardiology intervention, neurocritical care, interventional radiology etc. Travel times, as opposed to distance, are also more useful but vary according to the time of day, time of year and weather conditions. The positive transformation of intensive care transfer and retrieval services has changed the way remote is perceived. In future, digital and remote access are likely to be paramount.

This guidance only applies to a minority of ICUs in the UK. Using the definitions of small (catchment population of less than 200,000), or remote (more than 30 km from the next nearest ICU):

Unit type	England	Scotland	Wales	Northern Ireland
Small	28	12	3	2
Remote	24	15	6	2
Small and Remote	18 (10.7%)	11 (33%)	3 (23%)	2 (22%)

NHSE Stocktake 2023	22 units in England defined as small	Fewer than 8 level 2 and 3 beds
Nuffield Trust	12 Hospitals in England defined as remote	Remote being more than 60 minutes to the next nearest hospital

MINIMUM STANDARDS

1. ACC network/regional network support must be provided to ensure small and remote units meet GPICS.
2. There must be access to advice from a consultant in ICM 24/7 (see Chapter 2.1 Consultant Staffing).
3. There must be a 24/7 dedicated on-site medical doctor and ACCP rota for the ICU (see Chapter 2.4 On-site Medical Doctor and ACCP Rota).
4. All ICUs must have immediate 24/7 on-site access to staff with a minimum standardised airway skillset (see Chapter 2.4).
5. All ICUs must have 24/7 access to staff with advanced airway skills.
6. Regional transport arrangements (road and air) must be agreed to allow timely, safe transfer of patients with an appropriate level of monitoring, staffing, and skills (see Chapter 3.14 Inter- and Intra- hospital transfer).
7. ICUs, including Level 2 units, must participate in a national patient outcome benchmarking audit.

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

1. Network support should be explicit, resourced and supported by all stakeholder healthcare organisations, including trusts/health boards, and regional networks and structures.
2. ICUs should consider the development of telemedicine (digitally enabled remote intensive care) techniques for clinical decision making and educational support, in conjunction with their regional network and specialist centres.
3. Remote ICUs should implement appropriate joint clinical governance procedures with both networked units and transfer services.
4. Where an intensive care pharmacist, practitioner psychologist or AHP service, cannot be effectively delivered locally in a small unit, advice should be accessible from specialist colleagues through network support.
5. Training bodies should devise and support remote and rural training posts in intensive care.
6. Small and remote units should, where practical and feasible, implement cross site working for all multidisciplinary staff to maintain retention of skills and training.

BACKGROUND AND EXPLANATION

Small and remote hospitals continue to provide an essential acute service to their local communities and often to tourists. Without intensive care many acute hospital services would not be possible. There is evidence that centralising some acute care services improves outcomes but there is also increasing recognition that patients benefit from care closer to home.[4,5] This means acute in-patient care, and therefore intensive care input, is likely to remain part of many small and remote hospitals.

In providing the necessary on-site intensive care to this cohort of patients, the smaller volume of patients necessitates different staffing patterns. The challenge is to implement a system which allows a combination of task-based skills available 24/7, within an overarching strategic support structure. Networked solutions are therefore embedded into these standards and recommendations. Three key areas that need local and network decisions are: recruiting and retaining staff including consultants, specialists, other non-consultant medical doctors and ACCPs**;** the maintenance of core nursing skills and competencies; and overall service sustainability. Of these, multidisciplinary staffing remains the single biggest issue raised by small and remote units themselves[6].

Consultants (see Chapter 2.1 Consultant Staffing)

Staffing structures reflect the smaller volume of patients and, in common with many specialties, it can be difficult to achieve separate consultant on-call rotas. Evidence points to the importance of dedicated consultant in ICM presence but evidence for dedicated overnight intensive care consultant cover is less clear. The limited evidence available from the UK suggests that patient outcomes are not worse when consultants combine out-of-hours activity in ICM with another specialty.[7] The standard of a consultant in ICM directing care is key to achieving the best outcomes, and this can be met in small or remote units by 7/7 daytime cover with consultants in ICM and remote access to out-of-hours advice from consultants in ICM when needed. This could be by local or network arrangement.

On-site 24/7 Rota (see Chapter 2.4 On-site Medical Doctor and ACCP Rotas)

There must be a 24/7 dedicated ICU on-site medical doctor or ACCP staff member. This will normally include a person dedicated to the ICU, however currently in very small, remote hospitals it may be necessary to combine roles, provided that processes are in place to call additional staff when required.

Within current workforce constraints and training requirements, a dedicated ICU on-site tier comprised of combinations of SAS, LED (locally employed doctors), IMTs (internal medicine trainees), ACCS (Acute Common Care Stem), ACCPs, with necessary basic airway skills and immediate access to staff with a minimum airway skillset.

The on-site overnight team could comprise of a hospital on-site anaesthetist and an on-site dedicated ICU staff member without a minimum airway skillset. The team would work together, so all are involved with intensive care patients. The skill-mix of the on-site overnight team may vary, and the amount of on-site consultant presence needs to reflect this.

Maintaining competencies

In providing a service in small and remote hospitals, intensive care staff may be faced with looking after patients of any age with the full range of life-threatening emergencies. Furthermore, individual pathologies or age groups may be seen infrequently. Maintaining safe levels of technical skills for such a broad range of patients requires increased training resources for both medical and nursing staff. This may involve funding cross-site working with larger or specialist centres where geography allows, or by periodic attachments to other units. 'Telemedicine' and more modern video linkage, both for clinical input and continued professional development, can help improve collaboration and needs to be encouraged and developed.[8] Utilising network experience in using online communication platforms allows successes to be consolidated and built upon.

Transfer services

Patients may need transfer from remote and rural units because of the need for a higher level of care or for specialist care, and it is particularly important for remote and rural units that transport arrangements are timely, comply with intensive care transfer standards, and where at all possible, do not deplete remote and rural units of their essential staff. Some patient groups need particular transport arrangements which need to be incorporated into planning: examples include those with infectious diseases, bariatric patients, patients referred for time critical interventional radiology procedures, and secondary transfers for major trauma patients. Patients may also need to be transferred back to small and remote units for care closer to home and families.

Sustaining the service

Recruiting and retaining medical staff, including SAS doctors and locally employed doctors, to work in small and

remote hospitals hinges on work-life balance combined with suitable on-going training so they are equipped to work confidently as generalists. Utilising a wider group of doctors to participate in intensive care provides a key to their training as well as a sustainable rota. Support from national bodies is important so that staff feel their work is regarded as equally valid when compared to large tertiary centres. Lastly, there needs to be a focus on increasing medical ICM training attachments to remote and rural hospitals. Doctors in training are more likely to return as consultants to hospitals where they have training experience. Units themselves benefit; having doctors in training keeps a unit vibrant, and the connections help guard against professional isolation. Organisations which supervise training would do well to be mindful of the needs for generalist consultant cover when developing curriculum content and setting learning outcomes.

Level 2 only units

A subset of small and remote hospitals provide only Level 2 beds accompanied by a stabilisation and transfer service for Level 3 patients. This situation most commonly arises due to resource limitations, financial and staffing, or due to providing post operative enhanced care e.g. orthopaedic services (see Chapter 1.12 Enhanced Care).

The absence of Level 3 patients on site presents challenges in the recruitment and retention of medical and nursing staff, and care may not be directly provided by a consultant in ICM. For registered nurse staffing ratios, more information can be found in Chapter 2.5 Registered Nurse Staffing). As noted in the minimum standards above, there must be access to advice from a consultant in ICM 24/7. A supportive network structure is therefore essential for all staff to feel confident in delivering patient care.

Such units require immediate access to telemedicine advice from a linked Level 3 unit or retrieval service. Resourcing in a linked Level 3 unit needs to reflect the support, advice and educational role that it has for partner Level 2 units. This is reflected in the quality recommendations above.

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1.12 Enhanced Care

Authors: Jack Parry-Jones, Stephen Webb & Tim Wenham

INTRODUCTION

A gap has existed between intensive care services and ward care for a wide variety of different patient groups. The development of better Critical Care Outreach Team (CCOT) services and wider recognition of the deteriorating patient does not remove this gap; rather, the CCOT may provide clearer recognition and data for the need to develop enhanced care units. Some services, e.g. coronary care, respiratory support, weaning, stroke and renal units already recognise this gap and provide enhanced care for their patients. There is also a wide increasing recognition that enhanced care for other select patient groups, for example maternity[1] can provide safer more effective care.

Enhanced care services need not necessarily sit within intensive care services, but the intensive care service needs to be directly engaged, to provide the necessary safety and governance if an increase in the level of care is deemed necessary.

MINIMUM STANDARDS

1. Enhanced care services must sit within a designated lead directorate, engage in appropriate national data collection, and utilise patient, carer and service user feedback to improve services.
2. There must be a clear leadership structure with a designated lead clinician and lead nurse.
3. To promote a cohesive well-functioning unit, all specialties and clinical leads interfacing with the Enhanced Care service, including intensive care, must meet on a regular basis.
4. There must be clear operational standard operating procedures (SOPs) covering admission, daily operations, transfer and discharge.
5. There must be twice daily senior clinical decision maker documented review with one being a consultant-led ward round with the nurse-in-charge with input from other appropriate MDT members.
6. There must be clear clinical escalation procedures to Level 2 or Level 3 intensive care in the event of patient deterioration.
7. Enhanced care units that do not have on-site intensive care services must have the ability to treat and stabilise patients, with an established agreement with the local intensive care service and transfer services to move patients when escalation to intensive care is deemed appropriate.
8. There must be regular multidisciplinary governance meetings.
9. There must be clear policies on the level of monitoring and treatment appropriate to the needs of the patient group and the enhanced care unit.
10. There must be a robust handover policy, including documentation of clear parameters for further escalation.
11. All patients admitted to an enhanced care unit must have a documented and agreed Treatment Escalation Plan (TEP).
12. The TEP must be reviewed at the time of discharge, including suitability of re-admission for enhanced care and/or intensive care.

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

1. Enhanced care units should refer to the relevant curriculum and published guidance to determine the grade of doctor or Advanced Clinical Practitioner most appropriate to deliver care.[1-4,6]
2. Registered practitioners working in enhanced care areas should meet the National Competency Framework for registered practitioners: Level 1 and Enhanced Care Areas.[2]
3. The registered nurse:patient ratio should match patient acuity, skill mix, volume of work and the variety of services offered.

BACKGROUND AND EXPLANATION

It is difficult to provide a set of universal standards and recommendations for enhanced care services because local needs and solutions to those needs can be very variable. There is also an increasing recognition of the need for enhanced care units covering acute medicine, respiratory medicine, post-operative care, and immunotherapies including CAR T (Chimeric Antigen Receptor T cell therapy). The number of patients receiving immunotherapies, with its attending risks of e.g. cytokine release syndrome, immune effector cell-associated neurotoxicity and sepsis, is set to increase considerably in the next 5-10 years.

Standalone enhanced care units that don't have on-site access to intensive care services such as in elective 'cold' surgical sites, need to pay particular attention to recognition of the deteriorating patient, the ability to stabilise and treat patients prior to safe and timely transfer to critical care, and the decisions over where elective surgery is best undertaken by regular review of morbidity and mortality.

These standards and recommendations borrow heavily from published work by the Faculty of Intensive Care Medicine, the Society of Acute Medicine, the Intensive Care Society and the British Thoracic Society[1-5]. Depending on what type of enhanced care service is being developed or envisaged, we recommend the references provided at the end of this chapter. We also recommend speaking directly with those who have already developed such enhanced care services for lessons learnt in their delivery. Others' experience regarding operational structures, clinical processes and governance arrangements will be invaluable to the development of new services.

By first describing the service and then defining the required skills, it will be easier to identify the personnel best equipped to deliver this safely. The team will consist of a variety of medical and non-medical staff based on local factors and will vary both within and between organisations. Data arising from the implementation of Martha's Rule may have an additional effect on driving future changes in the local provision of enhanced care services.

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1.13 Interaction with Other Services: Microbiology, Pathology, Liaison Psychiatry and Radiology

Authors: Esther Davis & Raymond McKee

INTRODUCTION

Intensive care is a multidisciplinary arena which, by its very nature, requires timely interaction with multiple services. Certain specialty areas have more significant impact on patient management; these are considered in greater detail.

MINIMUM STANDARDS

1. Telephone advice from a microbiologist must be available 24/7[1,2].
2. Further interpretation and clinical advice from the relevant consultant pathologist or clinical scientist must be available 24/7[3].
3. Clinical pathology and radiology providers must have systems in place to identify and rapidly communicate critical or unexpected results[4,5,6].
4. Clinicians must have robust mechanisms in place so that appropriate action is taken following rapid communication of critical and unexpected results[4].
5. A radiologist must be immediately contactable to support the diagnostic management of acutely ill patients 24/7[5,7].
6. Units that provide acute care must have access to interventional radiology (IR) services either onsite or by formal arrangement to transfer to a site where the service is available[8].
7. Imaging and reporting for patients with critical conditions must be prioritised[5,6].
8. Liaison psychiatry services must review all mental healthcare referrals within 24 hours of referral[9–11].

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

1. There should be planned microbiology input to patient care on a daily basis; regular 'in person' ward rounds to facilitate team discussion and learning are preferred[1,2,12].
2. Liaison psychiatry staff should be available to advise acute colleagues on issues around mental health and capacity[9,10].
3. Regular clinico-radiological meetings should occur to facilitate team discussion and shared learning.

BACKGROUND AND EXPLANATION

Intensive care is a multi- and interdisciplinary specialty. This includes the services provided by psychiatry, radiology, microbiology and other laboratory-based specialties to effectively and safely manage the complex, critically ill patient. The standards and recommendations in this area have been refined and reworded based on updated evidence and standards from other specialties, as well as consideration of their pragmatic application.

This includes specific updates around microbiology where the principle is regular consistent two-way discussion between teams. This enables timely advice, based on accurate, appropriate clinical information. It has become increasingly clear that a flexible approach in how this is provided may ultimately result in more consistency without compromising effectiveness.[1,2,12]

The communication of urgent, and clinically important findings from the laboratory or radiology departments are vital for patient safety, as are subsequent robust mechanisms to respond within intensive care. This is emphasised in these simplified standards.

Fostering relationships between other specialties and intensive care clearly has tangible advantages within daily practice for our decision-making on treatments and investigations as well as mutual education. Establishing these communication channels in routine situations will then reap benefit in more critical and urgent scenarios. This culture within an ICU underpins the ability to fulfil the recommendations in this area.

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1.14 Prolonged Mechanical Ventilation and Complex Home Mechanical Ventilation Services

Authors: Ben Messer, Michael Davies & Louise Rose

INTRODUCTION

Approximately 5% of ventilated, critically ill patients will not wean successfully from mechanical ventilation within 21 days.[1,2] Up to 20% of these will require long-term invasive ventilation and 40% non-invasive ventilation (NIV) in the community following discharge from a Specialised Weaning Unit (SWU).[3] There is evidence that specialist teams that offer a structured approach to the care of patients requiring prolonged mechanical ventilation (PMV) greater than 21 days improve patient outcomes.[4]

This section highlights the standards and recommendations relevant to the provision of intensive care services for patients who require PMV and would benefit from input from a SWU co-located within a complex home mechanical ventilation (HMV) service. National guidance endorsed by the Intensive Care Society and British Thoracic Society (BTS) on the structure of SWUs was published in 2023.[5]

MINIMUM STANDARDS

1. There must be a referral pathway to a SWU/complex HMV service which any intensive care unit can access for advice and/or assessment[5].
2. Patients receiving PMV must be managed by a multidisciplinary team with specialist expertise and experience in managing this patient group.
3. Any plan for advice from, assessment by, or transfer to a regional SWU must be made in collaboration with the patient and their family and documented in the medical record.
4. Locally agreed protocols must be in place to define which other patients are discussed with the regional SWU/complex HMV centre[5].

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

1. All patients with single-organ respiratory failure (continued invasive mechanical ventilation but no other acute organ support) at day 21 of their intensive care stay should have a documented review focused on the potential merit of referral to the regional SWU/complex HMV centre for advice, assessment or transfer.
2. Patients with pre-existing comorbid conditions associated with weaning difficulties should be referred to the regional SWU/complex HMV centre at the soonest practical time-point of their intensive care stay.
3. The SWU/complex HMV centre should be staffed with a multidisciplinary team as outlined in the ICS/BTS SWU document[5].
4. Patients under the care of a regional complex HMV service, admitted to an ICU in another hospital, who are unable to be weaned to their baseline level of ventilation, should be transferred to the hospital where the regional complex HMV service is located at the soonest practical time-point of their intensive care stay.
5. The regional SWU/complex HMV service should be involved in hospital discharge planning and carer training for patients discharged home with HMV.
6. The care of patients receiving PMV who meet the criteria for discussion with SWU/complex HMV services should undergo careful review and ongoing audit including submission of data to a national database if available.

BACKGROUND AND EXPLANATION

A combined ICS/BTS document was published in 2023 recommending the SWU model of care for the UK and providing guidance on the standards of care and infrastructure for these units.[5] Admission to an SWU is only part of the continuum of care for patients with weaning failure. A collaborative approach within regional networks involving advice and potentially remote assessment from the SWU is encouraged.

Most patients requiring invasive mechanical ventilatory support in intensive care can be successfully weaned.[6] However, a small, but significant, proportion fail to wean and remain ventilator-dependent for a prolonged period. A 2003 UK study found that 12% of mechanically ventilated patients will require more than 28 days of respiratory support,[1] while a 2011 study found that 6% of patients will require more than 21 days of ventilatory support.[2] These patients have

higher mortality and occupy a disproportionate number of intensive care bed days, leading to increased healthcare costs.[2] More recent data in a non-UK setting found a PMV prevalence of 5% to 6%.[7,8]

The European Society of Intensive Care Medicine (ESICM)/ European Respiratory Society (ERS) 2007 international consensus document (currently being updated) concluded that ICUs may lack the structure and focus to manage patients with prolonged weaning failure.[9] Although a range of organisational models exist for management of these patients, a systematic review of 24 studies from 16 countries found better outcomes were associated with those patients admitted to a SWU.[4]

Key to successful patient outcomes is to ensure that all components of care are optimal. A multidisciplinary rehabilitation plan, optimal sedation management, and structured weaning plan may improve the rate and timing of weaning from ventilation. Furthermore, patients at risk of weaning failure need to be identified as soon as possible following admission to intensive care. Such patients include those with progressive neuromuscular disease, chronic respiratory disease and morbid obesity. Careful ongoing review and audit of criteria for discussion with SWU/complex HMV services is part of good patient care. This includes submission of data to a national database if available. In the event of PMV, discussion with and transfer to a SWU co-located with a complex HMV centre is associated with improved outcomes and facilitates discharge with NIV or invasive ventilation required by a majority of patients.[3]

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1.15 Critical Care Networks

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Contributions from NHS Wales Executive Critical Care, Trauma and Emergency Medicine Network, Andrew Mackay, Jon Silversides and the National Adult Critical Care Clinical Managers & Medical Leads Group

INTRODUCTION

Adult Critical Care Clinical Networks (ACC networks) have been in existence since 2000 and have evolved to meet service needs and expectations[1,2]. They were established to support delivery of a collaborative model of care for critically ill patients within defined geographical regions, improving equity of access, experience, and health outcomes. Service standards have redefined their function and governance; ACC networks support the monitoring and consistency of service delivery, irrespective of the responsible commissioner, to deliver high quality patient-centred care.

The standards and recommendations are based on the NHS England ACC Clinical Network Specification[3]. Whilst this specification was developed for the ACC networks within England, the standards taken from this document would be relevant for all networks across the four nations.

MINIMUM STANDARDS

1. Networks must develop, agree, and implement best practice pathways across the network that support improved patient flow and effectiveness of care.
2. Networks must monitor demand and capacity, working with network member organisations to have oversight of pathways and develop services.
3. Networks must work to reduce unwarranted variation in pathways and processes, including by working with other related networks.
4. Networks must monitor and improve quality, safety, experience, and outcomes according to the standards of the network service specification.
5. Networks must benchmark services nationally and with other networks to identify good practice and innovation through peer review and other network governance activities.
6. Networks must increase network effectiveness through training and development, identifying opportunities aligned with the network plan and assessing future workforce needs for the team.
7. Networks must identify and manage service risks through regional and system quality structures, following agreed escalation processes through their annual work programmes.
8. Networks must link and share best practice with all partners locally, regionally and nationally, identifying opportunities for shared solutions and resources.

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

1. Networks should support the development and implementation of extended health and wellbeing measures that enable staff to practice safely.
2. Networks should plan for capacity management at times of increased demand, including surge planning and mutual aid within and between networks.
3. Networks should contribute to the design of measures of quality, safety, and patient experience (through metrics that are SMART and widely captured).
4. Networks should evaluate the impact of any changes on quality, safety, experience, and outcomes across the whole pathway and identify vulnerable groups experiencing gaps in access, experience, and outcomes.

BACKGROUND AND EXPLANATION

ACC networks are clinically driven and support a culture of collaboration. Their success relies on the engagement, interaction and commitment of stakeholder members and participating member organisations to deliver agreed outcomes. These non-statutory organisations create climates for innovation and improvement that lead to the delivery of safer, high-quality, equitable patient-centred care. Networks have an important role to play in supporting the development and implementation of extended health and wellbeing measures to enable staff to practice safely. This includes psychological support that is easily accessible to intensive care staff.

ACC networks across all four countries of the UK have been established with broadly similar objectives. Although there has been national recognition of the positive impact of ACC networks, the structures, funding arrangements, prioritisation and reporting processes for the networks remain varied. It is important, that networks are resourced and supported to facilitate effective stakeholder engagement to deliver network plans, support continuous quality improvement and meet expectations.

England

In England, NHS England has produced an ACC network specification[3], which sets out expectations and the governance/accountability for ACC networks. They have also produced the *Adult Critical Care Service Specification*[4] which providers are expected to adhere to as part of the NHS Standard Contract.This document reinforces the need for critical care networks and will require that their members engage with their local network and comply with the functions and work plans of the network.

Scotland

Networks with formal management responsibilities do not exist in Scotland. Management of intensive care services in Scotland sits with each of the 14 territorial health boards. The Scottish Critical Care Delivery Group was formed from the clinician chairs of each acute Trust and, subsequently, the Health Board's Critical Care Delivery Group. This group has links to the Scottish Government through a senior medical officer and is being assimilated into the Centre for Sustainable Delivery (CfSD) using their national specialty delivery group model. The CfSD will play a key role in the recovery and redesign of NHS Scotland, and through this work, ensure ongoing delivery of sustainable critical care services across Scotland.

Wales

NHS Wales Performance and Improvement was introduced to drive improvements in the quality and safety of care and improve population health across Wales. In 2021 the *National Clinical Framework* heralded a significant change in the role and operations of networks, making them clinically led and strategic, rather than operational (the network can establish an operational network if one is required).[5]

The Critical Care, Trauma and Emergency Medicine Strategic Clinical Network launched in October 2023 with the expectation to provide strategic direction to the services and provide national direction on how best to organise, deploy and develop resources. Directed by the Quality Statement for Critical Care[6], the *Service Specification for Adult Critical Care Services in Wales*[7] was published in March 2023.

Northern Ireland

The Critical Care Network NI (CCaNNI) was established in 2007 to support the then Health and Social Care Board (NI) in commissioning intensive care services across the region. CCaNNI standing committees and Network Board had a remit to provide a robust framework to ensure decisions and developments maximised service development and ultimately patient outcomes. With the move of the functions of the Health and Social Care Board to the Department of Health (NI), CCaNNI is not currently active, and consideration is being given as to how best to deliver previous operational and strategic functions.

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1.16 Commissioning (England)

Authors: Ramani Moonesinghe and Anna Vogiatzis

INTRODUCTION

In England, adult critical care services are commissioned by both NHS England and by Integrated Commissioning Boards (ICBs) underpinned by the national service specification[1] which sets out the associated standards of service delivery.[2] The service specification is intended to be applicable to all adult patients requiring critical care irrespective of the source of funding.

The transition in England of delegated commissioning of adult critical care to ICBs which started in April 2024, will simplify commissioning arrangements and support system level planning based on local population need. Post-delegation, NHS England will continue to set consistent national standards, services specifications and clinical commissioning policies; develop metrics and quality dashboards to support improvement, oversight and assurance; and provide national clinical leadership, expert advice and support to ICBs. There are three data tools which support the commissioning of adult critical care:

- The Critical Care Minimum Dataset (CCMDS)[3] contains a subset of mandatory items for the generation of Critical Care Health Care Resource Groups (HRGs). CCMDS is also used in Wales.
- ICNARC Case Mix Programme provides risk adjusted data for England, Wales and Northern Ireland which incorporates and is consistent with CCMDS.
- The Directory of Service which is a daily data return provided by critical care services on occupancy, staffing and system pressure. It is used to update the Adult Critical Care capacity dashboard to support operational decisions, including in relation to mutual aid and responses to surge in line with published guidance.[4]

ACC networks[5] (see Chapter 1.15) provide an essential link between providers and commissioners in England with a focus on service improvement, quality of care and equitable access to services.

MINIMUM STANDARDS

1. All ICUs must comply with any national commissioning arrangements as set out in relevant service specifications.
2. All providers must contribute case mix and outcome data to peer audit.
3. CCMDS[3] must be collected and reported in all designated adult critical care locations.
4. Adult critical care reference cost submissions must assign costs to individual HRGs.
5. All providers must submit data to the Specialised Services Quality dashboard.
6. All providers must submit data twice daily to the National Directory of Service.
7. All providers of adult critical care must be members of an ACC network.

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

1. Trained personnel should collect all 34 fields in CCMDS.
2. There should be clinical oversight of the CCMDS data entry/data submission to ensure accuracy of data.
3. Preparation of reference costs should include experienced clinician involvement.

BACKGROUND AND EXPLANATION

In England, the adult critical care service specification was updated in 2023 to reflect changes to patient population and demographics, updated and new guidance, and standards. The service specification and associated quality metrics form part of the contract between providers and commissioners and is used to inform planning activity (bed days), case mix (% of each HRG) and the local prices via the annual contracting process. Healthcare providers and commissioners in England report against these plans in year, on a monthly basis. In parallel to this, providers report against defined indicators set out in the English national service specification on a quarterly basis and this is reported quarterly via the English National Dashboard.[4]

Activity data and case mix reporting

All providers must contribute case mix and outcome data to peer audit. This is via the ICNARC Case Mix Programme.

The Adult CCMDS[3] was mandated for use in 2006. This dataset, combined with the NHS HRG 4 grouper, categorises patient-related activity into one of seven healthcare resource groups[3]. The HRGs describe the total number of organs supported throughout an individual patient's clinical episode within critical care; healthcare organisations then quantify their actual costs per HRG through the annual reference cost submission.

Data collection should be done by trained personnel and commence from the date and time that the patient first occupies a designated critical care bed or, if in a non-designated critical care location (theatre recovery/ward), data entry should only occur when a patient has received critical care for a period of time in excess of four hours. The care received by patients in these non-designated areas will include clinical interventions, monitoring and continuous supervision normally associated with a critical care area.

The first critical care HRG based reference cost submission occurred in 2008/2009. These quantified total expenditures in England at £1.29B in 08/09. Activity has fluctuated over time; the table in below sets out these changes year on year[6].

Critical Care	Financial Year	£'b	Activity (bed days) 000	Activity (bed days) % change from 2014/2015 baseline
National Cost Collection: National Schedule of NHS costs - NHS trust and NHS foundation trusts	2014-15	£1,848	1,466	
	2015-16	£1,934	1,479	0.9%
	2016-17	£1,943	1,499	1.4%
	2017-18	£2,038	1,461	-2.6%
	2018-19	£2,130	1,491	2.1%
	2019-20	£2,149	1,327	-11.0%
	2020-21*	N/A	N/A	N/A
	2021-22	£2,815	1,313	-1.0%

*Accurate recording of cost collection was not possible during the COVID-19 pandemic.

Associated specifications and guidelines

The NHS England adult critical care surge planning guidance[4] was most recently updated in 2023, to reflect changes in the commissioned service landscape and the fluctuation in demands on capacity.

The Adult Critical Care capacity dashboard was first developed in 2020 as part of the response to the Pandemic, this was updated in 2022 to reflect the changes to capacity and to refine the data definitions to support operational decision-making.

ACC networks have been in place since 2000. The national network service specification[5] was published in 2023 which sets out the core, universal and extended functions of ACC networks in England.

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1.17 Commissioning (Scotland, Wales, Northern Ireland)

Jo Davies, Rory Mackenzie, Barbara Miles, Babu Muthuswamy, Richard Pugh & Jon Silversides

INTRODUCTION

Commissioning in Scotland, Wales and Northern Ireland does not occur in the same way as England. This chapter highlights the different approaches to funding and organising adult intensive care services in the devolved nations.

MINIMUM STANDARDS

1. All ICUs must comply with any national commissioning arrangements as set out in relevant service specifications.
2. All providers must contribute case mix and outcome data to peer audit.
3. In Scotland, all intensive care providers must contribute case mix and outcome data to peer audit via the SICSAG national audit.
4. In Wales, the Critical Care Minimum Dataset (CCMDS)[1] must be collected and reported in all designated adult intensive care locations.
5. In Wales, all providers of adult intensive care must be members of the National Strategic Clinical Network for Critical Care, Trauma and Emergency Medicine[2].

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

1. In Wales and Northern Ireland (as well as England, see Chapter 1.16), trained personal should collect all 34 fields in CCMDS.
2. In Wales and Northern Ireland (as well as England, see Chapter 1.16), there should be clinical oversight of the CCMDS data entry/data submission to ensure accuracy of data.
3. All providers of adult intensive care should be members of an intensive care network.

BACKGROUND AND EXPLANATION

Scotland

The NHS in Scotland is provided through 14 geographical NHS health boards and eight National NHS health boards, which provide national or specialist services. The budget is centrally allocated and calculated on a population basis, with adjustments made for factors that influence healthcare need, such as social deprivation or service provision over large, rural areas. Each board commissions adult intensive care beds based on local assessment of need with dependency definitions and benchmarking. This is done using a dataset very close to CCMDS collected through the Scottish Intensive Care Society Audit Group (SICSAG). All ICUs in Scotland are required to collect and submit a minimum dataset to SICSAG[3], which reports annually to the Scottish Government through Public Health Scotland and to health boards and the public. This includes quality standards, capacity, activity, and outcomes.

The Scottish Critical Care Specialty Delivery Group is formed from health board nominated clinical and operational leads with representation from other national partners including Public Health Scotland and supporting professions. It is hosted within the Centre for Sustainable Delivery, a Scottish Government commissioned body tasked with supporting NHS Scotland in the remobilisation, recovery and redesign of services. This group is tasked with reviewing pathways, processes, innovation and aspects of workforce with a strong focus on the measurement of impact of changes with an overarching aim of reducing inequalities in access to care. It provides improvement and implementation support to health boards with performance monitoring remaining a Scottish Government function.

Funded Scottish Level 3 general adult intensive care beds increased by 30 in 2021. Beds recorded within individual unit returns by SICSAG have continued to increase over recent years: 2019 Level 3 beds 193.3, Level 2 beds 300.7; 2023 Level 3 beds 218.5, Level 2 beds 338.5, reflecting individual board decisions around best local configuration of Level 3 and Level 2 bed distribution.

All intensive care providers in Scotland must contribute case mix and outcome data to peer audit via the Scottish Intensive Care Society Audit Group (SICSAG) national audit.

Wales

Adult intensive care services in Wales are provided by six health boards. Each of these health boards is responsible for the internal planning and delivery of intensive care services according to defined quality attributes (*Care of the Critically Ill Quality Statement, Welsh Government 2021*[4]), recommendations (*Task and Finish Group on Critical Care Final Report, Welsh Government 2019*[5]) and a national service specification (*NHS Wales Health Collaborative Service Specification for Adult Critical Care Services, NHS Wales Health Collaborative, 2023*[6]). Oversight is provided by the National Strategic Clinical Network for Critical Care, Trauma and Emergency Medicine and through its Critical Care Clinical Reference Group. Some specialist services in Wales may be directly commissioned by the NHS Wales Joint Commissioning Committee (e.g. ECMO, paediatric critical care, neurorehabilitation and long-term ventilation).

All intensive care providers in Wales must contribute case-mix and outcome data to peer audit via the national ICNARC Case Mix Programme. The Integrated Unscheduled Care Dashboard captures ICU capacity and staffing data, providing a measure of the operational pressures required for NHS Wales surge planning and mutual aid responses. Performance and activity indicators can now be monitored using the Critical Care Network Service Specification KPI Dashboard. Together, these dashboards will further inform critical care commissioning processes at local and network level.

There has been a recent small increase in intensive bed numbers from 176 to 181; in addition, Welsh Government funding of Post-Anaesthetic Care Unit services across Wales has enabled a clearer separation of planned intermediate- and high-risk surgical workflow and a potential freeing of intensive care capacity. In parallel, establishment of the Adult Critical Care Transfer Service has enabled more timely clinical transfers and repatriations closer to home when tertiary episodes end[5]. Longer-term planning of regional and national capacity and configuration is the subject of a current network-wide collaborative working group.

Northern Ireland

In Northern Ireland, the commissioning of intensive care capacity is currently undertaken by the Strategic Planning and Performance Group of the Department of Health. Capacity is commissioned through block contract with each of the provider trusts. There are currently 91 commissioned intensive care beds (73.5 Level 3 equivalent beds) across the five trusts. A needs assessment of capacity is close to completion. This will inform the future position for intensive care services in Northern Ireland.

All intensive care providers in Northern Ireland must contribute case mix and outcome data to peer audit via the ICNARC Case Mix Programme.

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Section 2

Workforce

2.1 Consultant Staffing

Authors: Matthew Williams & Teresa Evans

INTRODUCTION

GPICS V3 builds on the staffing standards previously recommended in GPICS V2. Patients need to be able to receive the same standard of intensive care wherever they are admitted in the UK. The minimum standards are expected to be achieved by all ICUs and for all patients. Adoption of the recommendations will have a beneficial impact on both quality of care and safety for patients, as well as support sustainable consultant staffing.

Medical care and senior decision-making in UK intensive care is led by consultants in intensive care medicine (ICM). Consultants in ICM are medical doctors on the GMC's specialist register, and either are a Fellow/Associate Fellow of the Faculty of Intensive Care Medicine or eligible to become a Fellow/Associate Fellow.

For some UK ICUs it will be important to read this chapter in conjunction with Chapter 1.11 Smaller Remote and Rural Intensive Care Units.

MINIMUM STANDARDS

1. There must be a designated clinical director and/or lead consultant for ICM[1].
2. A consultant in ICM must lead patient care on the ICU during the daytime, seven days a week.
3. The daytime consultant in ICM to patient ratio must not normally exceed a range between 1:8 and 1:12.
4. A consultant in ICM must undertake ward rounds twice a day, one of which will be face-to-face, 7 days a week.
5. If specialists are locally approved to provide consultant equivalent clinical activities, they must have access to advice from a consultant in ICM 24/7.
6. ICUs that remain staffed out of hours by non-intensive care consultants must have access to advice from a consultant in ICM 24/7.
7. A consultant/specialist must be responsible for clinical decision-making, admission and discharge on the ICU.
8. A consultant/specialist responsible for the ICU must be immediately available 24/7 (i.e., continually contactable and, if non-resident, able to attend within 30 minutes).
9. A consultant/specialist with any clinical commitment to intensive care, providing in or after-hours patient care, must have a minimum of 2 programmed activities (PAs) devoted to acute ICM within their job plan.
10. Daytime direct clinical care (DCC) PAs in ICM must be exclusively in ICM, with no additional responsibility for a second specialty at the same time.
11. Supporting professional activities (SPAs) must be recognised with a minimum 1.5 PAs for individual consultant revalidation requirements[2].

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

1. Consultant work patterns should be designed to facilitate continuity of care within the constraints of providing a sustainable out-of-hours service[3,4,5] and workforce.
2. The consultant rota should avoid excessive periods (>24 hours) of sole direct patient consultant responsibility.
3. A mechanism for consultant-to-consultant handover should be in place.
4. A consultant in ICM job plan should have a minimum of 4 DCC PAs in total, of which at least 2 are daytime DCC PAs.
5. All DCC PAs in ICM should be exclusively in ICM, with no additional responsibility for a second specialty at the same time.
6. Additional responsibilities for SPA activities should be recognised within job planned activities, and appropriate time allocated.
7. Sufficient DCC should be job planned to support relevant non-patient facing clinical (patient related) activities such as writing coroner/procurator fiscal reports and responding to incidents and complaints[6].
8. There should be daily access to multidisciplinary input from nursing (bedside and nurse-in-charge), microbiology, pharmacy and physiotherapy for clinical decision making.
9. There should be readily accessible input from dietetics, speech and language therapy, occupational therapy, and clinical psychology as required, to assist decision making.

BACKGROUND AND EXPLANATION

The key standard in GPICS V3 follows that of GPICS V2 in that the care of critically ill patients on ICU must be led by a consultant in ICM. It is expected that, where possible, all ICUs will evolve over time to have 24/7 consultant in ICM cover. Where this is not currently possible, solutions to have access to 24/7 consultant in ICM advice are required; these could include developing local network arrangements and the use of digitally enabled remote intensive care support.

The standards and recommendations are made to support intensive care consultant staffing models in all ICUs in the UK. The recommendation that a consultant in ICM job plan should have a minimum of 4 DCC PAs in total, of which at least 2 are daytime DCC PAs, will be pro-rata for less than full time consultants. This does not detract from the standard that consultants with any commitment to intensive care, providing in or after-hours patient care, must have a minimum of 2 PAs devoted to acute ICM. Daytime DCC PAs in ICM must be exclusively in ICM and the consultant cannot be responsible for a second specialty at the same time; this should also be the case after-hours. Maintaining scope of practice in ICM will best be accomplished by working some DCC in the daytime, ideally alongside other consultants in ICM colleagues and participating in ICU led CPD activities.

Closed units, where clinical decision making includes patient admission and discharge being directed by a dedicated consultant in ICM, are the optimum configuration to delivering intensive care[3]. A meta-analysis showed that these are consistently associated with reduced intensive care and hospital mortality and length of stay[2].

The best UK evidence to date on patient-to-intensivist ratio related outcome is by Gershengorn et al.[7] This utilises UK data from the Intensive Care National Audit and Research Centre (ICNARC) dataset. It demonstrated a U-shaped distribution of patient-to-intensivist ratio outcomes with an optimum ratio of 7.5 patients per intensivist during the hours of 0800 and 1600. Lower ratios and higher ratios of up to 12 patients per intensivist were associated with an increased mortality, after which mortality plateaued. This lends weight to the current division of large units into manageable 'pods'. The acuity and predicted mortality appear to impact on this ratio, however there is increasing consideration of secondary outcome measures being of equal or greater importance to both staff and patients. This includes morbidity, quality of communication and risk of burnout.[8] The evidence suggests that eight patients per pod is optimum, but this number could be higher, dependent on acuity and local service requirements.-

Rota patterns should support patient outcomes, patient and relative satisfaction and consultant career sustainability.[5,9] ICUs will vary according to acuity, workload and experience of doctors and practitioners employed, leading to a variance in optimal solutions for staffing. Some ICUs may wish, with local agreement, to utilise resident intensive care consultants, while others will support shift systems.[6,10] Rotas for consultants and resident staff have to be aware of the risks of fatigue and burnout. A consultant rota with fewer than eight participants is likely, with the frequency of nights and weekends, to be too burdensome over a career. The benefit of rotas supporting less than seven-day consecutive day working is increasingly recognised.[6,9,10] Blocks of daytime working with separate night-time cover are recommended, to provide continuity of care, whilst balancing these demands. Good handover of patient care from consultant to consultant is essential.

There is no clear standard for patient to consultant ratio overnight. An individual ICU will need to consider the workload, the acuity and the staffing at non-consultant level.

Specialists in ICM are doctors with at least 12 years postgraduate training and six years' experience in intensive care on a non-training programme. In some UK ICUs, intensive care specialists have been locally approved to provide some consultant equivalent clinical activities. The 2021 contract, and guidance documents on job descriptions, contracts and career progression for specialists clearly describe that such doctors can contribute to consultant equivalent clinical activities and, when working autonomously, can be the responsible named clinician.[11] Approval of specialists to provide consultant equivalent clinical activities, such as being on the ICU consultant rota or responsibility for leading the ward round, requires local agreement.

SPA time must be recognised with a minimum 1.5 PAs for individual clinician's revalidation requirements.[5] For consultants revalidating in two specialties consideration needs to be given for this to be increased especially where scope of practice has less overlap with ICM clinical practice. Additional SPA allocations need to be recognised within job plans for activities such as educational supervision, or discrete roles in research, management or education, including leadership of such activities, as well as regional and national roles in support of ICM. Important operational supporting activities for ICU services (e.g. overseeing rotas, mortality review, clinical governance, Faculty Tutor) also need to be supported by this process.

The COVID-19 pandemic highlighted many historic staffing concerns, the requirement for sustainable provision of intensive care services[5] and the risk that sustained high levels of stress can pose, leading to burnout and moral

injury to ICU staff. There is increasing recognition of the importance of work life balance to ensure sustainability of the workforce.[1,6] Once established, burnout is difficult to manage, may contribute to depressive illness, and comes at significant cost to the individual and the NHS. The *Critical Staffing* series[2] clearly outlines the change in dynamic of the intensive care workforce, and ways in which staff can be supported to achieve sustainable careers. A good work-life balance and supportive working environment offers some protection, and it is recommended that departments consider a variable job plan that reflects the changing nature of stressful situations by time and individual. ICU leadership, culture, education, working practices, cohesiveness and the ethos of the intensive care team are vitally important determinants of patient outcome and staff wellbeing.

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Recommended Resources

Factsheet: ICU Physician Staffing. Leapfrog hospital survey.

Critical Staffing | The Faculty of Intensive Care Medicine

2.2 Non-Consultant Medical Doctors

Authors: Taqua Dahab, Andrew Davidson, Rosie Worrall

INTRODUCTION

Doctors from different grades of seniority and backgrounds work together as a team on the ICU. This chapter is written for all doctors working on ICU who are not consultants and are referred to in this chapter as ICU doctors.*

The development, education and training for all ICU doctors is essential for delivering high-quality patient care. This chapter however is not a training manual. It is designed to give guidance on the delivery of an intensive care service within a hospital.

It is advised that this chapter be read in conjunction with:

- Chapter 2.4 On-site Medical Doctor and ACCP Rotas
- Chapter 2.16 Professional Development, Training and Education
- Relevant training guidelines and curriculum[1] (for Faculty/College tutors and doctors in training)

MINIMUM STANDARDS

1. Guidelines and resources to support day-to-day ICU practice must be accessible to ICU doctors.
2. All ICU doctors must have a designated educational/clinical supervisor or SAS tutor.[2,3] (see Chapter 2.16)
3. All ICU doctors not in formal training must have an appraiser for revalidation. (see Chapter 2.16)
4. All intensive care training units must have a FICM-appointed Faculty Tutor.[2,4] (see Chapter 2.16)
5. All ICU doctors must have an agreed Personal Development Plan (PDP) relevant and realistic to their developmental needs. (see Chapter 2.16)
6. Doctors in specialty training on the ICU must be provided with the opportunity to fulfil the relevant competences and requirements of their specialty curriculum.[3] (see Chapter 2.16)

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

1. Educational/clinical supervisors, SAS tutors and appraisers should be allocated sufficient time in their job plan to fulfil their role.[2] (see Chapter 2.16)
2. Faculty Tutors should maintain an overview of ICU development, education and training to ensure opportunities are provided to all ICU doctors.[4]
3. Faculty Tutors should perform the Training Capacity Assessment exercise yearly.[5]
4. There should be regular medical teaching for ICU doctors and protected time to attend.[6]
5. ICU doctors should be supported to attend ICU Morbidity and Mortality, governance and quality improvement meetings.
6. Educational Development Time should be designated on the rota as protected time.[7] (see Chapter 2.4 and 2.16)
7. The development, education and training of ICU doctors should be regularly reviewed through a local quality assurance process.[5] (see Chapter 2.16)

BACKGROUND AND EXPLANATION

The FICM Training Capability Assessment encourages Faculty Tutors in ICUs to consider the learning needs of all medical staff and ACCPs, ensuring that learning opportunities are allocated to the most appropriate members of the team during each shift, with priority given to intensivists in training (IiT) and those on the ICM portfolio pathway.[5] (see Chapter 2.16)

Education Development Time needs to be designated on the rota as protected time to allow ICU doctors to pursue activities that support their professional development and training requirements as agreed by their educational/clinical supervisor. This varies according to the background, speciality and grade of doctors. For IiTs, FICM recommends that those in Stage 1 and 2 (or equivalent) have an equivalent of two hours per week, whereas those in more senior grades have four hours per week. This is in addition to study leave allowance. This time will be adjusted pro rata for those in less than full time training and can be flexible in delivery so that an average amount is taken over time.[3] ICU doctors not in formal training will benefit from a locally agreed allocation of EDT.

International medical graduates who are new to UK ICM practice will benefit from the FICM's Induction Pack which provides guidance and support to IMGs with prior ICM experience. IMGs are more likely to experience non-standard outcomes at annual appraisals and often face challenges with postgraduate examinations.[8]

Many locally employed doctors and SAS doctors possess substantial experience, and ICUs greatly benefit from nurturing and developing this staff group. Many may transition to permanent positions and become valuable assets to the intensive care team, enhancing patient care and service continuity.

Departments need to be vigilant in identifying factors contributing to differential attainment among their medical staff from protected characteristics backgrounds.

Several key publications and a range of supportive resources are available to support doctors working in the ICU and their educational/clinical supervisors in meeting their professional development requirements.

- FICM Training Capacity Assessment (2025)
- FICM Guidance for SLE assessors[9] (2025)
- Rotational Training Guidance[10] (2025)
- FICM Best Practice Statements (2024)
- FICM International Doctors in Intensive Care Induction Pack (2024)
- FFICM syllabus[11] (2022)
- FICM guidance statement on EDT[7] (2025)

* Intensive care specialists (non-training doctors with at least 12 years postgraduate training and six years in the relevant specialty), who with local agreement are working on the intensive care consultant rota, are directed to Chapter 2.1: Consultant Staffing.

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2.3 Advanced Critical Care Practitioners

Authors: Carole Boulanger OBE, Kate Allen & Brigitta Fazzini

INTRODUCTION

The Advanced Critical Care Practitioner (ACCP) is now a well-established part of the multidisciplinary ICU team. They are experienced registered healthcare professionals with previous intensive care experience, trained to Masters level, in line with the FICM ACCP Curriculum. They are empowered to make advanced clinical decisions to ensure that patients receive timely, personal and effective care. In many ICUs in the UK, ACCPs work alongside and support non-consultant medical doctors (see Chapter 2.4 On-site Medical Doctor and ACCP Rota).

ACCPs retain their base professional regulator (NMC/HCPC/GphC) and are trained to FICM ACCP membership standards. Their work encompasses the four key pillars of advanced practice: clinical practice, education, research and leadership[1].

MINIMUM STANDARDS

1. ACCPs must act within the formal code of conduct of their present statutory regulator, acknowledging any limitations in their knowledge and skills.
2. ACCPs must work to an agreed scope of practice with clearly defined standard operating procedures and local governance arrangements.
3. ICUs employing ACCPs must ensure the ACCP standard operating procedures are regularly reviewed as part of the unit's governance arrangements.
4. As part of training and ongoing professional development, ACCPs must develop a high level of clinical judgment and decision-making, evidenced by adherence to and meeting the capability portfolio requirements of the FICM ACCP curriculum 2023.
5. ICUs who employ or train ACCPs must have an ICM consultant lead for ACCPs.
6. Trainee ACCPs must practice for two-years in a completely supernumerary capacity within the required structure of the FICM ACCP curriculum and with the appropriate level of supervision[2].
7. ACCPs must meet the requirements of their base professional regulator.
8. Continuing professional development (CPD/appraisal) for ACCPs must be carried out on an annual basis according to FICM CPD/appraisal guidance and which meets revalidation requirements of their base professional regulator[3].

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

Professional Recognition and Management

1. ACCPs should gain FICM ACCP membership.
2. ACCP line management should be a tripartite arrangement between the ICM consultant lead for ACCPs, clinical supervisor and the professional lead from the ACCPs base profession (or lead ACCP where in post).
3. ICUs employing or training ACCPs should ensure working conditions in line with the FICM Sustainable Career Pathway to help to retain senior ACCPs[3,4].

Scope of Practice

4. ACCPs should work autonomously within their scope of practice within a multidisciplinary team led by an ICM Consultant to deliver care to critically ill patients.
5. ACCPs should be independent prescribers whilst working autonomously within scope of practice and within statutory limitations.

Training

6. Employing units should aim to train and/or appoint those practitioners eligible for, or holding, FICM ACCP membership to ensure they practice at a national standard of knowledge base and minimum skillset in meeting the FICM ACCP curriculum capabilities.
7. ACCPs should have dedicated supporting professional activity (SPA) time alongside clinical commitments recognised within their job plan (i.e. 80/20 split) to meet the requirements of the other pillars of advanced practice.
8. ACCPs should be supported, where appropriate, to progress towards completing appropriate Advanced Additional Skills Frameworks[5].

BACKGROUND AND EXPLANATION

Since the role's inception in 2008, the number of ACCPs holding FICM membership has increased. ACCPs contribute to the delivery of intensive care services with appropriate intensive care consultant oversight and work within clear local governance and scope of practice. Since the original FICM ACCP curriculum the national landscape around advanced practice has altered significantly. In England ACCPs come under the umbrella of the Centre for Advanced Practice (NHSE) or equivalent in the devolved nations. All ACCPs are experienced and regulated healthcare professionals.

ACCPs work as part of the multidisciplinary team to meet the needs of critically ill patients supporting intensive care consultants and non-consultant medical doctors. ACCPs can provide the ICU with a consistent point of contact for the multidisciplinary team and support effective inter-professional communication. ACCPs work collaboratively through intensive care caseload and facilitate educational opportunities by their contribution to the service needs of the ICU Medical and ACCP rota. With local agreement, an ACCP with remote supervision from an ICM consultant can provide on-site 24/7 immediate intensive care cover for units. The ACCP role model also offers a career structure and the opportunity to retain senior and experienced staff by remaining clinical while diversifying their profile and skills in education, research, and leadership.

ACCPs contribute to essential unit activities such as governance, education, research, quality improvement projects, policy and guidelines. The FICM ACCP FAQs provides clear guidance on the role in clinical practice.[5] The career pathway for ACCPs offers Advanced Additional Skills Frameworks (AASFs)[6] for extended skills based on local service need. When considering expanding ACCP scope of practice, a local assessment on patient/service needs, safety and impact on medical and other professional training opportunities, can ensure effective consideration of all needs within the department.

Dedicated SPA time is needed alongside clinical commitments within an ACCP job plan, in an 80/20 split. This will additionally require associated study or professional leave to maintain continual professional development (in addition to SPA time) and an associated study budget.

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2.4 On-site Medical Doctor and ACCP Rotas

Authors: Sarah Clarke, Andrew Sharman & Shashi Chandrashekaraiah

INTRODUCTION

The on-site 24/7 rota is organised according to the clinical needs of local ICUs and is covered by Intensivists in Training (IiTs), other resident doctors on training programmes, locally employed doctors (LEDs), specialty and associate specialist (SAS) doctors and advanced critical care practitioners (ACCPs). Patient care within the ICU is led by the intensive care consultant, who serves as the senior decision-maker and holds responsibility for assigning roles to medical and ACCP staff on that shift.

Achievement of the standards below and recommendations will have a beneficial impact on both quality of care and safety for patients and preserve the wellbeing of the workforce.

This is a chapter designed to guide those formulating and delivering the rota. It is important that this chapter is not read in isolation but in conjunction with the following other GPICS V3 chapters: Chapter 1.3 Physical Facilities, Chapter 2.1 Consultant Staffing, Chapter 2.2 Non-consultant Medical Doctors, Chapter 2.3 Advanced Critical Care Practitioners, Chapter 2.16 Professional Development, Education and Training, Chapter 2.17 Staff Wellbeing, and Chapter 2.18 Equity, Diversity and Inclusion.

MINIMUM STANDARDS

1. The rota must comply with any contractual obligations, such as the 2003 Working Time Directive.
2. The staff to patient ratio must not normally exceed 1:8 24/7.
3. All staff included in this rota must have training in basic airway skills.
4. All ICUs must have immediate 24/7 access to staff with a minimum standardised airway skillset.
5. All ICUs must have 24/7 on-site access to staff with advanced airway skills.
6. The rota must be cognisant of fatigue and risk of burnout.
7. Rest facilities, including areas for resting after night shifts, drinks and hot food must be available 24/7.

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

1. Staffing levels should be increased if local arrangements necessitate providing emergency care outside of the ICU (e.g. wards, emergency department, transfers).
2. Leave (both professional and personal) should be acknowledged and, where possible, agreed if requested with a minimum six weeks in advance.
3. The rota should be designed to have appropriate, adequate educational and resource support to aid career development, retention and sustainability.
4. Mandatory specialty teaching attendance time should be protected.
5. Educational Development Time (EDT) should be designated on the rota as protected time.
6. The rota should recognise the need to provide clinical leadership opportunities.
7. The rota should recognise the need for doctors approaching specialist registration to meet their senior training needs.

BACKGROUND AND EXPLANATION

Medical consultants lead the specialty of ICM. Closed units, led by intensive care consultants, have consistently been associated with a reduced intensive care and hospital mortality and length of stay[1,2]. This is maintained by having a dedicated medical and ACCP rota[3-5]. As required in Chapter 2.1 Consultant Staffing, the intensive care consultant on duty must be identified and immediately available.

GPICS V3 recognises that intensive care is a 24/7 service. Variations in caseload, care pathways, availability of different staff groups, educational needs assessments, and local governance agreements will always influence the local implementation of the ICU staffing rota, depending on the skills mix required. The minimum standard for the staff to patient ratio must not normally exceed 1:8 24/7.

All rotas must satisfy any contractual obligations, such as the Working Time Directive and not exceed 48 hours per week. It is expected that the rota will be equitable and transparent, with a stable pattern of clearly defined start

and end times for shifts. A protected meal break is encouraged, along with shorter breaks. It is advisable to avoid scheduling more than four consecutive long shifts to minimise fatigue and burnout, as well as ensuring a suitable period off following any night shifts[6].

It is reasonable for staff to expect that the rota is published at least six weeks in advance. Leave (both professional and personal) should be acknowledged and, where possible, agreed if requested with a minimum six weeks in advance. As technology improves the use of self-rostering software, allowing for flexibility in leave requests, is encouraged.

EDT should be designated on the rota as protected time and pre-rostered to the recommended time advised by the Faculty of Intensive Care Medicine[7,8]. This is separate from other study leave allowance. (See Chapter 2.2 and 2.16)

The rota should recognise the need to provide clinical leadership opportunities, particularly those related to training and as agreed in a Personal Development Plan (PDP). The rota should recognise the need for doctors approaching specialist registration to meet their senior training needs. Examples are time to support maintenance of skills in special interest areas, attend national meetings, visit a specialist ICU not normally part of training, gain management experience or time acting up as a consultant under supervision. Many other examples are listed in the respective curriculums.

For many ICUs, ACCPs are integral members of the intensive care workforce. They are accountable to, as well as supervised by, the intensive care consultant (as detailed in Chapter 2.3). They may contribute to the on-site ICU rota within their defined scope of practice, which will be determined by employers' governance frameworks and individual local service requirements, as healthcare systems adapt to meet the complexities of patient care. It may be helpful for the rota to clearly indicate individuals' roles, so that the team's complementary but distinct contributions are visible and well understood.

A period of supernumerary time on the rota is encouraged for international medical graduates (IMGs) who are new to UK ICM practice (see also Chapter 2.2 Non-consultant Medical Doctors)[9].

Regarding airway skills, it is a minimum standard that all staff on the rota must have basic airway skills and that all ICUs must have immediate access to staff with a minimum standardised airway skills set (see also introduction). For the purposes of GPICS V3 this would be regarded as:

- An anaesthetist in training who has had their Initial Assessment of Competencies (IAC)[10] signed off.
- An intensivist in training who has had IAC sign off or the equivalent of the IAC.
- A doctor practising in the ICU who has completed the IAC or equivalent and is deemed competent by their local ICU.
- An ACCP who has successfully completed the Additional Advanced Skills Framework (AASF)[11] and is deemed competent by their local ICU.

Additionally, all ICUs must have 24/7 access to staff with advanced airway skills i.e., staff who can help manage difficult or challenging airways. This staff member may be the consultant/specialist responsible for the ICU who must be immediately available 24/7 (i.e., continually contactable and, if non-resident, able to attend within 30 minutes).

Wellbeing of the staff affects their physical and mental health (see Chapter 2.17 Staff Wellbeing). ICUs require safe, accessible rest areas for use during the shift that have flat beds or recliner chairs, access to hot food and drinks out of hours, lockers to keep personal belongings safe, sufficient work office/and computers space, dedicated staff car park availability, and accessible rooms for rest after night shifts. Morning handover will ideally be included in the total shift time and checks made on the safety of the night team travelling to their home[12].

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2.5 Registered Nurse Staffing

Authors: Natalie Pattison, Andrea Berry, Claire Horsfield & Nicki Credland
Contributions from the UK Critical Care Nursing Alliance

INTRODUCTION

Nurse staffing requirements for each ICU are determined by the skills, skill mix, and knowledge required to support the patient case mix. Other considerations include additional specialist care requirements, geographical layout of the unit and number of single rooms. Nurse staffing cannot be predicated solely on bed or patient numbers. These standards address specific areas of workforce and reflect nursing dependency requirements rather than patient acuity. It provides a framework around skill mix, educational standards and leadership for a flexible, agile workforce to deliver high-quality care for all critically ill patients and families.

The Adult Critical Care Nursing Career Pathway has been created by the UKCCNA to support workforce development, the purpose being to assist in staff retention, workforce stability thereby providing high quality, safe effective patient care[1]. All ICUs need to be working towards the implementation of the Adult Critical Care Nursing Career Pathway in addition to the individual standards described below.

Applying the minimum standards in isolation is not supported by the evidence. Adhering to all standards will optimise staffing to provide safe and high-quality patient care. Some of the standards and recommendations have additional context; this information can be found in the background and explanation section.

MINIMUM STANDARDS

1. Level 3 patients must have a minimum registered nurse:patient ratio of 1:1 to deliver direct care. (Note 1)
2. Level 2 patients must have a minimum registered nurse:patient ratio of 1:2 to deliver direct care. (Note 1)
3. Each ICU must have an identified intensive care matron/lead nurse (Note 2), dedicated solely to managing intensive care, who has overall responsibility for the nursing elements of the intensive care service[1-4].
4. The matron/lead nurse must hold the same specialist intensive care nurse educational standards as direct care staff providing care to critically ill patients and families[1-3].
5. There must be a clinical shift leader, who is not allocated a patient, on duty 24/7 in all ICUs[1,3].
6. All clinical shift leaders must have completed or be working towards completion of CC3N Step 4 Competencies[5] and hold a post-registration critical care award[3,5].
7. ICUs with more than 10 beds, and each additional 10 beds thereafter, and/or ICUs with large numbers of single rooms, additional infection prevention control requirements or a wide geographical unit footprint, must have at least one additional enhanced critical care nurse who is not allocated a patient[5-7]. (Note 3)
8. There must be no more than 20% of registered nurses from bank/agency, who are NOT substantively employed by the unit, on any one shift[6].
9. Each ICU must have dedicated professional nurse advocates (PNAs) within the establishment, who are given designated time to deliver the role[8,9].

Education

10. A minimum of 50% of registered intensive care nurses must be in possession of a post-registration critical care award[1,10]. (Note 4)
11. Each ICU must have a dedicated supernumerary clinical educator responsible for coordinating the education and training of intensive care staff[1,10].
12. The ratio of clinical educator must equate to a minimum of 1 WTE per 75 registered nurses and non-registered healthcare support workers (headcount)[1,10].
13. Clinical educators must be in possession of post-registration Adult Critical Care Award[3,5], CC3N Step 4 Competencies for Adult Critical Care Nurses[5] and an appropriate post-graduate certificate in education or equivalent[4,5].
14. All novice intensive care nursing staff (staff new to intensive care, including internationally educated nurses) must be allocated a period of 12 weeks supernumerary practice to enable achievement of basic specialist competence[1,5,11]. (Note 5)
15. In preparation for accessing the post-registration Adult Critical Care Course all new staff must complete the CC3N Step 1 Competencies for Adult Critical Care Nurses[5].

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

1. The ratio of clinical educator should equate to a minimum of 1 WTE per 50 registered nurses and non-registered healthcare support workers (headcount)[10].
2. All registered nursing staff supplied by bank/agency should have completed as a minimum CC3N Step 1 Competencies for Adult Critical Care Nurses[5]..
3. All agency/bank staff should be provided with unit orientation.
4. Staff should not be redeployed to the wards from intensive care routinely, but where this is deemed absolutely necessary, best practice guidance needs to be followed[7,12].

BACKGROUND AND EXPLANATION

Additional notes to the minimum standards

Note 1: There needs to be professional judgment and flexibility when applying these ratios to accommodate higher nursing dependency (such as Level 2 patients[13] who might require more than 1:2 nursing care), and it needs to be reviewed on a shift-by-shift basis[1,3,6,7,14,15], and within shift. Additional enhanced critical care registered nurses not allocated to direct patient care will be required in areas with a high number of single rooms (during infection outbreaks, or in surge conditions. This is aligned to the *UKCCNA Workforce Optimisation Plan*. These staff provide essential support for coordination, safety, and escalation, in addition to the clinical shift leader).[7]

Note 2: The identified intensive care matron/lead nurse is expected to be band 8a and above as aligned to the UKCCNA Career Pathway[1].

Note 3: This is in addition to the clinical shift leader and direct care nurses[4]. There is a requirement for one additional enhanced critical care nurse for each multiple of 10 beds (i.e. 11-20 beds =1, 21-30 beds +2, etc.). This nurse will not be allocated a patient and is expected to be a band 6 with a critical care course. It may be considered appropriate to use pod models in ICUs with high numbers of single rooms, so a nurse-in-charge is allocated across a pod area within the footprint[7].

Note 4: Adult Critical Care post-registration courses need to follow the National Standards for Critical Care Nurse Education[5] and include both academic and clinical competence assessment (CC3N Step 2 and 3 Competencies for Adult Critical Care Nurses)[5]. These nurses are regarded as enhanced critical care nurses. The career framework outlined in Appendix 1 of the *UKCCNA Workforce Optimisation Plan and Staffing Standards* recommends that these enhanced critical care nurses are band 6.

Note 5: The supernumerary period can be split over more than one period if required. Following assessment, where staff have transferrable skills, this overall period may be reduced[5].

Staffing Principles

Safe staffing is underpinned by optimal outcomes for patients and for staff[16-18]. A pre-determined number of registered nurses, which is calculated and formula-based, must be rostered to deliver direct care, maximise safety and optimise bed capacity and patient flow[1]. The critical care registered nursing establishment needs to be calculated with sufficient headroom (required to meet planned and unplanned leave) including additional educational/PNAs/sickness/turnover, based on local requirement. RCN and UKCCNA guidance suggest headroom be set at 27-28%[1,2]. The *Adult Critical Care Nursing Career Pathway* addresses skill mix, education and competence required for each role with the nursing establishment[1].

There are clear associations between patient outcomes such as hospital-acquired infection, mortality, hospital costs and family satisfaction, and the level of nurse staffing in ICU[19-21]. Skill mix affects the way in which intensive care nurses manage the organisational complexity of staffing to ensure safety. This in turn is impacted by education, stress, burnout, moral injury and staff turnover. High workloads, lower nurse staffing levels, reduced levels of experience and high proportions of temporary staff are linked with poor outcomes at a patient, staff, and hospital level[7,17-22]. There is some evidence to suggest that having more registered nurses is associated with a positive effect on a range of patient outcomes. Patient acuity and level of care are not predictors of patient dependency, and the nursing care required[14]. The evidence base is expanding, however there are currently no intervention studies to guide deployment of staff in ICU[17].

Overall responsibility for ensuring these standards are met, lies with trust/health board management and executive boards. The optimal configuration of staffing models remains unclear but needs to account for local requirements including skill mix, acuity, dependency and environment factors, such as unit geography and number of single rooms.

These standards account for education requirements, unit context, and skill mix. There are consistent and ongoing

issues with nurse retention, compounded by the COVID-19 pandemic[16]. Optimising a stable, but agile and competent workforce, which can respond to dynamic shifts in patient care requirements, demands high quality skills, effective leadership, and appropriate staffing numbers. They should be read in conjunction with *UK Critical Care Nursing Workforce Optimisation Plan*[1] and the *RCN Nursing Workforce Standards*[2].

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2.6 Registered Nursing Associate Staffing Standards

Authors: Karen Wilson & Nicki Credland
Contributions from the UK Critical Care Nursing Alliance

INTRODUCTION

The Registered Nursing Associate (NAR) is a new role in intensive care. NARs hold a position on the Nursing and Midwifery Council (NMC) register allowing direct patient care under the supervision of a registered nurse (RN)[1,2,3].

The role of the NAR is assistive[4] and focused on augmenting care delivery. NARs are a valuable part of the intensive care nursing team however, they are not a replacement for the RN role[5]. These GPICS standards provide a framework to support the utilisation of NARs in intensive care.

Applying only some of the minimum standards below in isolation is not supported by the evidence. Therefore, all minimum standards must be adhered to, to optimise the role of the NAR in intensive care. These standards are to be used in conjunction with the standards set out in Chapter 2.5 Registered Nurse Staffing.

MINIMUM STANDARDS

1. NARs must work within their scope of practice as defined by the Nursing and Midwifery Council[2].
2. NARs provide an assistive function and must not be responsible for planning, evaluating or leading care[6].
3. NARs must not be used to replace RN roles (including registered and unregistered nursing assistive roles) and only support RNs to deliver direct care[2,4,5].
4. No more than 10% of the intensive care nursing workforce must be non-registered Health Care Support staff (including NARs) as a proportion of direct care nursing staff[7].
5. NAR supervision must be provided by the additional enhanced critical care RNs not directly allocated to patient care in units with greater than 10 beds; in units with less than 10 beds this will need to be agreed locally.
6. NARs must complete the National Critical Care Nursing Associate Competences.
7. All staff performing assistive nursing roles must receive appropriate training and undergo competence assessment[8,9].
8. The supernumerary period for an NAR commencing employment in intensive care must be a minimum of 12 weeks.

BACKGROUND AND EXPLANATION

In 2015, a Health Education England commissioned report *Raising the bar: Shape of Caring*; recommended that a new role was created to bridge the gap between health care support workers and RNs[10]. This resulted in the creation of the NAR role. The first NARs were registered by the NMC in 2019. This role was intended to enable wards/units to "grow their own" and provide an alternative route into the nursing profession. The NAR role is an assistive role to support RNs in care delivery and is not a substitute for the RN workforce[5]. NARs work as part of the multidisciplinary team to augment care delivery by RNs[11].

NARs are registered by the NMC following completion of a two-year foundation degree. The NMC provides the framework and standards to which NARs are required to comply. These standards have six platforms of proficiency as opposed to seven standards for RNs[1,2,3]. Whilst RNs can plan, provide and evaluate care, the NAR role is to provide and monitor care. The responsibility and overall accountability for assessing, planning, and evaluating care always rests with the RN[1,2,3].

Care delivery within the intensive care environment is highly complex and requires dynamic risk assessment. RN supervision is essential to ensure that NARs work within their scope of practice. Provision of this supervision cannot impact on the care of intensive care patients and recommended intensive care RN:patient ratios has to be maintained[7]. There is significant evidence that degree level RNs are associated with a positive effect on a range of patient outcomes[12]. Similarly, low RN staffing levels have been linked to increased omissions in care[8]. Therefore, there needs to be careful consideration of the ratio of NARs to RNs on each shift. Best practice guidelines and Critical Care Nursing Associate competencies have been developed to assist NARs in intensive care to work within their defined scope of practice[14,15]. Careful consideration in the allocation of patients is also required by the intensive care shift coordinator.

Additional research is needed to determine the impact of the NAR role within intensive care on patient outcomes. Understanding the differences in scope of practice and the impact that this has on the professional boundaries between NARs and RNs working in intensive care is also needed[9].

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2.7 Pharmacy Team

Authors: Fraser Hanks & Mark Borthwick
Contributions from FICM Pharmacist Committee, Intensive Care Society Professional Advisory Group (PAG), and devolved health administration intensive care pharmacy leaders.

INTRODUCTION

Pharmacy teams include pharmacists, pharmacy technicians, and pharmacy assistants, and are essential ICU team members[1]. Integration of pharmacists into the ICU team reduces patient mortality, ICU length of stay, and adverse drug events, while reducing costs[2–8], particularly through ward round attendance[2]. ICU pharmacists and pharmacy technicians deliver patient-centred medicines optimisation[9]. Core clinical pharmacy services include intensive care admission/discharge, medicines reconciliation, and medication review[1].

Pharmacy teams deliver additional professional support activities such as guideline development and implementation, clinical incident investigation, education, research and audit delivery. They ensure compliance with mandated medicines management standards[10], timely medicines supply, financial reporting and commissioner reimbursement.

MINIMUM STANDARDS

1. There must be a designated intensive care pharmacist(s) for every ICU.
2. Core clinical pharmacy services must be delivered to intensive care seven days a week.
3. There must be a minimum 0.14 WTE pharmacist for every intensive care bed[11,12].
4. Intensive care pharmacist(s) must be available five days a week.
5. Intensive care pharmacist(s) must attend daily multidisciplinary ward rounds on weekdays (excluding public holidays).
6. The most senior pharmacist(s) within a healthcare organisation who works with critically ill patients on a daily basis must be able to demonstrate advanced level intensive care pharmacist practice.
7. Other clinical pharmacists who provide a service to intensive care areas must have the minimum competencies to allow them to do so.
8. Other clinical pharmacists who provide a service to intensive care must have access to an advanced or consultant level intensive care pharmacist for advice and referrals.

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

1. There should be intensive care pharmacist(s) available seven days a week.
2. Intensive care pharmacists should undergo an independent, recognised process to verify competence level.
3. There should be sufficient patient-facing pharmacy technical staff for medicines management activities (clinical and non-clinical), and other supporting activities.
4. Job plans for senior permanent staff members should be in place to ensure appropriate prioritisation across all pillars of practice.
5. Senior specialist intensive care pharmacist support should be accessible within the healthcare organisation.
6. Where a team of intensive care pharmacists is in place, there should be a structured range of expertise, from foundation to consultant level.
7. Peer-to-peer practitioner visit(s) should occur at least once a year to ensure training issues are identified and to help maintain the competence of small teams and sole workers.
8. There should be sufficient pharmacy assistant staff to support medicines supply, and to support intensive care nursing staff with non-clinical management and supply activities.

BACKGROUND AND EXPLANATION

Complex, dynamic and personalised medication plans are essential to account for the rapid pharmacodynamic and pharmacokinetic changes that occur during critical illness. Intensive care pharmacy teams optimise medication use, manage high risk medication in a high-pressured clinical environment, using evidence-informed decision making. ICU pharmacists in the ICU multidisciplinary team encourage professional collaboration, improve clinical outcomes, and reduce costs[2–8].

The PROTECTED-UK study clearly shows proactive pharmacist medication reviews result in medicines optimisation or error correction for one in every six prescribed medicines[13]. Where weekend services were provided, the contribution rate was double that of weekdays[14]. Such medicines optimisation by ICU pharmacists is associated with reduced

patient ICU length of stay and mortality[15]. Experienced/specialist pharmacists made contributions with higher clinical impact than more junior team members[13]. Additionally, national guidelines direct medicines reconciliation to occur within 24 hours of hospital admission, or when patients move clinical setting[16-17].

The WTE ratios described above are based on a standard 37.5-hour week of pharmacist time dedicated to ICU activities. Intensive care pharmacists may have additional non-ICU duties, these roles need to be clear in job planning and do not count towards the ICU WTE figure. Service continuity uplifts (headroom) ensure the intensive care pharmacy service remains viable, regardless of the size of ICU, and to allow for planned/unplanned leave. Job plans for intensive care pharmacists should be in place to ensure appropriate prioritisation across all pillars of advanced pharmacist practice and revalidation requirements. Dedicated supporting professional activity (SPA), additional NHS responsibilities (ANR), and external duties (ED) needs to be considered.

Smaller pharmacy teams are particularly vulnerable to the competing demands of the wider pharmacy department. Other clinical pharmacists who provide a service to intensive care areas must have the minimum competencies to allow them to do so and must have access to an advanced or consultant level intensive care pharmacist for advice and referrals. Competency can be assessed and assured by the advanced or consultant level intensive care pharmacist according to local context.

It is important that senior specialist intensive care pharmacist support is provided and accessible within the healthcare organisation. Alternative arrangements to access support via intensive care networks, health boards, or other regional structures may be required, particularly for small and/or remote organisations. Additional time required for support needs to be accounted for within job plans.

The pharmacy core advanced curriculum[18], specialist intensive care pharmacy curriculum[19], and credentialing program provides an independent method for assessing pharmacist competency at advanced or consultant level. Credentialling of consultant level practitioners is mandatory, though to date advanced level credentialing is voluntary[20]. It remains the responsibility of chief pharmacists (or equivalent) to ensure pharmacists are competent for their role. Peer-to-peer practitioner visit can identify training issues and to help maintain the competence of small teams and sole workers. This supports General Pharmaceutical Council (GPhC) revalidation, and Pharmaceutical Society of Northern Ireland (PSNI) continuing professional development.

Pharmacy technicians and assistants add resilience to medicines management processes, releasing clinical pharmacist and nursing time for medicines optimisation and direct patient care[1]. Pharmacy technicians and assistants provide medicines reconciliation, medicines management, financial reporting, reimbursement and audit. It is suggested that roles for these staff groups be developed widely in line with workforce strategies[1].

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2.8 Physiotherapists

Authors: Gareth Cornell, Clair Martin & Paul Twose

INTRODUCTION

Physiotherapy is an integral component in the multidisciplinary management of critically ill patients admitted to intensive care, providing both respiratory management and holistic rehabilitation.

The role of physiotherapy and physiotherapy services continue to adapt and innovate to meet the needs of the patients and their families. The importance of personalised, patient centred care remains paramount, and is demonstrated through utilisation of increasingly advanced diagnostic and interpretation skills to inform and adapt interventions (both respiratory and rehabilitation), ensuring maximal value and benefit. There is also increasing awareness of the importance of physiotherapy contribution both within and beyond intensive care to multiprofessional education, governance, risk and assurance, quality improvement, and research, all with a focus on improving patient outcomes and experience.

MINIMUM STANDARDS

1. ICUs must have access to a physiotherapist covering all aspects of intensive care (including respiratory and rehabilitation services, and contributions to the multidisciplinary coordination of care) five days per week[1,2].
2. There must be emergency access to 24-hour respiratory physiotherapy.
3. The physiotherapy service in each ICU must have operational policies detailing core standards and a framework for effective management of safety, risk and quality.
4. All ICUs must have a recognised lead physiotherapist with at least an enhanced level of practice accountable for safety, quality, governance, training, and mentorship.
5. A workforce development plan must be in place which encompasses all registered and physiotherapy support staff working within intensive care.
6. Physiotherapy staff must have support to meet the requirements of their role and meet professional and regulatory CPD requirements.
7. Intensive care physiotherapists must utilise the ICS AHP Capability Framework, to track and guide professional development, working across the four pillars of practice[3].
8. Physiotherapists must be involved with non-direct patient facing roles within the ICU service delivery including, training and any relevant clinical guideline development, clinical governance and morbidity and mortality meetings.
9. Physiotherapy staff must attend ICU patient care MDT meetings.

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

1. There should be a minimum of 0.25 WTE registered physiotherapist per ICU bed.
2. At least 30% of the registered physiotherapy workforce should be operating at enhanced level of practice or higher.
3. Physiotherapy services should provide assessment and intervention for patients requiring rehabilitation seven days per week.
4. The physiotherapy intervention(s) as part of the patients individualised rehabilitation plan, should be matched to the acuity, dependency and complexity of the patient, considering the patients clinical needs and tolerance to interventions.
5. All organisations should explore the need for physiotherapy roles working at consultant or advanced level of practice.
6. Physiotherapy services, either independently or in conjunction with other nursing and AHP services, should take proactive steps to maximise the utilisation of rehabilitation/therapy support workers and assistant practitioners across the intensive care pathway, utilising apprenticeships, and other training paths to support this.
7. Physiotherapy services, either independently or in conjunction with medical, nursing and other AHP services, should create evidence-informed clinical guidelines and standard operating procedures for common physiotherapy patient needs.
8. The lead physiotherapist, or appropriate deputy, should actively participate in all relevant local, and where appropriate regional, intensive care leadership forums and structures.
9. Physiotherapy services should consider roles dedicated to supporting the training and development of core ICU physiotherapists and those fulfilling emergency out of hours work[4].

BACKGROUND AND EXPLANATION

As an integral part of the intensive care multidisciplinary team, physiotherapists provide specialist assessment and intervention as part of a holistic approach to patient care. Physiotherapy provision has to appropriately align to the nature and demands of the local intensive care service(s) as well as local population needs, across the breadth of the intensive care pathway, including follow-up services.

Respiratory physiotherapy remains a major focus for both the spontaneously breathing and mechanically ventilated patient. Whilst airway secretion clearance, optimisation of lung volumes, ventilation and respiratory function remain core to practice[5], physiotherapists are increasingly involved in the development of ventilator and tracheostomy weaning plans[6,7]. The availability of 24-hour respiratory physiotherapy may occur through a range of service models and arrangements.

Recent literature continues to support the delivery of physical rehabilitation to prevent or reduce the debilitating effects of critical illness. This includes focus on duration and intensity of intervention[4], as well as innovative approaches to delivering rehabilitation services outside of usual working hours[2]. Physiotherapists are increasingly involved in the provision of follow-up services for patients including intensive care recovery clinics and post hospital rehabilitation programmes[2]. The physiotherapy intervention(s) as part of the patient's individualised rehabilitation plan, which should be matched to the acuity, dependency and complexity of the patient, considering the patient's clinical needs and tolerance to interventions. This may include provision of rehabilitation services outside of traditional working hours and should be evaluated for value and effectiveness.

Across the UK, significant variance exists with how physiotherapy services are structured and provided to intensive care. National recommendations relating to physiotherapy staffing have been available for over 10 years, however few ICUs manage to achieve these, emphasising ongoing challenges to how physiotherapy services are commissioned and resourced[6,8,9]. The impact of non-compliance is yet to be determined although it could be a focus for future research, and must consider multiple factors such as the acuity, complexity and diversity of the patient case-mix, skill mix of the physiotherapy team and service structure.

Current workforce development plans are expected to include capability proformas which reflect relevant professional development frameworks; an appropriate local training and development programme; supervisory and appraisal framework; job plans and annual training needs analysis.

Future research needs to consider utilisation of therapy support workers or rehabilitation assistants to aid in the development of staffing recommendations. There is clearer evidence to promote services ensuring physiotherapy staff are appropriately job planned to have primary responsibility to intensive care services. This has been shown to increase both clinical and non-clinical activity, including involvement in strategic planning, governance, and research[8].

Whilst no national post-registration competency framework or curricula exists, the development of the *ICS Physiotherapy Pillar* provided guidance on expected levels of practice from novice to consultant level practitioner. There are recognised structures, processes and resources in place that support learning and development in the workplace and enable individuals to meet the requirements of their role and meet professional and regulatory CPD requirements. This has been further enhanced by the implementation of the *ICS AHPs in Critical Care Capability Framework*[3].

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2.9 Dietitians

Authors: Ella Terblanche MBE & Danielle Bear

INTRODUCTION

The provision of nutrition support to patients on the ICU is complex with many requiring enteral and/or parenteral nutrition to meet their nutritional needs[1,2]. The risk of malnutrition in these patients is high, independent of the route of nutrition (oral, enteral and/or parenteral), the dietitian is best placed to provide nutritional advice to the multidisciplinary team and patients in ICU on the optimal way to manage nutritional needs[3,4].

MINIMUM STANDARDS

1. ICUs must have access to a dietitian five days a week[5,6].
2. If the intensive care dietitian is working alone, they must be at an enhanced level[7].
3. Where more than one dietitian is required, there must be an identifiable lead dietitian at enhanced or above level to ensure an appropriate range of expertise within the team and to have overall responsibility for the service provision.
4. Intensive care dietitian(s) must utilise the *ICS AHP Capability Framework*, to track and guide professional development, working within the four pillars of practice[8].
5. Intensive care dietitian(s) must attend ICU patient care MDT meetings.
6. Intensive care dietitian(s) must have regular communication with the consultant where nutritional goals, risks and plans are discussed[9].
7. Intensive care dietitian(s) must lead on the development and implementation of any local nutrition support guideline(s) and protocols[8].
8. Intensive care dietitian(s) must contribute to appropriate strategic meetings and clinical governance activities, including leading regular nutrition-related audits and quality improvement projects.
9. Intensive care dietitian(s) must provide a structured handover to a ward dietitian when patients are discharged from the ICU, considering nutrition-related morbidity as per the NICE Quality Standard[10].

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

1. There should be a minimum of 0.1 WTE dietitian per intensive care bed.
2. Intensive care dietitian(s) should provide ongoing education and training for other healthcare professionals.
3. Intensive care dietitian(s) should consider gaining extended skills such as inserting feeding tubes, using indirect calorimetry to determine energy expenditure and/or non-medical supplementary prescribing.
4. Intensive care dietitian(s) should participate in any nutrition related research activity.
5. Intensive care dietitian(s) should be a member of a national or international professional support group.

BACKGROUND AND EXPLANATION

Malnutrition leads to poor outcomes in the critically ill[11], highlighting the need for a dietitian to be a core part of the multidisciplinary team[3]. International guidelines recommend an individualised nutritional strategy after the first few days in ICU[1] with dietitians personalising nutrition in partnership with clinicians, patients and carers[2]. Additionally, dietitians ensure ongoing monitoring, develop and implement nutrition guidelines, contribute to education and may also undertake extended roles such as inserting feeding tubes[4]. Given the expertise and complex decision-making skills required for the safe nutritional care of critically ill patients, any dietitian leading care or working alone must have enhanced clinical practice capabilities.[7,8]

Evidence suggests that having a dietitian as part of the ICU multidisciplinary team rather than relying solely on feeding protocol has multiple patient benefits including earlier initiation of enteral feeding, increased nutrition delivery, and reduced use of inappropriate parenteral nutrition[12-14]. Dietitian designed and implemented protocols lead to a reduction in constipation, diarrhoea and Clostridium difficile infections[15].

Extended roles for dieticians are becoming common. Clear benefits include: minimising enteral feeding delays, avoiding x-rays and endoscopy referrals and efficient and timely prescribing of parenteral nutrition. This may result in cost savings[16]. Additional benefits are avoidance of over and underfeeding with indirect calorimetry[12], vitamins and minerals, and pancreatic enzyme therapy from non-medical supplementary prescribing[17] potentially leading to fewer medication errors.

Patients frequently experience nutrition-related morbidity on discharge from the ICU such as malnutrition, changes in eating patterns, poor or excessive appetite and dysphagia[18]. NICE CG839 states that nutrition goals are set with the patient. In addition, a structured handover must be provided on discharge from ICU to the ward in line with the NICE quality standard for rehabilitation after critical illness[10].

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2.10 Speech and Language Therapists

Authors: Sarah Wallace OBE & Susan McGowan

INTRODUCTION

Patients in intensive care frequently have difficulties with communication, swallowing and weaning[1-4]. Timely access to Speech and Language Therapy (SLT) promotes humanisation of care, patient well-being, and functional recovery[5,6]. Early SLT intervention supports communication, voice restoration and swallowing rehabilitation[4,7,8]. Assessment and management of dysphagia, including using instrumental tools such as FEES (Fibreoptic Endoscopic Evaluation of Swallowing) identifies laryngeal dysfunction, guides timing of safe oral intake, and informs ventilator and tracheostomy weaning plans[2,3,4,9,10]. SLT input prevents nutritional and respiratory complications from undiagnosed dysphagia[11,18] and adverse psychological effects associated with an inability to communicate[5].

MINIMUM STANDARDS

1. ICUs must have access to an SLT five days a week.[8-10]
2. All patients with a tracheostomy must be referred to SLT at the point of sedation hold for assessment of communication and swallowing needs.[8,10]
3. SLTs must have the competency and capability to assess, manage and treat complex dysphagia and communication impairments, including patients with tracheostomy tubes, in the ICU environment.[9,10,13,14]
4. Where more than one SLT is required, there must be an identifiable lead SLT at enhanced or above level to ensure an appropriate range of expertise within the team and to have overall responsibility for the service provision.
5. SLTs must utilise the *ICS AHP capability framework* and the Royal College of Speech and Language Therapy (RCSLT) competency documents, to track and guide professional development.[13,14]
6. FEES must be available for SLTs to use in ICU for the assessment and management of laryngeal dysfunction, secretion management and dysphagia.[3,4,8-10,13,14]
7. SLTs must provide communication swallowing and upper airway functional goals for the rehabilitation prescription and medical handover at step-down and throughout recovery.[9,10,12,13-15]
8. SLTs must attend ICU patient care MDT meetings.[6,8-10,12]
9. SLTs must contribute to ICU ward rounds, tracheostomy teams, follow-up clinics, training, and any relevant clinical guideline development, clinical governance and morbidity and mortality meetings.[6,8-10,12,13]
10. SLTs must contribute to tracheostomy and/or ventilation weaning plans for those patients who have communication, swallowing and/or upper airway functional impairment.[4,6,8-10,13,14]

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

1. There should be a minimum of 0.1 WTE SLT per ICU bed.
2. SLTs should advise staff, patients and patients' family/friends on communication strategies and aids to facilitate effective communication.[1,4,5,7-10,14,17,19]
3. SLTs should provide education to the team on ICU specific manifestations of communication disorder and dysphagia and the impact these have on weaning.[1,3,4,6,10,14]
4. SLTs should participate in any relevant collaborative audit or research activity.[10,13,14]
5. The lead SLT, or appropriate deputy, should actively participate in all relevant local regional and national critical care networks and forums.

BACKGROUND AND EXPLANATION

The presence and recognition of the contribution of SLTs in ICU has increased since the inception of GPICS [4,8,9,13,15]. The minimum recommended staffing level of 0.1 WTE SLT per intensive care bed care reflects the continuing need to provide frequent intervention in line with the reported prevalence of dysphagia (up to 93%)[1-4,11,17], dysphonia (76%)[2,4,12,15] and other communication problems in patients with critical illness.[5,7,16] ICUs with complex patient cohorts may require a much higher WTE.

Communication and swallowing difficulties arise due to underlying and presenting medical conditions (e.g. COPD, sepsis, ARDS), concomitant conditions (e.g. neuromyopathy of the swallowing muscles) or the presence of equipment/technologies used to support life (e.g. intubation, tracheostomy or ventilation)[1-4,17]. Problems frequently persist as a part of Post Intensive Care Syndrome necessitating ongoing SLT management and rehabilitation[16].

Early SLT assessment provides diagnostic and prognostic indicators of communication and swallowing recovery, informs ventilator and tracheostomy weaning, and identifies targeted therapy[1,4,7,10,11,16,18]. Prompt intervention also prevents the negative impact of dysphagia on nutrition and respiration[1,4,6,17,18]. SLT-led FEES detects laryngeal oedema, vocal fold immobility and glottic insufficiency, and informs airway protection including the actual risks of aspiration, airway patency, safe oral feeding, and voice[3,4].

SLTs promote early voice restoration[4,5,7,16] through Above Cuff Vocalisation[4,7,18] and one-way valves[4,7,16], and facilitate patient communication through low and high-tech communication aids[4,7,9]. SLT intervention mitigates anxiety, supports detection and management of delirium, supports patient participation in decision making, communication of choices and enables participation in rehabilitation[4,6,7,9,18].

Working as an embedded member of the ICU multidisciplinary team improves outcomes, reduces weaning times and length of stay and is upheld by national guidance[6,8,9,11,18]. SLTs are currently well placed to collaboratively develop ICU services, actively identify and contribute to research and audit and continue to develop innovative clinical interventions[10,14,16,18].

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2.11 Occupational Therapy

Authors: James Bruce, Claire Rock & Samantha Eperson

INTRODUCTION

Occupational therapy (OT) in the ICU involves the assessment and treatment of patients with acute and critical illnesses. It focuses on supporting patients to engage in purposeful activity to improve physical, cognitive and emotional function and helping them return to their daily activities.

Current guidelines recommend the OT role in supporting post intensive care recovery including managing the impact of impairments or disabilities to restore function and improve independence. Rehabilitation needs to be multidisciplinary, supporting patients to achieve their individualised goals, by maximising recovery of physical, cognitive and psychosocial functions to improve quality of life.[1]

MINIMUM STANDARDS

1. ICUs must have access to an OT five days a week[2].
2. All OTs working in ICU must utilise the *AHP Capability Framework*, to track and guide professional development, working within the four pillars of practice[3].
3. There must be a designated lead OT working at an enhanced level (or above), accountable for ICU service provision, workforce and professional development.
4. OTs must complete a needs-based assessment using holistic measures of health and disability including activities of daily living in ICU.
5. OTs must be able to assess and contribute to non-pharmacological treatment options for patients who present with delirium in line with the P.A.D.I.S. guidelines (pain, agitation, delirium, immobility and sleep)[4,5].
6. OTs must have time in their job plan to attend ICU patient care MDT meetings.
7. OTs must be involved with non-direct patient facing roles within the ICU service delivery including training, relevant clinical guideline development, clinical governance and morbidity and mortality meetings[6].

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

1. There should be a minimum of 0.15 WTE OT per ICU bed[4,7,8].
2. The OT service should aim to deliver a seven-day service for intensive care patients.
3. OTs should be involved in post intensive care unit recovery services[2].
4. The lead OT should be responsible for supporting learning opportunities, training and clinical supervision for junior staff providing OT services in intensive care.
5. OTs should be involved in research and development.
6. OTs should be linked with local and national critical care networks.

BACKGROUND AND EXPLANATION

In the UK 59.1% of ICUs have provision of OT and 36.5% have ICU ring-fenced OT provision[6]. OT can reduce sedation use, potentially decrease delirium, support rehabilitation, and potentially decrease intensive care and hospital lengths of stay; however, business cases are declined year after year[10]. Poor understanding of the role and benefits of OT can lead to underutilisation and detriment to patients[7].

OT specific roles include assessment of function; mood and engagement; early discharge planning; rehabilitation maintenance of joint range; seating assessments; sensory assessments; occupation assessment and intervention for mental health needs; assessment of cognition and delirium management[11,12].

The effectiveness of OT for managing delirium in non-mechanically ventilated patients was shown in a RCT by the introduction of daily 40-minute sessions twice a day with significant improvements in delirium presentation and cognitive ability[4].

A paper published in 2023 highlighted that physical and occupational therapy can benefit patients in the ICU, improving their mobility, independence with self-care, and decreasing their length of stay (>30 minutes of therapy resulted in benefits of function in the ICU population)[9].

Non-direct roles suggest only half of the ring-fenced staff attended multidisciplinary ward rounds; 11% engaged in research; and 10% were involved in business processes regarding their unit management. The OT exposure was the lowest of the four disciplines examined (compared to physiotherapy, dietetics and speech and language therapy)[6].

The *ICS AHP Capability Framework* will guide and support the development of the four professional pillars of practice, across six levels of practice, giving OTs a clearly defined career pathway within this specialty[3]. More research around the ICU OT role is required to support the role development.

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2.12 Practitioner Psychologists

Authors: Dorothy Wade, David Howell & Julie Highfield

INTRODUCTION

The psychological impact of critical illness may be severe, with 40-60% of patients experiencing distress and 50-80% developing delirium during their admission to an ICU[1,2]. Around 50% also experience psychological difficulties including anxiety, depression or post-traumatic stress after hospital discharge[3].

The core role of practitioner psychologists (clinical, health or counselling psychologists registered with the Health and Care Professions Council) is to promote the psychological health of critically ill patients during their ICU admission and subsequent recovery period.

The standards and recommendations in this chapter are drawn from NICE clinical guideline CG83[4] and quality standard QS158[5] on Rehabilitation after Critical Illness in Adults; and Guidance for the Integration of Practitioner Psychologists in Intensive Care from the Intensive Care Society[6].

MINIMUM STANDARDS

1. ICUs must have access to practitioner psychologists.
2. Where integrated practitioner psychologists are present, they must be embedded within intensive care multidisciplinary teams to address the psychological health needs of patients and their families/loved ones[6].
3. Where integrated practitioner psychologists are present the most senior practitioner psychologist must be part of the intensive care leadership team, to advise on systemic issues influencing staff wellbeing.
4. All patients in ICU must be screened for psychological distress[5].
5. Patients with psychological distress in ICU must be triaged to receive psychological interventions as appropriate.

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

Staffing

1. ICUs should have access to practitioner psychologists five days a week.
2. There should be a minimum of 0.1 WTE practitioner psychologist per intensive care bed[6].
3. Practitioner psychologists should be integrated into the ICU.
4. A small to medium sized unit (up to 20 beds) should be led by a grade 8b practitioner psychologist.
5. For larger units (more than 20 beds), or those with multiple sites, an 8c consultant psychologist should lead, with support from qualified psychologists at lower bands (7-8b).

Screening/assessment

6. Patients should receive assessments for psychological difficulties throughout the intensive care pathway as specified by NICE QS 1585 and ideally delivered or supervised by qualified practitioner psychologists.

Interventions in the ICU

7. Practitioner psychologists should provide evidence-based interventions for patients who have been assessed as at-risk of psychological morbidity.
8. Practitioner psychologists should also work indirectly, by offering advice and consultation to other ICU staff about psychological issues that arise in these colleagues' clinical work.
9. Practitioner psychologists should offer short term family support with a view to supporting decision making and signposting families to appropriate psychological services in the community.
10. Practitioner psychologists should be involved in education, research and QI projects to improve psychological understanding and care in the ICU.

Post-ICU interventions

11. ICU practitioner psychologists should contribute to post ICU rehabilitation and recovery services.

BACKGROUND AND EXPLANATION

The value of the practitioner psychologist role in ICU has received increased recognition and been further developed since the first version of GPICS[7]. With the rapid incorporation of practitioner psychologists into ICUs in the UK, the Intensive Care Society produced guidelines to support their integration[6]. This revised GPICS chapter aligns with those guidelines, which were also endorsed by the British Psychological Society. NICE guidelines on delirium[8], patient experience in hospital[9], anxiety, depression and post-traumatic stress disorder [10] underpin the development and provision of psychological assessments and interventions for ICU patients.

Regarding assessment in the ICU, validated measures such as the Intensive Care Psychological Assessment Tool[11]) or PICUPS tool[12] are recommended. ICU psychologists can support psychologically informed management of delirium, and provide direct psychological interventions to patients for distress, early trauma, low mood or anxiety. They aim to help patients to cope with illness and ICU admission.

The Faculty for Intensive Care Medicine's report on Life after Critical Illness[13] also emphasises the need to integrate practitioner psychologists into post-intensive care settings. The post-ICU psychology role includes producing information resources; participating in follow-up reviews for patients and families; providing evidence-based therapies for difficulties such as anxiety, depression, post-traumatic stress or cognitive impairment; and/or making onward referrals to other specialist services.

The new standards and recommendations assert the need for sustainable ICU psychologist roles, and for assessments and interventions for patients to be recognised as the key priority of practitioner psychologists embedded in multidisciplinary ICU teams.

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2.13 Healthcare Scientists Specialising in Intensive Care

Authors: Stefanie Curry, Michal Pruski, Antonio Rubino & Dave Edwards

INTRODUCTION

The healthcare science workforce is at the forefront of the NHS[1]. Critical care scientists/technologists (CCS) have specialist knowledge of scientific and technical principles, with application to advanced physiological monitoring and direct patient care within the intensive care setting. As part of a multidisciplinary team delivering care to critically ill patients, CCSs work to support advanced clinical practice, development of clinical services and adoption of new technologies in response to scientific research and innovations[1]. In this way, CCSs deliver the commitments of the NHS Constitution and support service improvement to ensure a sustainable NHS.

In Wales, operating department practitioners are recognised as healthcare scientists.

MINIMUM STANDARDS

1. Critical care scientists must comply with the professional standards of behaviour and practice set out in Good Scientific Practice (GSP)[1].
2. Critical care scientists responsible for management of medical devices and point of care diagnostic services must comply with the standards set by the Medicines and Healthcare Products Regulatory Agency (MHRA)[2] and the International Organisation for Standardisation (ISO) standard (22870:2016)[3].
3. Critical care scientists voluntarily registered with the Health and Care Professions Council (HCPC) must meet the Standard of Proficiency[4] and comply with the Standards of Conduct, Performance and Ethics[5].
4. ICUs receiving trainee healthcare scientists for training in intensive care must comply with the requirements for training set for them by the National School of Healthcare Scientist (NSHCS)[6].

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

1. Critical care scientists should successfully complete an approved training programme, either via accredited specialist training or as part of the Scientist Training Program (STP) commissioned by the National School of Healthcare Science (NSHCS).
2. Critical care scientists should be registered with the HCPC.
3. Critical care scientists should work collaboratively to be a dynamic member of the multidisciplinary team.
4. Critical care scientists should provide advice to medical, nursing, and wider multidisciplinary team about the safe and effective use of medical devices used within the intensive care environment.
5. Critical care scientists should develop and support research activities.
6. Critical care scientists should provide effective management and support for medical devices, including advising on optimal clinical settings and troubleshooting, resulting in focused, efficient, and high-quality care.
7. Critical care scientists should contribute to the educational needs of the multidisciplinary team.
8. Critical care scientists should demonstrate flexibility and adaptability to work across diverse pathways of patient care and clinical services that are both routine and highly specialised.
9. Critical care scientists should work safely and effectively within their scope of practice and ensure they do not practise in areas where they are not proficient.
10. As part of the multidisciplinary team, critical care scientists should contribute to the strategic direction, planning and delivery of intensive care services.
11. Critical care scientists should engage with the Society of Critical Care Technologies (SCCT) as their professional body to work in collaboration with the Academy for Healthcare Science and the NSHCS.

BACKGROUND AND EXPLANATION

Healthcare scientists comprise approximately 5% of the total healthcare workforce across the NHS in the United Kingdom, with more than 60,000 healthcare scientists employed in over 50 different scientific specialisms[6]. In their specialist roles, healthcare scientists undertake complex scientific and clinical roles, defining and choosing investigations, making key judgements about complex facts, and providing specialist knowledge in clinical situations[1]. As a result, approximately 80% of all diagnoses across the NHS can be attributed to the work of healthcare scientists[6]. The CCS workforce was modernised as part of an initiative led by the NSHCS to plan for a future workforce with the

right skills and behaviours to deliver high-quality patient care. This led to the establishment of the Scientists' Training Programme (STP) to ensure CCSs were educated and trained to meet the challenges of modern healthcare[6]. A structured clinical training programme and careful supervision ensure trainees and qualified CCSs never work outside of their competencies and are always consistent with patient safety.

The output from these master's level STP and accredited specialist training programmes are relevantly trained CCSs who can work across traditional professional demarcations, with flexible skills and the ability to adapt and innovate[6]. *Good Scientific Practice* sets out the principles, values and the standards of behaviour and practise for the whole healthcare science workforce, which has demonstrated a high calibre of work and has a positive impact in raising standards and enhancing the quality of patient care. To ensure that quality is placed at the centre of healthcare science delivery, CCSs play a central role in safe and effective patient care by ensuring information dissemination and by ensuring innovative scientific and technological advances are translated into models of integrated care for improved patient outcomes. Working directly with the medical, nursing and allied health professionals in intensive care, the CCS can enhance delivery of highly technical patient care. This benefit is most apparent when the CCS can apply specialist knowledge of technology and scientific processes to directly support the intensive care team. In this way, the CCS facilitates effective diagnosis, therapy, monitoring, rehabilitation, and risk management. To help meet the standards of the Care Quality Commission[7] and to ensure healthcare organisations comply with the Medical Devices Regulation[2], CCSs can help optimise cost, risk, and performance of medical devices by addressing strategies for appropriate use of medical devices and development of local policy.

As a qualified, permanent position on the ICU, the role of the CCS represents a highly skilled member of the multidisciplinary intensive care team.

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2.14 Support Staff

Authors: Ana Coelho & Marghanita Jenkins

INTRODUCTION

Support staff are a vital part of the multidisciplinary intensive care team. In addition to registered medical, nursing and allied health professionals, ICUs are reliant upon a range of support staff whose roles are vital to the provision of high-quality care and form an essential part of the multidisciplinary team.

Within this section, these key roles will be identified, and standards established, acknowledging that due to the wide variation in roles and qualifications the evidence is not strong for this group of staff.

`Support staff' include healthcare support workers (healthcare assistants), housekeepers/domestics/cleaners, ward clerks (receptionists), data clerks/analysts, secretarial and administrative staff.

MINIMUM STANDARDS

1. All support staff must have clearly identifiable roles with specific competencies.
2. All support staff must have a period of induction and supernumerary status.
3. All support staff must be appropriately trained, competent, and familiar with the use of equipment[1].
4. All support staff must be included within the intensive care team and be updated on key unit issues and developments[2].
5. Support staff roles must be clearly identifiable to colleagues, patients, and visitors to the department, either by uniform and/or name badges.
6. Intensive care areas must develop healthcare support worker roles to assist registered nurses in delivering direct patient care and in maintaining patient safety[3].
7. Healthcare support workers must complete the Care Certificate, the CC3N HCSW competencies and adhere to the Code of Conduct for healthcare support workers[4,5].
8. Administrative roles must be developed to ensure all clinical staff are free to give direct patient care and supported with essential data collection[3].
9. Each intensive care area must have sufficient staff responsible for the cleanliness of the environment.

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

1. All staff should be encouraged to attend further training and/or education to support their development.
2. Each intensive care area should have healthcare support workers 24/7 to assist nursing staff in delivery of direct patient care.
3. Each intensive care area should have ward clerk/receptionist cover seven days per week.
4. Each intensive care area should have a dedicated housekeeper/cleaner seven days per week.
5. Training provided to the dedicated team should meet recognised best practice standards and be adaptable to the complex and varied demands of the ICU environment.
6. The core housekeeper/cleaner team should be comprised of a minimum of two members for every 12 ICU beds over a 12-hour period.
7. Each intensive care area should have a data clerk or dedicated time allotted to a suitable member of staff for data entry to a nationally recognised audit casemix programme and responsibility for the validation of these data.[6]
8. Each intensive care area should have access to a designated suitable TRiM (Trauma Risk Management) practitioner to support when required.
9. Each intensive care area should have a designated medical equipment technician allocated to support overseeing and maintenance/contracts and sourcing/procurement of specialist devices and safety of equipment.

BACKGROUND AND EXPLANATION

The importance of support staff in the provision of good intensive care is fundamental to deliver good all-round patient care. Support staff enable those with the expertise in intensive care to efficiently offer the care they have been trained to implement, while developing roles in a complex environment that supports patient safety at all levels. Support staff offer a great number of essential contributions which include assistance with personal hygiene and the moving and handling of patients, stocking up of bedside consumables/equipment and cleaning of bed areas, all of

which provide an excellent resource for registered staff and support for patients. In addition, all support staff play an important role in communicating with patients and relatives, ensuring comfort measures and relieving anxiety.

ICUs may achieve the standards within these guidelines with development of a variety of roles, depending on unit size. ICNARC advise within their CMP Recruitment Pack 1 WTE member of staff is typically required for every 10 beds audited, to collect, input, submit and validate the data within the prescribed timescales for active participation.

Training of such staff is important, with competency assessments and individual performance review embedded in the unit philosophy[1–5]. To sustain this workforce, units might consider appropriate progression pathways. Encouraging staff to attend further training and/or education would support their development, including the pathways to develop through the NHS bands for example Health Care Support Worker>Nursing Associate>Senior Nursing Associate>Registered Nurse.

Training programs for band 4 roles are developing within intensive care nursing with the current guidance on the *CC3N Best Practice Guidelines for Registered Nursing Associates in Critical Care* published by the Critical Care Nurse Networks National Nurse Leads. Despite being a role in its infancy, they are increasingly involved with delivery of care under indirect supervision of registered nursing staff (see Chapter 2.6 on Registered Nursing Associate Staffing for more information).

Medical equipment technicians aid in education, training/training logs for all the equipment used in the intensive care setting. This role could also be involved in the stock levels and consumables coming through the supply chain, highlighting any blocks to supply that may impact patient safety/human factors at local and if needed organisation development network.

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2.15 Induction, Return to Work and Exit

Authors: Sarah Marsh & Julie Platten

INTRODUCTION

ICUs are staffed by a diverse multidisciplinary team from different healthcare backgrounds. This chapter refers to all staff working within intensive care and discusses induction, return to work and exit from intensive care.

Induction is an important process to ensure that all staff feel welcome within the unit and are supported to carry out their role effectively. It provides intensive care staff with the skills, knowledge, and competencies they need, as well as an understanding of the organisational and geographical setting.[1] Intensive care staff, like any other healthcare group, may require time away from work. The return-to-work process forms an integral part of re-integration and ensures staff are supported during this time.

Exit refers to when staff permanently leave intensive care and can include reasons such as starting a new post, finishing a rotation or at the end of a fixed-term contract. Retirement is its own special life-event and is not covered here.

The processes of induction, return to work and exit are vital to ensuring a quality service as well as improving retention and reducing attrition.

MINIMUM STANDARDS

Induction

1. All new members of staff must have an appropriate-to-role induction led by relevant members of staff[2–4].
2. Special consideration and adaptation of the induction programme must be given to those members of staff new to intensive care.
3. Special consideration and adaptation of the induction programme must be given to those members of staff from overseas for whom the NHS is a new environment, including a supernumerary period where needed.
4. All intensive care nursing staff new to intensive care, including nurses from overseas, must be allocated a minimum period of 12 weeks to enable achievement of basic specialist competencies[5].
5. Where direct care is augmented using assistive and supportive staff (including registered and unregistered nursing roles), appropriate induction must be provided by suitably trained intensive care nursing staff using national competencies[6].

Return to Work

6. There must be a policy in place to support staff returning to work after a period of absence.
7. Staff returning after a prolonged period of absence must have a personalised plan for their supported return[7,8].
8. A preceptorship period must be considered for those returning to intensive care after a period of time away from intensive care[9].

Exit

9. All staff when leaving intensive care must have the opportunity to feedback on their experience of working in the ICU including opportunities for learning and development[10].

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

Induction

1. Feedback from participants in the induction process should be gathered to inform future inductions.

Return to Work

2. Feedback regarding the process from those returning to work should be gathered to inform future processes.

Exit

3. A summary of trends gathered from the exit information should be reported to the ICU and hospital senior leadership.

BACKGROUND AND EXPLANATION

Induction is an important process for staff members new to any ICU. It is an opportunity for the unit to welcome staff, help them to integrate into the unit and ensure that they have the knowledge and skills to deliver a quality, safe service. The induction may take place over several days and use a variety of methods to deliver the programmes including pre-induction material to review, web-based learning packages and simulation. It is best practice for the new staff member and those providing the induction to keep a record of the induction, and the contents of the induction continuously reviewed to ensure accuracy and relevance. It is important that relevant and appropriate members of staff lead the induction.

High quality induction would cover topics such as:[2,3]

- Orientation to the physical layout of the ICU.
- Introduction to key members of medical, nursing, allied professional and operational support staff.
- Arrangements for access to all IT systems, including passwords, provision of identification badges and tutorials on the use of any clinical IT systems on the day of induction.
- Explanation and distribution of rostered work pattern, and their roles and responsibilities when rostered to work both during the daytime and out of hours.
- Highlighting key departmental guidelines and how to access them.
- Information on health and safety including fire safety, manual handling and infection control.
- Assigning mentors for new staff within intensive care[2].
- Assigning an educational supervisor (and/or a clinical supervisor) for resident doctors, ACCPs and where appropriate specialty doctors.[11-13]
- Guidance on how to raise patient safety concerns.
- Guidance on how to raise issues of bullying and undermining.
- Signposting key learning and training opportunities available in the ICU, department and wider local hospital.

Returning to work after a period of absence can be a stressful time. The reasons for taking time away from work can vary from personal to professional matters including ill health, caring responsibilities and professional development such as research. The length of absence may influence the speed of return to practice. If able, the absence from work might be planned prior to leaving alongside the plan for return, with attention given to changes in working hours, occupational health requirements and additional training needs. Upon returning to work, a supernumerary period would ideally be completed with regular check points to ensure progress is being made towards a safe return and a date to commence full duties agreed by both the returning member of staff and their supervisors.

Facilitating good induction and return to work processes can help to improve retention of staff but inevitably there will be an attrition rate. 'Exit interviews' aim to limit the loss of knowledge by capturing what staff know and have learned from their time spent in the organisation before they leave. It is also an opportunity to identify significant problems or barriers they have previously experienced in carrying out their work and can lead to a better understanding of challenges faced by the workforce.[10]

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2.16 Professional Development, Education and Training

Authors: Sarah Marsh & Julie Platten

INTRODUCTION

Professional development is essential for all members of the multidisciplinary team working in intensive care. Education and training are both intrinsically linked to the delivery of safe and high-quality patient care, and therefore high priority areas. This chapter aims to facilitate a relevant development, education, and training environment for the different groups of staff working in intensive care.

The requirements for the provision of a suitable education environment for clinical staff working in intensive care are defined in a number of publications from key organisations including the Service Specification for Adult Critical Care[1], the General Medical Council[2], the Critical Care National Network Nurse Leads (CC3N)[3,4,5] and the FICM[6].

For ease of reading, the minimum standards and recommendations for this chapter are arranged by staff groups.

MULTIDISCIPLINARY TEAM

It is acknowledged that not all members of the ICU multidisciplinary team are covered in this chapter of GPICS V3. It is intended that this section of the chapter provides enough generic guidance to benefit all ICU team members. AHPs, members of the pharmacy team and practitioner psychologists should read the below minimum standards and quality recommendations in conjunction with their respective GPICS V3 chapters.

MINIMUM STANDARDS

1. Members of the multidisciplinary team must have support to meet professional and regulatory CPD requirements.[7,8]
2. AHPs must utilise the *ICS AHP Capability Framework*, to track and guide professional development, working within the four pillars of practice.[9]

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

1. All members of the multidisciplinary team should be considered, where appropriate, eligible for intensive care educator roles.
2. Intensive care educators should be allocated sufficient time in their job plan to fulfil their role.
3. All members of the multidisciplinary team should be offered the educational opportunities they require to develop capabilities across a range of learning experiences to meet the defined learning outcomes for their continuing professional development.[1,4,10]
4. Study leave should be provided for all members of the multidisciplinary team for intensive care-related courses and conferences.
5. All members of the multidisciplinary team should be supported to attend ICU morbidity and mortality, governance and quality improvement meetings.
6. The medically led teaching programme, where appropriate, should be open to members of the multidisciplinary team.[1,4,6]

NURSING

MINIMUM STANDARDS

1. The ratio of clinical educator must equate to a minimum of 1 WTE per 75 registered nurses and non-registered healthcare support workers (headcount).[1,3,4]
2. Clinical educators must be in possession of post-registration Adult Critical Care Award[3,5], CC3N Step 4 Competencies for Adult Critical Care Nurses[5] and an appropriate post-graduate certificate in education or equivalent[4,5].
3. A minimum of 50% of registered intensive care nurses must be in possession of a post-registration critical care award.[3]
4. All clinical shift leaders must be working towards completion of CC3N Step 4 Competencies for Adult Critical Care Nurses and hold a post-registration critical care award.[3]
5. All registered nurses working in intensive care must be working towards completing the CC3N Steps Framework for Adult Nurses in Critical Care (Step 1, 2 and 3).[3,4,5]

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

1. The ratio of clinical educator should equate to a minimum of 1 WTE per 50 registered nurses and non-registered healthcare support workers (headcount).[3]
2. Clinical educators should have a job plan that ensures they have allocated time for all aspects of the role including preparation of educational resources.
3. Clinical educators' role and time should be always protected unless in exceptional circumstances.
4. Nurse education programmes should follow the *National Standards for Critical Care Education* and include both clinical competence and assessment.[4]
5. Specialist step competencies should be completed whenever relevant to the casemix of the unit.[5]

OUTREACH

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

1. Critical care outreach staff, whether they sit within or outside intensive care directorates, should possess critical care competency (enhanced, advanced, consultant), and achieve the competency level set out as part of their role description and in line with the Critical Care Outreach Practitioner (CCOP) Framework[11].

MEDICAL DOCTORS

MINIMUM STANDARDS

1. All non-consultant doctors must have a designated educational supervisor or SAS tutor. (see Chapter 2.2 Non-consultant Medical Doctors)
2. All doctors not in formal training must have an appraiser for revalidation. (see Chapter 2.2)
3. All doctors must have an agreed Personal Development Plan (PDP) relevant and realistic to their developmental needs.[12,13] (see Chapter 2.2)
4. Doctors in specialty training on the ICU must be provided with the opportunity to fulfil the relevant competencies and requirements of their specialty curriculum. (see Chapter 2.2)
5. All intensive care training units must have a FICM-appointed Faculty Tutor. (see Chapter 2.2)
6. Faculty Tutors must be given the same support and time to perform their role in terms of SPAs, as other College/ Faculty Tutors from other specialties.[6,14]
7. Educational supervisors must have job planning which allows 0.25 PA per ICU doctor in training.*
8. All senior doctors responsible for the educational supervision of doctors in training must be developed, supported and appraised annually using the criteria recognised by the GMC for this role.[1,15]

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

1. Educational/clinical supervisors, SAS tutors and appraisers should be allocated sufficient time in their job plan to fulfil their role. (see Chapter 2.2)*
2. All doctors should be given the time and opportunity to achieve the objectives within the personal development plan as agreed with their educational, SAS tutor or appraiser.[12,13]
3. Doctors should be able to access the resources (including time to learn) that will support the revalidation process.[16]
4. Educational Development Time (EDT) should be designated on the rota as protected time. (See Chapter 2.2)
5. There should be regular medical teaching for non-consultant ICU doctors and protected time to attend. (see Chapter 2.2)
6. ICU doctors should be supported to attend ICU morbidity and mortality, governance and quality improvement meetings. (see Chapter 2.2)
7. The development, education and training of all doctors on the ICU should be regularly reviewed through a local quality assurance process.
8. Faculty Tutors should consider the learning needs of all non-consultant medical doctors and ACCPs, ensuring that learning opportunities are allocated to the most appropriate members of the team during each shift, with priority given to intensivists in training (IiT) and those on the ICM portfolio pathway.

*There is no single nationally mandated PA allocation for those with roles in supervising non-consultant medical doctors. Final decision is as per locally agreed job planning. This recommendation seeks to promote quality in professional development, education and training.

ACCPS

MINIMUM STANDARDS

1. ICUs who employ or train ACCPs must have an ICM consultant lead for ACCPs. (see Chapter 2.3 ACCPs)
2. Continuing professional development (CPD/appraisal) for ACCPs must be carried out on an annual basis, in accordance with FICM CPD/appraisal guidance, which meets the revalidation requirements of their base professional regulator.
3. All ACCPs must have a PDP relevant and realistic to their developmental needs which has been agreed upon by their ICM consultant and ACCP clinical lead.[17]

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

1. There should be sufficient job planned ICM consultant time to allow 0.25 PA per ACCP in training and 0.125 PA per trained ACCP.[17,18]
2. ACCP clinical leads should be allocated sufficient time in their job plan to fulfil their role.
3. All ACCPs should be given the time and opportunity to achieve the objectives within their PDP.[17]
4. There should be a regular ACCP teaching and protected time to attend.
5. ACCPs should be supported to attend ICU morbidity and mortality, governance and quality improvement meetings. (see Chapter 2.3)
6. The development, education and training of ACCPs should be regularly reviewed through a local quality assurance process.

BACKGROUND AND EXPLANATION

ICUs are staffed by a multidisciplinary team drawn from medical, nursing and AHP backgrounds, and the educational activities and the learning environment have to reflect this, with participation in education by all members of the multidisciplinary team being encouraged.

Continuing professional development for staff working within intensive care is vital to deliver safe and quality care to patients. This includes the development of skills, knowledge, attitudes and behaviours to improve the performance of individuals and teams.

To provide quality education and training, trainers need the time and resources necessary to prepare and deliver educational opportunities, and this requires underpinning by an educational delivery infrastructure that supports all staff groups. As such, the development of the workforce should be included in the unit's workforce strategy and delivery plan.

Learning environments that encourage transparency in reporting patient safety issues and any deficiencies in educational provision, while also providing timely feedback on the issues raised and how they have been addressed, will ensure the provision of a quality intensive care service.

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2.17 Staff Wellbeing

Authors: Julie Highfield, Mike Carraretto, Catherine Plowright & Ema Swingwood

INTRODUCTION

Wellbeing relates to the ability to reach potential and to experience positive emotions. In the context of work, this translates to staff being able to do a good job and feel good about the job they do. Research has made the link between staff wellbeing and patient safety[1], quality of care and organisational performance[2]. Many guidelines[4-6] outline the responsibility of the employer to adopt a preventative and proactive approach in its wellbeing strategy. Focusing on primary prevention (i.e. working conditions both physical and psychological), in addition to secondary (e.g. wellbeing education) and tertiary interventions (e.g. occupational health, psychological intervention) ensures staff can reach their potential. Psychosocial risks at work are present in all aspects of healthcare, however in intensive care there is increased exposure to such risks. The UK Health and Safety Executive consider it an organisational responsibility to modify factors that impact on work-related stress[7].

MINIMUM STANDARDS

1. ICUs must have a staff health and wellbeing policy to support staff experience, engagement and retention (this could be the hospital policy with specific ICU additions).[3,5,6,8]
2. ICUs must provide adequate environmental conditions, including rest and break facilities9, conducive to physically safe and healthy working.[5,6] (see Chapter 1.3 Physical Facilities)
3. Each staff role must be designed to meet the work demands with the resources required to fulfil the job, including rotas being consistent with Health and Safety Executive requirements for adequate rest.[5-7]
4. Staff must be provided with formal and informal meeting spaces and systems to enable discussion and management of the emotional impact of work.[1,3,4,5,6,8,10]
5. ICUs must monitor health and wellbeing at an individual and team level.[3]
6. There must be clear and timely access to occupational health assessment and associated required professional physical and psychological interventions to support time from work, reasonable adjustments to work, and interventions to restore health and wellbeing as appropriate.[3,5,6]

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

1. There should be adequate staffing resources consistent with GPICS V3.
2. Staff should have access to job planning, personal development planning, annual appraisal and equity of access to educational opportunities.[3]
3. Leaders should be appropriately recruited, and have access to appropriate personal development, including the facility for mentoring and/or coaching services to support them in their role.[3,4,5,6,10]
4. ICUs should promote a supportive work environment to foster healthy working relationships, psychological safety and positive culture.[3,5]
5. ICUs should provide support for staff involved in adverse events.
6. There should be timely and meaningful consultations on changes and initiatives that regularly keep the staff informed.[5,10]
7. ICUs should provide frequent opportunities for shared learning, clinical communication, and reflection.
8. Staff of all grades and professions should be offered opportunities to contribute towards wider quality, safety and innovation projects.

BACKGROUND AND EXPLANATION

Poor staff wellbeing and burnout are associated with poor patient safety outcomes[11], with evidence indicating that increasing staff engagement could be an effective means of enhancing patient safety[12]. All intensive care staff are regularly exposed to work-related psychosocial stressors and staff wellbeing guidance needs to be considered applicable to the whole team. The acknowledgement of this, and our understanding of the means to mitigate this have come further since the first iteration of this chapter in GPICS V2. There are several UK bodies who have consensus guidelines about the health and wellbeing needs of NHS staff.

Ideally, ICUs will monitor and regularly review metrics of staff wellbeing as quality indicators (including measures of engagement rather than just measures of sickness), as well as utilising a stress risk assessment (such as the Health and Safety Executive's template)[3,5] and considering legal obligations such as the Health and Safety at work Act 1974,

and the Equality act, 2010.[13,14] Staff ought to have access to occupational health services, including physiotherapy and psychological therapy as required[3,5,6]. Some larger ICUs may choose to embed practitioner psychologists to lead on staff wellbeing, in addition to specifically trained staff such as professional nurse/AHP advocates and peer supporters, and some units may choose to have a clinician assigned a lead wellbeing role.

Work ought to be preventative, with job and system design in mind, drawing from disciplines such as human factors, as well as focussing on ways of engaging staff (e.g. newsletters and staff forums, involving staff in quality improvement) and encouraging two-way communication. ICU is not without adversity, so staff benefit from access to different ways to psychologically process what they have experienced at work. This includes routine clinical practice (e.g. multidisciplinary rounds, mortality and morbidity meetings, huddles, 'hot' debriefs and operational 'cold' debriefs), access to restorative clinical supervision (e.g. as provided by professional nurse/AHP advocates), reflective practice or reflective case discussion (e.g. as provided by Practitioner Psychologists), peer support, as well as specific reflective events (e.g. Schwartz Rounds, Post Event Team Reflections of Psychological Debriefs)[5]. Equity, diversity and inclusion needs to be embedded as part of the culture (see Chapter 2.18 Equity, Diversity and Inclusion).

Many of the standards and recommendations in this chapter have been designed to operate as part of a package of measures for staff wellbeing. They are not intended to be single interventions but instead will require a process of ongoing action and monitoring.

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2.18 Equity, Diversity and Inclusion

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Contributions from the ICS EDI Working Group members and WICM Sub-committee

INTRODUCTION

This chapter provides a practical guide for ICUs to cultivate an environment conducive to staff excellence, thus enhancing patient care. It offers evidence-based strategies for fostering equity, diversity, and inclusion (EDI) and serves as a roadmap to identify and achieve specialty-wide priorities and goals. By emphasising actionable steps, it reflects the commitment the Faculty of Intensive Care Medicine and the Intensive Care Society to advance EDI principles within intensive care.[1]

MINIMUM STANDARDS

Addressing unacceptable behaviour

1. ICUs must have a policy for recognising, reporting, and addressing unacceptable behaviours within the department, including bullying, harassment, and discrimination.[2]

Transparency

2. ICUs must ensure that the determinants of workplace equity, including role allocation, career progression, recruitment, rostering and leave allocation are subject to transparent processes, which have inclusivity and equity at their core.[2]

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

Leadership and Infrastructure

1. ICUs should appoint a lead for equity, diversity, and inclusion (EDI lead).[3]

Policy and Strategy

2. ICUs should develop a locally tailored EDI vision statement that reflects the context and needs of their intensive care services.[2]

Data Analysis and Representation

3. ICUs should report EDI related data through established local governance structures with a focus on role allocation, promotion, and access to leadership opportunities.[2]

Training and Development

4. All staff members should receive training on equity, diversity, and inclusion that is relevant, meaningful, and easily accessible.[1]
5. All staff members should have equitable access to educational resources, funding, and opportunities for professional development.[2]
6. ICUs should assign dedicated mentors for specific groups known to experience barriers to career progression, such as international graduates and locally employed doctors (LEDs), to ensure that they receive tailored support and development opportunities.[2,4]

Support for staff

7. ICUs should recognise and support the individual needs of staff.[5]
8. ICUs should have policies and provide support for staff members with caring responsibilities, such as parental leave and flexible working arrangements.[6]

Return to Work Policies

9. ICUs should have a compassionate and individualised return-to-work policy for staff members returning from extended leave due to reasons such as illness, maternity/paternity/parental leave, or caring responsibilities.[5]

Work-Life Balance and Career Longevity

10. ICUs should offer flexibility in rota and job planning to accommodate the diverse and evolving needs of staff.[5]

Reproductive health policy

11. ICUs should promote an open and supportive environment for discussing reproductive health, underpinned by clear policies and awareness of available support and resources.[1,7]

Understanding and mitigating diagnostic and systematic bias

12. ICUs should ensure that procurement processes prioritise medical devices that function to the same standard across the diverse population they serve.[8]
13. ICUs should provide training in culturally competent care, with emphasis on recognising how clinical conditions may present differently among patients of different ethnic backgrounds, to reduce disparities in healthcare outcomes.[8,9]
14. ICUs should support individualised care that actively minimises the risk of diagnostic overshadowing or bias towards patients with chronic health conditions, disabilities or other protected characteristics.
15. ICUs should establish regular forums for senior decision-makers to reflect on and discuss admission decisions.

BACKGROUND AND EXPLANATION

Intensive care thrives on the blended skills of a multidisciplinary team, where fostering equity, diversity, and inclusion is essential for optimal patient care. A diverse workforce alone does not ensure inclusivity; proactive strategies are required to address disparities and drive meaningful change.

This new chapter in GPICS V3 outlines recommendations to help intensive care services support today's multidisciplinary teams. These recommendations draw on evidence from diverse reports and best practice frameworks crafted by leaders in intensive care and the broader medical community. Towards an Inclusive Future, the largest EDI project in intensive care, uses the lived experiences of the multidisciplinary community to start to develop resources, education, and initiatives that prepare intensive care for the future.[1] The Workforce Wellbeing Best Practice Framework and Critical Staffing Series guide stakeholders in enhancing recruitment, retention, job satisfaction, and unit culture, positively influencing patient safety and clinical outcomes.[4] The NHS EDI improvement plan highlights EDI as essential for building a caring, efficient, and safe NHS, while outlining actions to improve workforce experiences, boost retention, and attract diverse talent.[1,3,4,5]

ICUs should appoint an EDI lead from any MDT role, ensuring they have protected time in their job plan to fulfil their clearly defined responsibilities, including undertaking appropriate training.[3] The EDI lead plays a central role in fostering an inclusive culture. This individual should collaborate with colleagues to develop a vision statement reflecting the department's commitment to EDI, ensuring it remains relevant over time.

Transparent workforce data analysis is crucial to tracking trends across all protected characteristics; age, disability, gender reassignment, marriage and civil partnership, pregnancy and maternity, race including colour, nationality, ethnic or national origin, religion or belief, sex, and sexual orientation. Partnering with HR, ICUs need to monitor promotion pathways, access to training, and retention rates to inform strategies for equitable career progression.[2,3,10–17] Recognising intersectionality is vital, as overlapping characteristics such as race, gender, disability, and socioeconomic background can compound barriers, influencing individuals' experiences of opportunity, inclusion, and progression.

EDI training will ideally cover unconscious bias, cultural competence, and inclusive communication, ideally integrated into clinical simulation for practical relevance. Staff have to be equipped to deliver culturally competent care, recognising disparities in healthcare access and conditions that present differently across ethnic groups. Culturally competent care includes awareness of staff needs such as flexibility around religious observance and dietary requirements. Factoring these considerations into rota planning, annual leave arrangements, and day-to-day team management provides a practical way to ensure staff feel supported while maintaining safe delivery of care.

Equitable access to professional development is essential. ICUs need to ensure all staff can benefit from education, funding, and mentorship, including tailored resources for those with disabilities or neurodiversity. Targeted support needs to be available for international graduates and underrepresented groups, fostering role models and career development.[2,5]

Flexible working arrangements are vital for staff with caring responsibilities, ensuring policies on parental leave and work-life balance are transparent and well-supported. These arrangements should also extend to those with elder-care responsibilities and to staff supporting dependants with disabilities or long-term health conditions.[18] ICUs need to provide structured return-to-work support, including mentorship, refresher training, and wellbeing resources, to ease reintegration after extended leave.[5]

Job planning and rotas should proactively accommodate individual needs, recognising the impact of disability, ageing, and reproductive health concerns including menopause, pregnancy, baby loss, and miscarriage. Clearly signposted support pathways and a culture of open discussion needs to be embedded to ensure that staff navigating these challenges, particularly those with disabilities, feel valued, supported, and able to thrive.[1,7]

By embedding EDI principles into all aspects of ICU operations, this chapter provides a practical guide to fostering inclusivity, enhancing team performance, and capitalising on the innovation and productivity improvements that diversity brings.

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Section 3

Clinical Care

3.1 Standardised Care of the Critically Ill Patient

Authors: Richard Innes & Peyton Davis

INTRODUCTION

The evidence base underpinning intensive care practice is improving and has enabled a degree of consensus on a number of elements of care, which are briefly presented in this chapter. In addition to trial data informing major areas of practice such as ventilation, there are multiple observational studies suggesting that adoption of a treatment 'bundle' approach leads to better outcomes, although randomised studies are currently lacking and are difficult to perform[1,2].

All intensive care units need to have policies, guidelines and/or checklists to achieve the following minimum standards and might consider their position in relation to the recommendations. However, while these are standards and recommendations that most patients will benefit from, there will be exceptional circumstances (e.g. severe asthma, unstable spinal injuries, and morbid obesity) in which these standards/recommendations are clinically not applicable or achievable.

The importance of sufficient numbers of appropriately trained staff for intensive care remains vital for delivering safe and effective patient care outcomes.

MINIMUM STANDARDS

1. Patients must be assessed daily for risk of thromboembolic disease and receive appropriate prophylaxis[3].
2. Patients undergoing controlled mechanical ventilation who have Acute Respiratory Distress Syndrome (ARDS) must receive a tidal volume of less than or equal to 6 ml/kg PBW.
3. Ventilated patients must have respiratory function evaluated daily and undergo spontaneous breathing trials where appropriate.
4. Sedation must be individualised to patient needs and the appropriateness of a sedation hold considered daily[4].
5. All patients must be assessed regularly for evidence of pain, with analgesia optimised to minimise sedation requirements.
6. All patients must be screened daily for evidence of delirium using a validated method and action taken to reduce risk/manage delirium as needed.
7. The need for continued indwelling catheters (e.g. intravascular or urinary) must be considered daily.
8. Indwelling catheters must be assessed daily for evidence of infection, ongoing need and suitability for removal.
9. Monitoring of invasively ventilated patients must include continuous waveform capnography.
10. Care bundles must be in place for Ventilator Associated Pneumonia (VAP) prevention, Central Venous Catheter (CVC) insertion and maintenance, and Peripheral Venous Cannula (PVC) insertion and maintenance.

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

1. Patients' height and weight should be recorded on admission to ICU or as early as possible if not feasible.
2. For patients without ARDS, a tidal volume of 4-8 mls/kg PBW and a peak/plateau pressure (depending on mode) of below 30 cmH20 should be targeted.
3. A ventilated patient care bundle should be in place with appropriate mechanisms for ensuring adherence.
4. Unless clinically contra-indicated, ventilated patients should be nursed in a semi-recumbent position at 30 to 45 degrees.
5. Where there is no contraindication, enteral nutrition (EN) should be initiated within 48 hours after admission to the ICU[5].
6. When EN is not feasible or insufficient, parenteral nutrition should be considered in patients with (or at high risk of) malnutrition, which may be a combination of cachexia (disease related) and malnutrition (inadequate consumption of nutrients).
7. Validated scoring systems, where available, should be applied to optimise analgesia and sedation according to defined targets.
8. Noise levels and patient interventions should be minimised overnight to facilitate natural sleep.
9. A transfusion threshold of 70g/L should be adopted in general for haemodynamically stable intensive care patients in the absence of indication for a higher haemoglobin target[6].
10. Viscoelastic tests, such as thrombo-elastography or ROTEM, should be available to guide the use of blood products.
11. Drug infusion concentrations should be standardised in line with Intensive Care Society's Standard Medication Concentrations for Continuous Infusions in Adult Critical Care.

BACKGROUND AND EXPLANATION

The bundled approach to clinical care is considered effective in improving clinical outcomes. The underlying premise is that by ensuring adherence across multiple logical elements of care, outcomes for patients can be improved. The most widely adopted bundle of care is the 'Ventilator' or 'Ventilator Associated Pneumonia' (VAP) bundle as advocated by the Institute for Healthcare Improvement (IHI)[7]. Many hospitals have reported dramatic reductions in VAP rates using this approach. However, VAP is a subjective outcome and lower VAP rates after implementing a bundle may partly reflect stricter application of subjective VAP criteria. Notably, most studies that have reported lower VAP rates after implementing a bundle have not reported parallel decreases in mortality, though it is likely they will reduce length of mechanical ventilation[1,2].

Some interventions beyond the IHI ventilator bundle might bring additional benefit to ventilated patients, such as low tidal volume ventilation, sedation minimisation, conservative fluid management, and early mobilisation. Thus, care bundles are an evolving entity, and new and better care bundles that integrate these promising new processes are needed.

It is important that care bundles are subjected to the same scientific rigour as traditional interventions, and to date this approach is lacking. Much data is observational in nature with varied study methodology, and this makes comparison difficult. Some interventions which are initially thought to be helpful (e.g. chlorhexidine mouth washes for ventilated patients) may subsequently be shown to be harmful or of no benefit[8]. Others, such as the use of drugs for gastric protection, have benefits (reduced bleeding) but also harm (higher rates of VAP and in some populations cancer), and so all components need to be implemented with some reference to the clinical context to ensure, where possible, benefit outweighs harm[1,2].

When implementing standards of care, the IHI recommends achieving reliability of > 95%. The three most frequently used strategies to achieve this are: education; reminders (such as checklists); and audit/feedback. The increasing use of electronic health records within intensive care may facilitate both development of new bundles and adherence to existing ones. Where available, ICUs need to use recognised and validated screening and scoring systems. For example:

- The Confusion Assessment Method for the ICU (CAM-ICU) or the Intensive Care Delirium Screening Checklist (ICDSC).
- The Visual Infusion Phlebitis Score[9] for indwelling intravascular catheters.
- The Riker Sedation–Agitation Scale or the Richmond Agitation–Sedation Scale for sedated and ventilated patients.

Intensive care is a combination of therapies, such as bundles, but their efficacy is reliant on the absolute essential factor of safe staffing numbers, training, education and protocols to deliver care in a recognised and standard format.

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3.2 Admission, Discharge and Handover

Authors: Fiona Christie & Matt Rowe

INTRODUCTION

Timely access to definitive care is an essential component of improving patient outcomes. The prompt escalation of care, including intensive care admission, necessitates direct involvement of the referring and receiving consultants. Standardised systems for the recognition and appropriate escalation of the deteriorating patient have to be in place, with consultant-to-consultant referral for all unplanned admissions wherever possible. The provision of clinical care within an intensive care setting involves a collaborative, multidisciplinary approach with standardised handovers for all clinical groups. All referrals need to trigger an immediate and frequently reviewed treatment plan with a documented treatment escalation plan. Efficient discharge processes can facilitate patient flow and will ideally occur as early as possible during the working day. This chapter should be read in conjunction with Chapter 2.1 Consultant Staffing.

MINIMUM STANDARDS

Admission

1. The time and decision to admit to the ICU must be clearly documented in the patient record.
2. The decision and management plan for any admission must be discussed with the duty consultant responsible for the ICU[1,2] and the nurse in charge, as soon as possible.
3. Unplanned admissions to the ICU must occur within four hours of making the decision to admit and the completion of the essential resuscitation and imaging.[2-4]
4. There must be clear documentation on the decision process for those who are referred and not accepted for intensive care admission and the in-patient treating team informed of the decision.[2,5]
5. Patients must be reviewed, in person, by a consultant responsible for the ICU as urgently as the clinical state dictates, and always within 14 hours of admission to intensive care.
6. Patients on intensive care must have a clear and documented treatment escalation plan.[2,6]

Discharge

7. Discharge from intensive care to a general ward must occur only between 0700hrs and 2159hrs, except for reasons of surge.[7-9]
8. Out of hours discharges must have an incident report completed.
9. The nurse in charge (or area leader in larger units) must be present in person for the ward round to ensure appropriate multidisciplinary discharge planning.

Handover

10. There must be a standardised handover procedure of patient care and responsibility at shift change for medical, nursing and AHP staff.
11. There must be a standardised handover procedure for medical, nursing, and all health professionals involved in a patient's care for patients discharged from ICU.[5,10]
12. Handover for patients discharged from ICU must include their structured rehabilitation programme.[5,11,12]
13. An intensive care consultant must undertake ward rounds twice a day, one of which will be face to face, seven days a week.[6,13] (see Chapter 2.1 Consultant Staffing)

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

Admission

1. Unplanned admissions should be seen by an intensive care doctor or ACCP within one hour of admission and first line management commenced, with clear documentation of discussion with the duty consultant in intensive care.
2. Patients considered 'high risk' (defined as where the risk of mortality is greater than 10%, or where a patient is unstable and not responding to treatment as expected), should have consultant involvement within one hour.[6]
3. ICUs should monitor and review the causes for unplanned readmissions, to focus improvement efforts on factors leading to readmission.

Discharge

4. Discharge from intensive care to a general ward should occur within four hours of the decision.[7-9]
5. Patients requiring repatriation to their local hospital to continue care should be transferred within 48 hours of acceptance by the receiving hospital. (See Chapter 3.14 Inter- and Intra-hospital Transfer)
6. All patients discharged from intensive care should be reviewed by intensive care or outreach team within the first 24-48 hours of leaving the unit.
7. Patients discharged from intensive care should have access to an intensive care follow-up service.[11,12, 14]

Intensive Care Outreach

8. ICUs should have a dedicated intensive care outreach team, separate to those with responsibility for the day-to-day running of the unit, able to respond promptly to concerns raised by the in-patient ward teams, support admission to ICU and review intensive care ward discharges. (see Chapter 1.17 Critical Care Outreach, Rapid Response Systems and Early Intervention).

BACKGROUND AND EXPLANATION

Data from the ICNARC Case Mix Programme Public Report 2022/23 recorded 201,505 admissions to a total of 267 intensive care units in England, Wales and Northern Ireland[15], SICSAG recorded 37,927 admissions to ICUs in Scotland in 2022.[16] The extent to which any individual hospital provides intensive care services should depend on the skills, expertise, access to specialties and facilities available. Whilst some patients will require transfer to another facility with advanced or sub-specialist clinical capabilities, capacity transfers should be avoided.

Recognition of the deteriorating patient, together with timely admission to intensive care and the initiation of definitive treatment has consistently been shown to be of prognostic importance.[2,3] Consultants in ICM play a crucial role in treatment planning, ensuring quality care, reducing mortality, and shortening hospital stays.

Discharge from the ICU should be a planned event, occurring as early as possible in the working day to facilitate high quality handover of care, improve communication with receiving in-patient teams and allow adequate opportunity for review. ICNARC data highlights an increasing number of delayed intensive care discharges exceeding 24 hours. Delayed discharges are shown to negatively impact on patients, with increased risk of delirium, sleep disturbance and delays in rehabilitation leading to an increased length of hospital stay.[7] Furthermore, delay in ICU discharge may also delay or reduce availability of ICU resources for patients requiring admission.

A standardised, high-quality handover must accompany every patient on ICU discharge. The receiving (ward) team responsible for ongoing care need to be directly involved in this process and there should be a verbal as well as written handover. Discharge handover needs to include, as a minimum:

- A summary of the intensive care stay, including diagnosis, treatment and changes to chronic therapies.
- A plan for monitoring and further investigation.
- A plan for ongoing treatment alongside a clearly documented treatment escalation plan (including Do Not Attempt Cardiopulmonary Resuscitation where appropriate).
- A clearly documented plan with regards to the patient's suitability for readmission to an intensive care environment, any limitations on treatment and any family discussions that have taken place on this issue.
- An assessment of the patients ongoing rehabilitation needs incorporating physical, emotional, psychological and communication needs.
- Intensive care follow-up arrangements.
- A named contact e.g. an appropriate intensive care consultant from whom further information can be sought as appropriate.

Complex patients at risk of prolonged recovery need to have a multidisciplinary, coordinated recovery programme documented. Goals need to be continually reviewed across the recovery continuum with early patient and carer involvement.

Unplanned readmission rates (within 48 hours) have been reported as approximately 1.1%.[15] Unplanned readmissions are associated with increased length of stay, increased consumption of resources and a higher morbidity and mortality.[17] A high early readmission rate may reflect premature discharge, incorrect use of ward care, inadequate handover or a poor response to treatment despite appropriate care. All ICUs should have processes in place to review recent discharges from the ICU environment and take steps to minimise unplanned readmissions to intensive care.

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3.3 Involving, Supporting and Respecting Patients

Authors: Alexander Bastin, Sian Saha, Laura Allum & Pam Ramsay
Contributions from ICUsteps Trustees

INTRODUCTION

Critical illness can be life changing. Admission to intensive care is often unexpected and it can be a very alien and frightening environment for patients. Patients might experience:

- Psychological distress and cognitive difficulties.
- Painful, distressing, and embarrassing procedures.
- Physical issues such as immobility, pain and dyspnoea.
- Delirium and/or paranoia.
- Confusion and disorientation.
- Frustration and boredom.
- Amnesia.
- Partial awareness while under sedation.
- Lack of sleep.
- An inability to communicate or retain information.

All healthcare professionals need to consider how their practice may affect the patient experience and recovery.

MINIMUM STANDARDS

1. There must be a documented formal assessment of each patient's communication needs and any adaptations required, which is updated through the ICU stay.
2. Patient preferences, values and beliefs which may impact on their care must be recorded and easily accessible to the healthcare team.
3. Patients must be regularly assessed for pain, thirst, dyspnoea and delirium, using validated tools if available, and the results recorded.[1-3]
4. All ICUs must have a guideline for managing patient pain, thirst, dyspnoea and delirium.[1-4]
5. All ICUs must have a guideline for, and practise, sleep promoting activities using non-pharmaceutical interventions.[3-5]
6. Delirium information and explanation must be available for patients and signposted when appropriate.[2]
7. Patients must be provided with or signposted to information and support after their ICU experience.[6]
8. All ICUs must have a designated safeguarding lead and policies on safeguarding vulnerable patients.

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

1. Staff should receive specific training about the patient experience in the ICU, particularly for those with a prolonged ICU stay, and how the experience can be humanised.[7]
2. The ICU team and patient's family and friends should be invited and supported to complete a patient diary and/or a timeline of ICU events to support patients' post ICU recovery.[5,8]
3. For patients who are expected to remain on the ICU for more than a few days, a 'this is me' board or equivalent should be considered.
4. The ICU should have a formal mechanism to receive patients' feedback after discharge.
5. Patient feedback should be shared with the ICU.

BACKGROUND AND EXPLANATION

The purpose of these standards and recommendations is to improve the patient experience within the ICU, where possible to reduce the incidence of Post Intensive Care Syndrome (PICS) and to promote patient rehabilitation.

Common issues that affect the patient experience include pain, thirst, dyspnoea, delirium and sleep. These can be assessed using validated tools such as the Critical Care Pain Observation Tool(CPOT), Confusion Assessment Method for the ICU (CAM-ICU). National (e.g., NICE guidelines: Delirium prevention, diagnosis and management) and local guidelines to manage these issues and to promote sleep should be rigorously followed. These may include

interventions such as the use of sleep masks and earplugs for sleep[2], making clocks available for patients to see, access to natural daylight and visits to outdoor spaces. Assessment of patient needs may include suggestions for promoting patient communication (e.g. use of interpreters, alphabet/picture charts or whiteboards) and preferences for cognitive stimulation where appropriate (e.g. music, news, access to outside spaces, phones).

While it is common for patients to have difficulty retaining information on the ICU, it is vital that all efforts are made to provide clear explanations to all patients about their care on the ICU, including the possibility that they may experience delirium. Verbal information (ongoing dialogue) may be most appropriate while the patient is in the ICU, but information in different formats and languages should be available both within the ICU and on discharge. Information about the ICU and delirium should be signposted to all patients, via local or national resources, such as ICUsteps (available online or printed), nhs.uk and criticalcarerecovery.com.

Patient diaries can be an effective tool to help patients process their ICU experience and aid in psychological recovery. The patient 'this is me' board supports humanisation while in the ICU, provides insight into the patient as a person and can assist healthcare providers in delivering tailored care. With the patient or family's consent, the board may include patient interests/ hobbies, cultural practices, religious beliefs, dietary requirements/preferences, family/friends and photographs. Paying particular attention to understand and respect patient preferences, values and beliefs can make the ICU experience less distressing for the patient. These may include, for example, close relationships they may have, culture, religion and gender identity.

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3.4 Involving and Caring for Patients' Family and Friends

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Contributions from ICUsteps Trustees

INTRODUCTION

'Family' is not a singular unit; it is composed of numerous individuals with varying importance to the patient. For that reason, we use 'family and friends' in this chapter.

Family and friends play important roles in a patient's ICU journey, and they often experience significant emotional, psychological, and practical challenges. Understanding and addressing these challenges is essential to fostering a supportive environment for both patients and their family and friends.

Ideally, patients will nominate at admission to hospital which family and friends they consider need to be kept updated by the ICU team. If this is not possible, because the patient lacks capacity, respectful assumptions by the ICU team will need to be made. Almost invariably patients are willing for their closest family and friends to be kept updated by the intensive care team. If this is not the case, patient autonomy and confidentially has to be respected.

MINIMUM STANDARDS

1. Patients' family and friends must be able to visit every day, either in person or virtually.
2. The ICU must have rest areas and private spaces for discussions with family and friends visiting the patient.
3. Information regarding the ICU environment, staff, routines, available services and what to expect in ICU must be available and readily accessible for patients' family and friends.
4. When not physically present on the ICU, patients' nominated family and friends must be able to receive appropriate updates regarding the current condition of the patient.
5. If patients lack capacity, have communication difficulties or are otherwise unable to advocate for their preferences, those who are close to the patient or have an interest in their welfare must be involved in any important clinical decisions, in accordance with relevant legislation.[1,2]
6. Communication with family and friends regarding the patient must be clearly documented.

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

1. ICUs should have a formal mechanism to receive feedback from patients' family and friends.
2. ICUs should identify staff to lead in supporting family care and developing this service.
3. ICUs should provide staff training on effective support and communication for patients' family and friends which incorporates any formal and informal feedback.
4. Family and friends should be signposted to accessible information regarding common ICU conditions.
5. Appropriate ways for family and friends to support a patient's wellbeing and psychological care should be defined locally and clearly signposted.
6. Technology to allow family and friends to communicate virtually with the patient or the ICU staff should be available.
7. The ICU team and patients' family and friends should be invited and supported to complete a patient diary and/or a timeline of ICU events to support patients' post ICU recovery.[3,4]
8. Information regarding additional support for patients' family and friends should be available.
9. Bereavement support should be provided to the family and friends of those who die on ICUs.
10. Nominated family and friends should be offered an opportunity to discuss the care of a patient who dies on the ICU with a member of the clinical team.

BACKGROUND AND EXPLANATION

Admission to an ICU can be an incredibly stressful experience for the patient's family and friends. Effective communication (using interpreters as needed) with family and friends is essential to help them better cope with the situation. Promoting family engagement is a key component to safe and effective patient care[5] and can help reduce the incidence of Post Intensive Care Syndrome-Family (PICS-F)[6]. Family and friends can also provide vital insights into the values and wishes of patients who lack capacity to support clinicians to make appropriate patient care decisions. Embedding EDI principles into clinical decision-making, consent, and family engagement ensures these discussions are inclusive, culturally sensitive, and equitable.

Information about the ICU needs to be available in various formats and languages and shared both verbally and in the most appropriate format ideally as soon as the patient is admitted. This information could include details such as visiting hours, contact phone numbers, an overview of ICU equipment, common medical terms, and an introduction to the ICU team[7].

Family and friends' engagement in ICU activities can include practical tasks, such as applying moisturising cream or doing mouthcare which may help reduce symptoms of PICS-F and support the patient to feel safe[8]. Family and friends can also inform the healthcare team about the patient's needs and preferences, such as any communication impairments, cultural practices, religious beliefs and dietary preferences. To support the healthcare team to humanise the ICU environment, family and friends may bring in patients' personal items such as toiletries, books, and personal phones when appropriate.

Providing information to family and friends, about common ICU conditions (e.g. delirium) is also important. This can be done through local resources, such as leaflets, or national websites such as ICUsteps or Critical Care Recovery. These online resources provide helpful information as well as psychological and practical support for family and friends which can be signposted during the patient's ICU admission and on ICU discharge. Support for family and friends may also be available through family liaison nurses, social workers, psychologists, follow-up clinics and peer support groups. Information resources and practical advice (e.g. financial advice, legal support) should be signposted (e.g. Citizen's Advice).

The physical wellbeing of family and friends needs to be considered. Hospitals would ideally provide access to drinking water, nutritious food, and hot drinks 24/7.

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3.5 Airway Management

Authors: Andy Higgs & Linda-Jayne Mottram

INTRODUCTION

Over 100,000 patients per year are admitted to intensive care in the UK and receive invasive mechanical ventilation. Almost all of these will undergo airway management, which involves tracheal intubation and/or formation of a tracheostomy.

About 6% of all intensive care patients have a known anatomically difficult airway or several anatomical risk factors[1,2,3]. More recently, the concept of the physiologically difficult airway has been recognised[2] and perhaps most UK Level 3 ICU patients have elements of the physiologically difficult airway. Evidence-based guidelines help to inform the advanced airway management required for these more difficult airways, including its institution and common complications[3].

This chapter should be viewed in conjunction with Chapter 3.6 Respiratory Support.

MINIMUM STANDARDS

1. ICUs must have clear processes for summoning advanced airway practitioner support, including personnel able to perform and assist an awake tracheal intubation and ENT support[3].
2. ICUs must have immediate access to the appropriate airway devices which include the equipment necessary to manage a difficult airway[3].
3. Each patient undergoing an advanced airway intervention must have a trained airway assistant[3].
4. Key airway management records must be regularly accessible to the clinical team.
5. ICUs must have regularly checked, audited and restocked airway trolley, comprising Difficult Airway Society (DAS) guideline Plan A-D drawers[4].
6. When managing an airway, ICUs must have access to appropriate monitoring in accordance with the DAS-ICS-FICM-RCoA guideline on intubation in the critically ill patient[3].
7. All patients ventilated via an artificial airway must be appropriately monitored in accordance with the DAS-ICS-FICM-RCoA guideline on intubation in the critically ill patient[3].
8. ICUs must have immediate access to chest radiography and point of care ultrasound (POCUS) to assess the airway and exclude complications of airway management.
9. ICUs must have a named medical doctor as lead for airway management.
10. ICUs must have written guidance for airway management in ICU.
11. Standardised bed head signage must be displayed for patients with laryngectomies, tracheostomies and known difficult airways[5,6].
12. ICUs must ensure that patients with complex, or 'at risk', airways are identified at handover and that a plan for emergency reintubation is made[1,3].

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

1. Safe airway management checklists should be available and used routinely[2,3].
2. ICUs should regularly undertake audits of airway practice and complications.
3. ICU procurement should be made in tandem with emergency and operating departments to ensure consistency of airway devices and approach.
4. ICUs should have a named individual as AHP or nursing airway lead.
5. ICUs should incorporate human factors and sim-based training with airway teaching[7].
6. ICUs should have written guidance for securing an artificial airway device, suctioning and humidification.
7. ICUs should ensure appropriate de-briefing after complications of airway management.

BACKGROUND AND EXPLANATION

Airway management is complicated in critically ill patients by their inherent physiological instability. The potential for harm during airway manipulation is greater than in other patient groups, and therefore optimal conditions, equipment, processes and team performance are imperative for safe airway management.

A UK network of airway leads was developed to drive improvements in airway safety. Every ICU requires a medical doctor to be named airway lead who can be solely responsible for intensive care but may also be the RCoA hospital airway lead. If not the same individual, regular liaison between the airway leads for intensive care, the emergency department and the anaesthetic department is needed.

Airway leads are able to develop written guidelines and improve training standards, with a renewed focus on core competencies for trained airway assistants. We suggest incorporating simulation and human factors elements in addition to airway technical skills training, as critical incidents continue to highlight this need[1,3,7,8]. Auditing airway practice and complications to identify excellence, training needs and areas of practice requiring improvement will be an important part of the airway lead role. In addition, a proactive and adaptive safety culture needs to be encouraged within units and across hospital departments, prioritising safe airway management as a key domain of intensive care practice.

The range of equipment for airway interventions must be commensurate with national and international standards and be readily available for use. There is increasing evidence for video laryngoscopy to improve airway management, training and safety[3,9]. Capnography is a key monitoring standard, and recent international guidance highlights its role in preventing unrecognised oesophageal intubation[10]. Equipment must be stored for optimal and immediate use in emergency situations, using the Difficult Airway Society Plan A-D approach[4]. Stocking and checking this equipment must become embedded within daily intensive care safety procedures, with a named individual responsible for stock control of airway devices.

ICUs require immediate access to airway devices as deemed appropriate by the airway lead and following risk assessment:

- Direct and video-laryngoscopes[3,9], including standard MacIntosh geometry VL devices and hyper angulated blades.
- Airway adjuncts (e.g. oropharyngeal and nasopharyngeal airways, bougies, Aintree Intubation Catheters or equivalent, stylets and any device-specific adjuncts.)
- Self-inflating and flow-driven manual ventilation bag devices, HFNO and CPAP-NIV devices.
- High pressure, low volume cuffed endotracheal tubes and 2nd generation supraglottic airways.
- Tracheostomy tubes including standard and adjustable-flanged, flexible reinforced tracheostomy tubes, and those incorporating sub-glottic suction ports.
- Flexible bronchoscopes and laryngoscopes[3].

Good record keeping and readily accessible documentation is an essential part of airway management. Key information includes:

- The laryngoscopic views obtained during any previous intubation attempts needs to be recorded, together with the name of the operator and which device was used
- Date of intubation or tracheostomy formation
- Tube size and insertion depth
- Tracheal cuff pressure (ideally maintained at 25cm H2O, or 5cm H2O above peak airway pressure).
- Date of any tube change
- ETCO2
- ABGs
- Ventilation parameters.[3]

Written guidance (such as guidelines, SOPs, checklists, etc.) for airway management in ICU include:

- Planned and emergency intubations both on and off ICU, incorporating preventing unrecognised oesophageal intubation, managing intubation in airborne infection (e.g. COVID- 19), and managing failed intubation including rescue techniques, such as intubation via supraglottic airway and emergency Front of Neck Access (eFONA)[3].
- Extubation in ICU[3].
- Safety checklists for intubation and percutaneous tracheostomy[3,5].
- Managing tracheostomy/laryngectomy emergencies[5,6].
- Maintenance of an artificial airway during patient re-positioning including patient turns and prone positioning.

These can be supplemented by the use of cognitive aids to optimise time sensitive management of airway complications[8].

Tracheostomy is an area of specific risk. Insertion checklists and standard procedures[5,6], alongside appropriate bedside signage is an important part of patient safety. Any complex airway, inclusive of tracheostomised patients, is a key point of information that requires communication to receiving teams in handover.

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3.6 Respiratory Support

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INTRODUCTION

Over 100,000 patients per year with acute respiratory failure are admitted to intensive care in the UK for mechanical ventilation and respiratory support. There are peaks and troughs of demand, with the winter months normally being the busiest time. Patients spend on average eight days requiring invasive mechanical ventilation. Non-invasive respiratory support may avoid the need for invasive mechanical ventilation in some patients with acute respiratory failure. Liberating a patient from ventilation (weaning) is a key priority. Standardised management improves outcomes for patients with acute respiratory failure[1], therefore evidence-based guidelines can inform optimal management and approaches to weaning[2-8].

This chapter should be viewed in conjunction with Chapter 3.5 Airway Management.

MINIMUM STANDARDS

1. ICUs must have access to sufficient modern invasive and non-invasive ventilators, continuous positive airway pressure and high flow nasal oxygen devices.
2. Pulse oximetry, waveform capnography, ECG, blood pressure monitoring, ventilator alarms (where relevant) and point-of-care arterial blood gas analysis must be used for all patients receiving invasive respiratory support.
3. ICUs must have evidence-based guidelines for the management of acute respiratory failure, including Acute Respiratory Distress Syndrome (ARDS)[2-5].
4. ICUs must have an evidence-based guideline for the prevention of ventilator associated pneumonia[6].
5. ICUs must have an evidence-based guideline for ventilation weaning, which includes sedation use.
6. ICUs must have an evidence-based guideline for referral for Extra-Corporeal Membrane Oxygenation[7-8].
7. Equipment and standard operating procedures, including checklists, must be in place for any high-risk procedure[9-11].
8. Units must have protocols in place to manage oxygen flow at times of peak demand, and to ensure safe use of oxygen cylinders where there is no access to pipeline supply[12,13].

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

1. Tidal volume (ml/kg predicated body weight), plateau airway pressures and cumulative fluid balance should be monitored and recorded daily in all patients with acute respiratory failure[2-4].
2. ICUs should audit adherence to guidelines, standard operating procedures and checklists relating to the management of acute respiratory failure[2-8].
3. ICUs should monitor ventilator associated pneumonia rates[7].
4. Non-invasive respiratory support should be considered for all patients with respiratory failure that are not responding to standard oxygen therapy[5,14,15], although used with caution in more severe ARDS[16].

BACKGROUND AND EXPLANATION

This chapter focuses on supportive care interventions for acute respiratory failure rather than pharmacological treatments.

To deliver safe and effective care, ICUs need to have sufficient equipment, trained staff, evidence-based guidelines, standard operating procedures and checklists to deliver safe patient care[9-11]. Systems must be in place to ensure the safe continuation of oxygen supply during times of peak demand, and to ensure the safe use of oxygen cylinders[12,13].

High-risk procedures require appropriate equipment and standard operating procedures, including checklists. There is national guidance which can be adapted for many high-risk procedures including for intubation, extubation, bronchoscopy, prone positioning and tracheostomy[9-11].

Non-invasive respiratory support should be considered for all patients with respiratory failure that has not responded to standard oxygen therapy. Pressure targeted, non-invasive ventilation is an effective treatment for acute hypercapnic respiratory failure[5]. Pressure targeted, non-invasive ventilation, continuous positive airway pressure ventilation and/or high flow nasal oxygen can also be effective in reducing the need for intubation in patients with acute hypoxaemic respiratory failure[14,15]. In patients with COVID-19 related acute hypoxaemic respiratory failure current

evidence favours the use of continuous positive airway pressure as the first line choice for non-invasive respiratory support[14]. Evidence also supports the use of non-invasive respiratory support following extubation in those at high risk of respiratory failure or as an adjunct to aid weaning in those who fail a spontaneous breathing trial[17].

The routine use of high frequency oscillation ventilation, recruitment manoeuvres, extracorporeal carbon dioxide removal (ECCO2R) are not clinically recommended[18]. There is insufficient evidence at present to inform clinicians about the role of awake prone positioning, endotracheal tubes with subglottic suction, airway pressure release ventilation, and automated weaning technologies in acute respiratory failure. Ideally patients receiving these therapies would do so as part of a clinical trial where available.

ICUs must have evidence based guidelines for the management of ARDS, ideally these would be based on international consensus guidelines[2-5]. Patients with and at risk of ARDS benefit from ventilation strategies which limit exposure to airway pressures >30 cm H2O and tidal volumes >6ml kg[3,4]. Guidelines recommend the use of protective ventilation and prone positioning for at least 12 hours in adults with moderate and severe ARDS. Conservative fluid management, higher PEEP strategies, and ECMO are also supported, while high frequency oscillation, high pressure recruitment manoeuvres, ECCO2R are not recommended[3,4]. Many of the principles described remain relevant for COVID-19[2].

Evidence supports the use of sedation and weaning protocols which include the use of spontaneous breathing trials with inspiratory pressure augmentation, minimisation of sedation, use of non-invasive ventilation in patients at high risk of extubation failure, early mobilisation, weaning protocols and cuff leak test in patients at high risk of post-extubation failure[6,8].

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3.7 Cardiovascular Support

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INTRODUCTION

More than 149,000 patients are admitted to hospital with acute heart failure or myocardial infarction in England, Wales and Northern Ireland each year[1,2]. Cardiovascular disease (CVD) accounts for a quarter of all deaths in the UK each year[3]. An estimated 6.1 million people in England live with CVD; clinicians need to have a high index of suspicion for cardiac dysfunction in intensive care.[3]

Cardiovascular instability is the most common reason for admission to UK ICUs, with basic cardiovascular support the most common organ support delivered.[4] The need for cardiovascular support may reflect new cardiac pathology or concurrent critical illness that decompensates the cardiovascular system.

Echocardiography is essential for the diagnosis of cardiac conditions with networks of care fundamental to the management. Most patients requiring cardiovascular support will be successfully managed in ICUs throughout the UK by the delivery of Level 2 and 3 care. However, some patients will require specialist cardiac input or transfer.

MINIMUM STANDARDS

1. ICUs must be able to manage patients requiring advanced cardiovascular support (Level 2 and 3 care) which would include the use of invasive arterial blood pressure and central venous pressure monitoring and inopressors.
2. Patients admitted to ICUs with potentially reversible cardiogenic shock or who are candidates for transplantation must be discussed early with cardiogenic shock centres capable of providing mechanical cardiovascular support (MCS) or regional advanced heart failure centres[1,5]

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

1. Immediate coronary angiography and PCI of the infarct-related artery (if indicated) should be considered in critically unwell patients with complications of Acute Coronary Syndrome (ACS).[6]
2. In cases of mechanical complications of ACS or acute valvular pathology resulting in cardiogenic shock, Heart Team discussion should occur to consider emergency surgical or catheter-based repair.[6]
3. All ICUs should have the capability to either non-invasively or invasively assess cardiac output.
4. All patients with suspected acute heart failure or cardiogenic shock should have a focused echocardiogram within 24 hours and access to formal echocardiography.
5. Patients admitted to ICUs with acute heart failure should have access to the local heart failure multidisciplinary team.[7-9]
6. Cardiogenic shock (CS) centres should have 24/7 access to the range of cardiology specialties, mechanical circulatory support (MCS) and the ability to perform invasive hemodynamic monitoring and imaging.
7. CS networks should be established to include CS centres and regional advanced heart failure centres.[5]
8. Guidelines and pathways should exist within networks for the referral and transfer of patients to CS centres or regional advanced heart failure centres, and for repatriation of patients back to their local intensive care service.[3,5]
9. ICUs should adopt the Society for Cardiovascular Angiography and Interventions (SCAI) staging as the standardised descriptor of cardiogenic shock to facilitate triage, communication and expediency of discussion with CS centres and regional advanced heart failure centres.[5]
10. A consultant intensivist should have the opportunity to input into multidisciplinary cardiology discussions when planning both elective and emergency procedural treatment for intensive care patients and those at high risk of requiring intensive care support post procedure, including those patients being transferred in on other established cardiac referral pathways.[3]
11. CS networks should work with regional transfer services to ensure they develop the requisite skills to transfer the sickest cardiology patients.[10]

BACKGROUND AND EXPLANATION

For patients who present with a diagnosis of cardiac dysfunction or in whom pre-existing cardiac disease has decompensated due to critical illness, imaging, multidisciplinary working, and networks of care are essential to high quality care.

Networks of care use a collaborative model to deliver safe and effective elective and emergency services which ensures equity of access to high quality care. The structure for a recommended cardiology network has been previously defined in the Cardiology GIRFT Programme National Specialty Report[3]. This report outlines a cardiology network comprising four levels of care, with all hospitals participating in the network ensuring patient access to all four levels. In brief these are made up of:

- Level 1 -base level services for acute cardiology patients
- Level 2 - Level 1 plus access to pacing and PCI services
- Level 3 - Level 2 plus 24/7 access to PCI, interventional electrophysiology and 7/7 access to TOE
- Level 4 -Level 3 plus structural interventions, VT ablation and cardiac surgery.[3]

These levels of care provide the bases for established networks for myocardial infarction, cardiac conduction and valvular pathologies. However, these levels of care do not include the provision of MCS or transplantation. CS networks are less well established; however, CS networks have the potential to leverage existing cardiology networks to develop a 'hub and spoke' model of care[5]. This is likely to take the following format:

- Level 1 and Level 2 centres focusing on recognition of CS (through NEWS2 and early access to echocardiography) and stabilisation.
- Level 3 and Level 4 centres acting as CS centres providing interventional cardiology services and short-term MCS. Within CS centres, expert decision making will be led by a multidisciplinary (shock) team comprised of an interventional cardiologist, a cardiac intensivist, cardiac intensive care nursing staff, a heart failure cardiologist and a cardiac surgeon with or without a member of the regional transplant team or specialist palliative care.
- Regional advanced heart failure (Level 4) centres providing access to long-term MCS and heart transplant. These may additionally function as CS centres.

Whilst current guidelines recommend that hospitals who admit acute cardiology patients have access to echocardiography 24/7, this may not be universally available. Intensive care physicians have an important role in improving access to echocardiography out-of-hours to support / exclude the diagnosis of cardiac pathologies[5]. This will facilitate appropriate triage. The sickest patients need to undergo emergent echocardiography by someone trained to British Society of Echocardiography (BSE) level 1 standard or higher[3,5,6].

Pulmonary artery flotation catheters remain the gold standard cardiac output monitor. However, their use is infrequent outside cardiac centres. All centres need to have the capability to either non-invasively or invasively assess cardiac output including the use of echocardiography; centres might consider limiting the variety of cardiac output monitors used and/or concentrate the skillset in a smaller number of clinicians.

Patients with acute cardiology pathology who are deteriorating despite supportive care should be discussed with the Heart Team. The composition of this multidisciplinary team will vary between sites. However, networks of care ensure that all patients have equitable access to imaging, interventional cardiology, and cardiac surgical services as well as leveraging existing care pathways such as those that deliver primary PCI. Intensive care transfer services are likely to play an integral role in the functioning of cardiology networks but may require upskilling[3,10].

For the sickest of patients, MCS or cardiac transplant may be appropriate[1] and early discussion with CS centres is recommended[5]. Where patients (who are candidates for escalation) remain in their base hospital, regular communication with the CS centre is advised to ensure timeliness of escalation/transfer or de-escalation[11].

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3.8 Renal Support

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INTRODUCTION

There is no currently available treatment for severe acute kidney injury (AKI) and renal replacement therapy (RRT) remains the mainstay for supportive therapy. The main types of acute RRT available for critically ill adults in the UK are haemodialysis and haemofiltration provided either continuously or intermittently. Acute peritoneal dialysis is rarely used.

MINIMUM STANDARDS

1. ICUs must have the necessary facilities and expertise to provide acute RRT for patients with AKI on a 24/7 basis.
2. Patients receiving acute RRT must be cared for by a multidisciplinary team, trained and experienced in delivering and monitoring RRT.
3. Patients receiving acute RRT, where the cause of AKI is unclear or where RRT will be needed on intensive care discharge, must be discussed with the local renal team.
4. The dose of RRT must be prescribed at the beginning of the RRT session, reviewed daily and tailored to the needs of the patient.[1]
5. There must be close collaboration with an intensive care pharmacist with experience in AKI and the effects of RRT.
6. When discharged from intensive care, the accepting team and GP must be informed that the patient had received RRT for AKI whilst in intensive care so that appropriate follow-up can be arranged.

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

1. The decision to initiate RRT should be based on the condition and prognosis of the patient as a whole, and not on isolated urea or creatinine values[1,2].
2. Where life-threatening complications of AKI occur and are not responding to medical management, RRT should be started emergently unless a decision has been made not to escalate therapy[1,2].
3. There should be close liaison with the regional renal service regarding transfer and vascular access for patients with end-stage renal failure, who are not in a renal unit or dialysis centre and require urgent RRT in ICU.
4. Patients with end-stage renal failure who are not in a renal unit or dialysis centre and require urgent RRT should be considered for intensive care admission.
5. The choice of therapy should be based on patient status, expertise of the clinical staff, and the available technique(s).
6. The decision to use anticoagulation to maintain circuit patency and the choice of anticoagulant should be based on the potential risks and benefits in an individual patient, the expertise of the clinical team, and the options available.

BACKGROUND AND EXPLANATION

Critically ill patients with severe AKI commonly receive RRT[3]. The optimal timing remains uncertain but in patients without limitations in care, there is consensus that RRT is indicated in case of urgent or refractory complications of AKI. Recent randomised controlled trials (RCTs) confirm that pre-emptive or earlier RRT does not confer clinical benefit, implying that a "watch and wait" strategy is acceptable[3-6], rather than relying on isolated urea or creatinine values[1,2].

The choice of technique depends on availability, clinical expertise and patient characteristics. Although continuous RRT (CRRT) offers the theoretical advantage of improved haemodynamic tolerance, evidence to support this is conflicting. Secondary analyses of the AKIKI and IDEAL trials suggested that, compared to conventional intermittent haemodialysis (IHD), CRRT as first modality conveyed no benefit in terms of survival or kidney recovery and might even have been associated with harm in some patients[7]. In contrast, data from the RENAL, ATN and STARRT AKI trials demonstrated better outcomes if CRRT was used as first modality[8,9]. At this stage continuous and intermittent RRT needs to be considered as complementary therapies for AKI[1].

The dose of acute RRT needs to be tailored to the patient's metabolic and fluid status. RCTs have failed to demonstrate improved survival or renal recovery with higher delivered doses[10,11]. The KDIGO guideline recommends delivery of an effluent volume of 20–25ml/kg/h for CRRT[1]. To compensate for interruptions in treatment, a higher dose may have to be prescribed (i.e. 25-30mL/kg/h). When using intermittent RRT, a Kt/V of 3.9 per week ought to be delivered.

The KDIGO guideline suggests regional citrate anticoagulation for CRRT, and unfractionated or low-molecular weight heparin for patients receiving intermittent RRT[1]. However, citrate anticoagulation requires training and expertise and is not available in all ICUs in the UK[12].

Drug clearance is affected by the mode and dose of RRT. Therefore, drug doses need to be reviewed and adjusted each time RRT is started or the prescription of RRT is altered. Input from intensive care pharmacists is advised. Standard enteral nutrition is recommended, provided there are no refractory electrolyte abnormalities or fluid overload[13,14].

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3.9 Gastrointestinal Support and Nutrition

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INTRODUCTION

Malnutrition is typically understood as encompassing undernutrition from inadequate intake/absorption of food, nutrient classes (e.g. protein/energy) or elements (e.g. vitamins). It is also a disorder of overnutrition, usually from excess energy intake causing obesity. ICU admission may result causally (directly or via co-morbidities), or through impacts of malnourishment-causing diseases.

MINIMUM STANDARDS

1. Nutritional status and risk must be assessed and documented on ICU admission[1,2].
2. Malnutrition risks increasing mortality, morbidity and length of stay, and must be sought and assessed in all patients staying in ICU >48 hours[3].
3. The type and position of nasogastric tubes (NGTs) used for enteral nutrition (EN), hydration and/or drug administration, must comply with NHS England guidelines (or equivalent) and be no larger than 14 French gauge[4,5].
4. A range of EN products must be available to meet the service needs.
5. There must be access to a range of parenteral nutrition (PN) bags which include vitamins, trace elements and minerals, to meet the service needs.
6. A nutrition support guideline must be available to promote nutrition delivery, and to advise on managing EN intolerance and when to commence PN.
7. Guidance must be in place to identify and allow safe initiation of nutrition in those at risk of refeeding syndrome.

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

1. Nutritional intake targets should be compared daily with actual intake received.
2. After initial protocolised feeding, individualised nutritional intake plans should be initiated to address nutritional deficits, avoid refeeding syndrome, and correct micronutrient deficiencies.
3. An individualised obesity management plan should be made to avoid overfeeding and address any comorbidities[6].
4. An intensive care dietitian or appropriately trained clinician should assess energy, protein, and micronutrient targets weekly, with adjustments for patients with a BMI > 30 kg/m².
5. The non-nutrient energy from medications and fluids should be accounted for to avoid overfeeding.
6. Nasal bridles should be provided for securing NGTs in agitated patients, with adherence to local guidelines for their use and aftercare being ensured.
7. There should be access to postpyloric feeding tube placement for patients where gastric feeding intolerance is not solved with prokinetic agents[5].
8. Bowel management should be assessed daily in all patients and managed according to local policy guidelines.
9. EN should be continued in patients in prone position or supported with extracorporeal membrane oxygenation[5].
10. EN should be continued up until extubation, avoiding prolonged fasting, and continued post-extubation until the patient is able to meet nutritional needs orally[5].
11. Where risk of an unsafe swallow function exists an appropriately training individual should assess swallow function with the goal to commence early oral intake utilising therapeutic interventions as required.

BACKGROUND AND EXPLANATION

Every patient admitted to ICU requires assessment of nutritional status and risk which includes assessment weight (with consideration given to likely body composition and impacts of oedema) and ideal weight (based on height or ulnar length); food intake and absorption; causes of altered intake; and the possibility of specific micronutrient deficiencies (on ICU, most commonly being that of zinc in diarrhoea/dermatitis, and of B-vitamins in habitual excess alcohol intake). Oral enteral nutrition (EN) is the preferred route of feeding, where safe and adequate to do so.

It is important that the ICU has a nutrition support guideline which promotes protocolised nutrition delivery without waiting for a patient specific dietitian's plan, and which addresses vomiting, large gastric residual volumes, diarrhoea and failure to reach EN targets.

Nutritional intake targets need to be compared daily with actual intake, with deficits monitored, and steps taken to remedy them. The energy content from certain medications and fluids (e.g. propofol, IV glucose and citrate anti-coagulation renal replacement therapy) needs to be accounted for to avoid overfeeding.

Nutrition support is recommended to be instigated within 48 hours in patients expected not to be on a full oral diet within three days. EN support for inadequate oral intake helps meet macro- and micronutrient requirements, maintains gut integrity, supports immune function and reduces hospital-acquired infections[1,2]. If EN fails/is inappropriate, isocaloric parenteral nutrition (PN) delivery delivers similar outcomes[1,2].

Every ICU patient staying more than 48 hours needs to be considered at risk of malnutrition[1,3] and identified and graded using a nutritional assessment. Additional micronutrient requirements need to be met, and re-feeding syndrome avoided.

While an optimal feeding strategy is debated, an individualised approach after the first week is recommended[5,7]. Meeting early full energy/protein targets likely offers no benefit[8-10] and needs to be avoided in the first three days of admission/early phase of acute illness until clinical stability has been achieved[5,7]; administration can be increased after day three to meet full targets by day seven[1]. Indirect calorimetry (IC), the gold standard measurement of energy expenditure, is recommended[1,2]; predictive equations are inaccurate often leading to over/under-feeding[11]. If IC is unavailable, weight-based calculations are used (12-25kcal/kg/day in the first 7-10 days)[1,2].

Energy/protein requirements may rise during the (hard to define) recovery phase[5,7], but high-(2.2g/kg/day) and standard-dose (1.2g/kg/day) protein load deliver similar mortalities and times-to-discharge alive, while high-protein may harm those with acute kidney injury and the most severely-ill[9].

Micronutrients (trace elements/vitamins) in EN and PN[5] need to address existing deficiencies and meet ongoing needs (greater with active depletion e.g. losses via CRRT, intestine, surgical drains and burns[12,13]). Suboptimal EN delivery (e.g. from gastrointestinal dysfunction-related EN intolerance (ENI) is associated with greater duration of mechanical ventilation and ICU stay, and mortality[14,15]. Routine gastric residual volume (GRV) measurement, commonly used to assess GI dysfunction and ENI, correlates poorly with gastric emptying, regurgitation, and aspiration/pneumonia[16] and is not recommended in American guidelines[6]; European guidelines[5], however, suggest the use of post pyloric feeding and/or prokinetic agents (metoclopramide, erythromycin) if GRV >500ml.

Bowel management is an important aspect of gastrointestinal support. Local policy guidelines on daily bowel management assessment are recommended to include:

- Monitoring and documentation of bowel habits (frequency & type).
- Minimising the use of drugs that can cause constipation or diarrhoea.
- Assessing the need for, and performing, rectal examination to identify faecal loading/impaction and then to treat it.
- When to use laxatives, enemas, and suppositories.
- Management of ileus.

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3.10 Liver Support

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INTRODUCTION

Liver failure is a broad term which can be divided into four main sub-types. Identifying the correct type of liver failure is essential as there are significant differences in both the prognosis and available management options. The four broad types of liver failure outlined in this chapter with examples of the underlying aetiology.

Acute Liver Failure (ALF)	Encephalopathy + coagulopathy (INR > 1.5) in a patient with no pre-existing liver disease. The most common sub-types in the UK are hyperacute (often from paracetamol intoxication) or sub-acute (which can be seronegative or from auto-immune or other drug-induced liver injuries)[1].
Acute-on-Chronic Liver Failure (ACLF)	Decompensation and extra-hepatic organ failures in a patient with known advanced chronic liver disease / cirrhosis. This is often precipitated by a decompensating event such as sepsis, upper gastrointestinal bleeding or acute alcohol associated hepatitis[2].
Post-Hepatectomy Liver Failure (PHLF)	Liver failure following liver resection, often for a liver metastasis or primary liver cancer.
Liver Failure in multi-system illness	Liver failure in patients with a multi-system illness. This is perhaps best described as 'liver failure in the critically ill'. This may be as part of sepsis (predominantly cholestasis); low cardiac output states (ischaemic hepatitis); systemic disease such as malaria, dengue, macrophage activation or hemophagocytic syndrome; or infiltrative processes (malignancy).

Patients with ALF and PHLF are ideally managed in liver failure centres. Some patients with liver failure (e.g. those with ACLF and those with liver failure as part of a multi-system illness - like ischaemic hepatitis) are managed outside of liver failure centres but may benefit from specialist discussion with intensivists and liver specialists at the regional liver centre if there is diagnostic uncertainty.

MINIMUM STANDARDS

1. Contact with a liver transplant centre must be made early, following admission of any patient with ALF to an ICU[3].
2. ICUs managing liver failure and liver trauma must have access to a 24/7 interventional radiology service and/or be part of a network that can provide rapid access to such provision.
3. ICUs managing liver failure must have 24-hour access to both diagnostic and therapeutic upper GI endoscopy services and/or be part of a network that can provide rapid access to such provision.
4. ICUs managing liver failure must have an experienced intensive care pharmacist and dietitian.

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

1. ICUs managing liver failure should have a multidisciplinary team of intensivists and hepatologists, and access to input from other relevant specialties.
2. Patients with liver failure, plus any other organ dysfunction, should be considered for admission to intensive care.
3. Patients with non-ALF liver failure should be discussed early with the regional liver centre in consultation with the local hepatology service, if there is any diagnostic or management uncertainty.
4. Patients with ACLF should be discussed early with regional centres, as guided by consultation with the local hepatology service.
5. ICUs admitting patients with variceal bleeding should have agreed pathways to regional centres providing trans-jugular intrahepatic portosystemic shunt (TIPS) for patients with bleeding varices, ensuring early and timely access to such interventions.
6. Viscoelastic tests, such as thrombo-elastography or ROTEM, should be available to guide the use of blood products[4].
7. Strategies to prevent, monitor and manage intracranial hypertension (ICH) should be available in centres managing patients with ALF.

BACKGROUND AND EXPLANATION

Acute liver failure (ALF) is often used (incorrectly) as a generic term for liver dysfunction in the setting of critical illness. It is also used as a description of severe liver injury accompanied by organ failure seen in patients with chronic liver disease, more correctly termed acute on chronic liver failure (ACLF). Liver dysfunction, when seen as part of a multi-system illness, such as septic or cardiogenic shock, is more correctly referred to as hypoxic or ischaemic hepatitis or cholestasis of sepsis. These distinctions are important, as prognosis and management are different, and the definitions are clarified in the table above.

ICUs managing liver failure require a multidisciplinary team of intensivists and hepatologists and access to input from other relevant specialties, such as, liver surgeons, anaesthetists, infectious diseases, virology, cardiology, neurology and haematology as required. They can and should provide advice and liaison with intensive care patient transfer services as required.

Patients with liver failure, whatever the cause, need to be referred early to critical care outreach service for active review, discussion, assessment of prognosis, patient's wishes and expectations. Patients with liver failure should be considered for admission to an ICU. Attention is needed for cardiovascular support, rapid correction of actual or relative hypovolaemia, neurological assessment, and airway management, plus consideration of early renal and metabolic support.

Intravenous antibiotics need be considered in any liver failure patient with a suggestion of sepsis on admission to intensive care. Infectious complications are very common in patients with liver failure. The choice of antibiotic will be driven by knowledge of local microbiological resistance patterns.

Acute Live Failure additional considerations

ALF is a rare syndrome, estimated to affect between 2-5 people per million of the UK population each year. The most common cause in the UK is paracetamol toxicity. Cerebral oedema resulting in raised intracranial pressure can occur in those with high-grade encephalopathy (GCS < 8) and associated risk factors. In addition to supportive care, there is evidence that plasma exchange may be of benefit when instituted early in the course of the syndrome. Liver transplantation is indicated in a select group who fulfil poor prognostic criteria.

Changes in conscious level need to always be viewed as a serious development; encephalopathy is the most likely cause but metabolic causes, especially hypoglycaemia, need to be excluded. Early intubation for airway control and protection may be required, and almost always for transfer to another centre.

Pregnancy-related ALF presenting to the ICU is most likely to be Hemolysis, Elevated Liver enzymes and Low Platelets (HELLP) syndrome, pre-eclampsia, fatty liver of pregnancy or liver rupture. Consideration can also be given to Thrombotic Thrombocytopenic Purpura (TTP) and other microangiopathic haemolytic anaemias. Management of this cohort of patients requires effective and close working between obstetric services, neonatology and intensive care. Coagulopathy is often associated with bleeding in this disease group. (See Chapter 3.18 Care of the critically ill pregnant (or recently pregnant) patient).

ACLF, PHLF, ischaemic hepatitis and other Liver dysfunction additional considerations

Other patients with liver failure should be discussed early with the regional liver centre as guided by consultation with the local hepatology and intensive care service. Advice about management, prognosis, possible transfer, and interventions (TIPS, transplant, clinical trials) can be discussed, and clear lines of communication established.

ACLF is common and, whilst outcomes are continually improving, is still associated with a high mortality when >3 extra-hepatic organ failures are established. There is often a precipitant such as an upper GI bleed, alcohol associated hepatitis or infection, although none may be identified. The syndrome is characterised by worsening jaundice, coagulopathy and encephalopathy with an increasing extra hepatic organ failure burden carrying a worse prognosis. Renal failure in this setting carries a high attributable mortality. Initial care is supportive with a focus on managing any precipitant and treatment of sepsis. Patients with ACLF may now be listed and prioritised for liver transplant from the ICU, but outcomes are better if listed early. Patients with ACLF, who may be suitable transplant candidates, need to be referred early in their admission.

Bleeding from oesophageal varices carries a better prognosis than other precipitants of ACLF. Airway protection and endoscopic control of bleeding are essential, alongside consideration for TIPS early for refractory bleeding or if at high risk of re-bleeding.

Management of liver dysfunction in the setting of a multi-system disease is a broad area perhaps best described as 'liver failure in the critically ill'. Systemic infections and other inflammatory processes can precipitate severe liver dysfunction[5]. Malignant infiltration from lymphomas or overwhelming liver metastasis can sometimes present with liver failure. The list of other potential causes is long.

A cohort of patients present with signs and symptoms of liver failure due to a low cardiac output state and present as hypoxic hepatitis; their management will require focus on improved cardiac parameters recognising the liver as a secondary event. Heat stroke can present in a similar manner, with a hyperacute ischaemic injury (as may ecstasy and cocaine), these patients are hyperdynamic and have associated coagulopathy, rhabdomyolysis and multiple organ failure, often with GI failure and severe diarrhoea.

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3.11 Neurological Support

Authors: Jessie Welbourne, Zoeb Jiwaji & Donna Rawlings

INTRODUCTION

The provision of specialist services for stroke, neurotrauma, and other neurological conditions is progressively becoming centralised. However, many patients with acute brain and spinal cord pathology will present to and require neurological support within non-specialist ICUs. This includes those admitted following out-of-hospital cardiac arrest, seizures, stroke, neuroinfective and neuroinflammatory disorders.

Clinical guidance on the intensive care management of specific neurological conditions is outside the scope of this chapter. The focus here is on the service provision of neurological support, which includes referral pathways, and admission and discharge to ICU. This chapter should be considered alongside and complements the standards and recommendations within Chapter 1.9 Neurocritical Care.

MINIMUM STANDARDS

1. Treatments, including transfer for specialist neurological interventions, must be in line as far as possible with individual preferences, including consideration of Advance Care Plans or Anticipatory Care Plans (Scotland) if applicable[1].
2. Local guidance for the management of patients who remain unconscious following cardiac arrest must be available and in accordance with national and international consensus[2].
3. Patients admitted to intensive care with intracerebral haemorrhage must be discussed with neurosurgical or stroke care specialists for consideration of, and transfer for appropriate specialist interventions[3].
4. Adults with middle cerebral artery infarction admitted to intensive care, meeting the criteria described in NICE NG128 must be discussed with a specialist centre for consideration of decompressive craniectomy within 48 hours of symptom onset[3].
5. Diagnosis of death using neurological criteria must be conducted as per the Academy of Medical Royal College's Code of Practice and the endorsed national testing forms[4].

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

1. Agreed access and documentation processes should be in place for neuro intensive care, neurosurgery and neurology specialist advice when required[5].
2. Patients with perceived devastating brain injury should be admitted to intensive care to aid prognostication as per national consensus guidance, unless the extent of co-morbidity makes continued organ support of no overall benefit regardless of potential neurological recovery[6].
3. EEG monitoring should be available for patients with refractory generalised status epilepticus[7,8].
4. Assessment and management of patients with prolonged disorders of consciousness should follow national guidance, including specialist input from an expert Prolonged Disorders of Consciousness Physician[9].

BACKGROUND AND EXPLANATION

Patients requiring neurological support are frequently encountered in intensive care settings, with many not necessitating transfer to a specialist neurosciences centre. Alongside relevant neurological investigations and interventions, it is important to recognise that patients in this group derive substantial benefit from expert general intensive care encompassing optimal ventilation, oxygenation, cardiovascular support, sedation management, nutritional provision, and VTE prophylaxis strategies.

In addition, individuals needing neurological support may also require specific treatments tailored towards neuroprotection and management of neurological diagnoses. A key challenge is predicting long-term outcomes following neurological injury, with an emphasis on using evidence-based and patient-centred approaches to guide both treatment and end-of-life decision-making.

Given the nature and occasional rarity of certain neurological conditions, regional policies and intensive care networks are advised to facilitate the management of neurological patients at non-specialist facilities, including (but not limited to) refractory status epilepticus, autoimmune encephalitis[10], acute inflammatory polyneuropathy[11] and decompensation of chronic neurological disease, with prompt transfer to specialised centres when specialist intervention is warranted.

Some important clinical guidance references on the management of specific neurological conditions are provided below to help inform local guideline development.

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Meningococcal disease

National Institute for Health and Care Excellence. Meningitis (bacterial) and meningococcal disease: recognition, diagnosis and management. NICE guideline NG240. Published: 19 March 2024.

Post cardiac arrest care

Nolan, J. P. et al. European Resuscitation Council and European Society of Intensive Care Medicine Guidelines 2021: Post-resuscitation care. Resuscitation 161, 220–269 (2021).

Seizures

Glauser, T. et al. Evidence-Based Guideline: Treatment of Convulsive Status Epilepticus in Children and Adults: Report of the Guideline Committee of the American Epilepsy Society. Epilepsy Curr. 16, 48–61 (2016).

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3.12 Infection Control

Authors: Thomas Craven & Melanie Griffiths

INTRODUCTION

ICUs bring together patients who are more vulnerable to acquiring nosocomial infections and more likely to receive broad-spectrum antibiotics. Breaking the chain of infection with comprehensive infection prevention and control (IPC) measures is essential to reduce the burden of infection and the development and spread of antimicrobial-resistant infections[1]. Many infection control practices such as hand hygiene, environmental cleaning, antimicrobial stewardship, isolation prioritisation and surveillance strategies apply throughout all healthcare locations, with intensive care having specific or distinct requirements.

MINIMUM STANDARDS

1. ICUs must identify an embedded ICU nurse who has protected time to carry out IPC duties on intensive care.
2. ICUs must comply with national standard infection control precautions (SICPs) and transmission-based precautions (TBPs), adapted if necessary, according to local need.
3. All patients must undergo a clinical risk assessment for Carbapenemase-producing Enterobacterales (CPE) screening at admission to intensive care.
4. All patients must be screened for carriage of Methicillin Resistant Staphylococcus aureus (MRSA) at admission to intensive care and those identified as MRSA positive be offered topical decolonisation/suppression.
5. ICUs must comply with Infection Prevention Society High Impact Interventions or equivalent, adapted if necessary, according to local need*.
6. ICU patients must have scheduled and predictable weekday interactions with a microbiologist (or equivalent).
7. ICUs must contribute to national surveillance of nosocomial infection through local surveillance and reporting.

* Except those dealing with prevention of surgical site infection.

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

1. ICUs should identify a clinical lead for infection control, which includes a responsibility for ICU antimicrobial stewardship.
2. All patients should undergo a clinical risk assessment and, if necessary, screening for other pathogens as locally appropriate at admission to intensive care.

BACKGROUND AND EXPLANATION

Infection prevention and control strategy is set at a national level, and national infection control manuals define SICPs and TBPs which comprehensively describe many important aspects of infection control such as hand hygiene, environmental cleaning, personal protective equipment, and patient isolation. Compliance is mandatory for all health care locations and trust/health board wide infection control teams are responsible for setting and delivering local strategy. ICUs are exceptional because, primarily, their patients and treatments present additional routine risk. A formally recognised nursing role embedded within the ICU is considered a minimum acceptable standard to ensure adequate delivery of infection control practices at a unit level; as well as advocating for better practice, perform education, promote antimicrobial stewardship, conduct surveillance, and develop unit specific IPC initiatives. High quality units will also appoint a clinical/medical lead from amongst the ICU consultant body to promote and augment these same activities, providing additional time and face validity for this important work, and an additional point of communication for medical staff outside of ICU. ICUs utilise many invasive devices that are associated with additional risk for healthcare associated infection[2].

The Infection Prevention Society has published several iterations of High Impact Interventions[3] based on evidence, guidelines, legislation, and expert consensus. The interventions describe care bundles for the insertion phase and ongoing care phase of the following:

- Prevention of ventilator-associated pneumonia.
- Prevention of infections associated with:
    - peripheral vascular access devices

  - central venous access devices
  - infections in chronic wounds
  - urinary catheters.
- Promotion of stewardship in antimicrobial prescribing.

The interventions also cover the prevention of surgical site infection but, whilst important in ICU, the specific interventions described cover the pre- and intra-operative phases of surgery only. For this reason, the application of the associated care bundles is not often directly applicable in ICUs, and so they are exempt from these standards. The elements of each care bundle are succinct and auditable. ICUs can adapt and evolve their care bundles in line with local need and new evidence. In addition to prevention, surveillance of common and harmful device associated infections is a component of the strategy to reduce their morbidity and units should conduct surveillance as required by their national reporting system.

CPE are amongst the highest threat of all emerging pathogens[4], forming a subdivision of carbapenem resistant organisms (CRO). CPE are spread through direct and indirect contact with the patient and their environment, so screening can identify patients and reduce the risk of transmission to others in the ICU. Each patient needs to undergo a risk assessment at the time of admission; the components of the risk assessment are set nationally and may evolve with time. MRSA carriage, mortality, and morbidity have fallen[5] over the last two decades at least in part due to an effective screening and eradication strategy. All patients admitted to high-risk areas (including intensive care) must be screened for MRSA carriage and eradication/suppression offered to those with positive screening results[6]. Additionally, all patients should undergo a clinical risk assessment and, if necessary, screening for other pathogens as locally appropriate at admission to intensive care. For example, *Candidozyma auris* is a species of yeast, designated as a critical priority fungal pathogen by the World Health Organization in 2022, which has also developed resistance to many available classes of antifungals and has been responsible for colonisation and severe infections in critically ill patients in the UK. The UKHSA[7] has recently published recommendations regarding the screening of high-risk patients, who should be identified using a clinical risk assessment at admission to ICU.

Antimicrobial resistance (AMR) is predicted to result in 10 million deaths globally by 2050 if no action is taken[8]. Antimicrobial stewardship (AMS) is a key cornerstone in reducing AMR. along with adherence to UKHSA 'Start Smart then Focus' and WHO guidance 'AWaRe'[9]. Antibiotic treatment ought to be used only when clearly indicated, reviewed daily, rationalised when possible, and discontinued as soon as it is no longer needed. AMS applies within and beyond ICU and is often complex, involving many individuals from several professions and disciplines, making it difficult to define easily which ICUs are good antimicrobial stewards and which are not. A simple but key component of ICU, AMS requires regular interaction between patients, intensive care professionals, microbiologists, and pharmacists to check adherence to local antimicrobial policy and provide case-specific advice including dose adjustment.

There are no standalone actions to prevent infection. IPC activity needs to be multifaceted and continuous[10].

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3.13 Major Trauma

Authors: Adam Wolverson, Dean Kerslake & Ronan O'Leary

INTRODUCTION

The management of major trauma has been transformed in the UK by the development of major trauma networks centred on regional Major Trauma Centres (MTC) acting as a hub for the associated Major Trauma Units (TU) located in peripheral hospitals[1,2]. When measured by excess survivors, these structural changes have led to significantly improved outcomes for patients who sustain life-threatening traumatic injuries[3].

Intensive care has been central to that transformation and represents the nexus for the co-ordination of high-quality interventions following major trauma. It is therefore essential that each ICU develops strong, productive, and collaborative links with the relevant specialties and with the wider regional trauma and critical care networks.

This chapter is focussed on providing standards and recommendations that enhance team working, collaboration, and resilience within this demanding clinical sphere. As such, it articulates a framework for infrastructure, staffing, and operational pathways as the key components for a high-quality intensive care service treating patients suffering from major trauma.

MINIMUM STANDARDS

1. Patients accepted to an MTC must not be delayed due to lack of intensive care capacity.
2. Each MTC ICU must have a nominated lead consultant and lead nurse for major trauma.
3. Each MTC ICU must have guidelines for the multi-specialty and multidisciplinary management of major trauma as determined by the major trauma network.
4. ICUs caring for major trauma patients must facilitate appropriate multidisciplinary services for trauma focussed care and rehabilitation. (see Chapter 3.20 Rehabilitation)

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

1. Each critical care network or equivalent should develop and implement a trauma intensive care clinical advisory service, led by the MTC, where the intensive care clinicians at the MTC can support the care of patients with traumatic injuries admitted to TUs.
2. Each TU should have named link consultant intensivist and senior ICU nurse to facilitate liaison and other interactions with the MTC ICU.
3. Nurses caring for major trauma patients in intensive care should have undertaken the appropriate trauma focussed training and achieved the required competencies.
4. There should be a specific intensive care trauma quality improvement programme within each MTC.
5. Movement and positional restrictions and advice, for example following spinal or pelvic fractures, should be reviewed daily by the relevant specialist team with the objective of relaxing the restrictions as early as possible.
6. Trauma patients in intensive care should be considered for recruitment into trauma-specific research studies.
7. Patients should be repatriated from the MTC to their local TU, between ICUs, when the acute phase of trauma care has been completed.
8. Where ICU to ICU repatriation is appropriate, it should be completed within 48 hours of acceptance.
9. ICUs should participate in local and regional Emergency Preparedness, Resilience and Response (EPRR) planning.
10. ICUs should be able to demonstrate participation in simulations and exercises focussed on major incidents involving multiple trauma causalities.

BACKGROUND AND EXPLANATION

Following a series of reports which articulated clear deficits and unwarranted variations in major trauma care that had been associated with poor outcomes, NHS England established 22 major trauma networks centred on Major Trauma Centres (MTC) acting as a hub around the clustered Major Trauma Units (TU) in peripheral hospitals[1,2]. Subsequently, this system has become established throughout Wales, Scotland, and Northern Ireland.

The core aspects of high-quality provision of intensive care for major trauma patients are described in a variety of commissioning standards or specialist guidelines. These include the *NHS England Major Trauma Service Specification*[4], the *NICE Major Trauma Service Delivery Standard*[5], NICE head injury guidance[6], GIRFT and the critical illness[7] and trauma

rehabilitation standards[8]. Relevant guidelines include the *American College of Surgeons Trauma Quality Improvement Programme (TQIP)*, the *European Guidelines on the Management of Major Bleeding and Coagulopathy Following Trauma*[9], and the *Western Trauma Association Guidelines to Reduce Venous Thromboembolism in Trauma Patient*[10], amongst many others.

Conceptually, major trauma may be considered as a multi-system, systemic pathological syndrome within which the patient is subject to the consequences of the initial injuries and then the complications and sequalae of those injuries. The most severe patients, judged by Injury Severity Score, have to be admitted to a MTC ICU where management spans three overlapping phases: resuscitation and injury management, avoidance of secondary complications, and recovery and rehabilitation.

The multi-system nature of trauma care requires a multidisciplinary approach comprising medical and nursing specialties with physiotherapy, occupational therapy, dietetics, trauma psychology (where families and staff are also supported), speech and language therapy, and rehabilitation. Such efforts are supported by local and regional multidisciplinary trauma education (such as the NMAHP framework in Scotland), trauma clinical governance, within trauma focussed quality improvement and research landscapes.

The consultant intensivist's role is to conduct the procession of interventions, monitoring, and treatments in the most effective and efficient way possible by balancing the need for physiological optimisation with the pressing requirements for imaging and surgery. ICUs need to develop a shared ethos with their partner specialties, which is reflected in local policies, that reduce variation in care and decrease the accumulation of secondary insults, for example by encouraging shorter, less invasive approaches for the management of long bone fractures in the presence of severe traumatic brain injury[11].

Finally, in any resource constrained system, intensivists will need to balance the demands on the service with the available capacity. Patients are likely to benefit the most from specialist intensive care during the earliest phases of treatment following injury and, once accepted to an MTC admission must not be delayed. In contrast, it may be necessary to balance the population need to provide a high tempo of admissions with the capability to repatriate patients to TUs, in line with ICS transfer guideance[12], providing that there is sufficient infrastructure at the receiving hospital to ensure that the patient's recovery and rehabilitation will not be compromised.

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3.14 Inter- and Intra-Hospital Transfer of the Critically Ill Adult Patient

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INTRODUCTION

Intra-hospital (within the hospital) transfer of critically ill (both illness and injury) patients includes transfer from the Emergency Department and Theatres to the ICU as well as journeys to diagnostic and therapeutic areas. There are approximately 35,000 inter-hospital (between hospitals) adult intensive care transfers per annum[1,2,3], the majority being escalations of care to access specialist services (time-critical, urgent or planned) and the remainder repatriation, continuation of care and capacity transfers.

The same high standards of intensive care must be provided during any transfer regardless of type of hospital (NHS and Independent Sector), location within the hospital, type of transfer, urgency and transferring team[4,5,6].

MINIMUM STANDARDS

1. Transfer for immediate lifesaving interventions (time critical interventions) must not be delayed or prevented by the availability of an intensive care bed.
2. The decision to undertake inter-hospital transfer must be made jointly by consultants at the referring and receiving hospitals.
3. There must be documented evidence of a risk assessment prior to any transfer (inter or intra).
4. All clinical team members involved in the transfer (inter or intra-hospital) of critically ill patients must be trained and competent in intensive care transfer.
5. Critically ill patients requiring transfer must receive the same level of monitoring as they would within an ICU.
6. Critically ill patients requiring transfer must have the same level of documentation as they would within an ICU.

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

1. Where dedicated Adult Critical Care Transfer Services are available, all referrals for inter-hospital transfer of critically ill or injured patients should be made to these services.
2. Patients requiring repatriation to their local hospital to continue care should be transferred within 48 hours of acceptance by the receiving hospital.
3. ICUs should have a lead consultant responsible for intensive care transfer who oversees education and training, governance arrangements, audit and quality improvement initiatives and data analysis to ensure that patients undergoing intra- and inter- hospital transfer receive the same quality care.
4. Acute hospitals should have access to a CEN compliant intensive care transfer trolley with appropriate equipment securely mounted to it, which is regularly checked and serviced.
5. Acute hospitals should have dedicated intensive care transfer equipment and drugs bags that contain at least the minimum stock detailed in the *Guidelines on the Transfer of the Critically Ill Adult 2026*[4].
6. Dedicated intra- and inter-hospital transfer checklists should be used throughout the transfer process to ensure adequate preparation and to enhance patient and accompanying staff safety (available in the *Guidelines on the Transfer of the Critically Ill Adult 2026*)[4].

BACKGROUND AND EXPLANATION

Since the publication of GPICS V2, the intensive care transfer landscape has changed immeasurably. Until recently, transfer of adult intensive care patients was largely ad-hoc and relied heavily on NHS ambulance providers and, most often, clinicians with varying experience of intensive care transfer from referring hospitals. The COVID-19 pandemic paved the way for the permanent commissioning and development of dedicated Adult Critical Care Transfer Services (ACCTS) in England and Wales, mirroring the services already operating in Northern Ireland and Scotland. It is expected that, in the near future, all patients will have access to a dedicated ACCTS wherever they are in the UK, at any time of day.

The development of ACCTS and wider experiences during the COVID-19 pandemic have transformed the focus on intensive care transfer and thus have shaped the standards and recommendations described above. In 2025, the 2019 FICM/ ICS 'The Transfer of the Critically Ill Adult Guidelines' is being comprehensively rewritten to reflect these changes and their contents applied to all patients.

The improved organisation and focus on intensive care transfer means that acute hospitals, health boards/trusts, ACC networks and ACCTS (where they are operational) have to work collaboratively. A national minimum mandatory dataset (MMDS) for inter-hospital transfers, much like the ICNARC Case Mix Programme dataset, has been developed within England and needs to be submitted for all inter-hospital transfers of adult patients. Collaborative working with the devolved nations will ideally enable a MMDS to be submitted for all inter-hospital transfers in the UK in future. Clinical governance processes to ensure incident reporting, thematic review and shared learning need to be core elements of regional networks, health boards and ACCTS.

All patients requiring intensive care transfer within or between hospitals must have the same high standards of care regardless of where they are being transferred and regardless of who the transferring clinical team are. It is now expected that transfers are led by appropriately trained, competent and experienced clinicians with competencies from FICM, RCoA and UKCCNA evolving to reflect these changes. Formal documented risk assessment is required for any transfer and needs to include the patient's physiological status, likelihood of changes or deterioration, the transfer proposed and the required competencies, seniority and experience of the transferring clinical team. The lead consultant responsible for intensive care transfer is responsible for ensuring these requirements are met and where able, work collaboratively with regional networks.

Transfer of patients for immediate lifesaving interventions (time critical interventions) must not be delayed or prevented by availability of an intensive care bed. Receiving hospitals must accept such patients, perform the life-saving intervention then consider the safest and most appropriate location for ongoing care. This may include further transfer to another centre for ongoing treatment and care.

Networks, health boards/trusts and NHS regions need to ensure that there are operational guidelines/principles set out to guide acute hospitals in decision making around capacity transfer to ensure patient-centred decisions are made (e.g. transfers only occur once all physical beds are occupied and staffed, all elective surgery cancelled, all ward-fit patients discharged from critical care, all reasonable efforts made to temporarily increase staffing, and no prospect to increase staffing by the oncoming shift).

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3.15 Legal Aspects of Capacity and Decision Making

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INTRODUCTION

It is assumed that all adult patients have capacity to make decisions about their treatment – i.e. to give or withhold consent, or to choose among the available options - unless proven otherwise. If a patient has that capacity, their decision has to be respected, even if the treating clinician considers that decision to be unwise. Autonomy or self-determination is a fundamental principle of human rights and a cornerstone of medical law. Advance Care Planning (ACP) can be used to promote self-determination by documenting an individual's wishes prior to a potential loss of decision-making capacity.

Decisions involving patients who lack capacity, have to be made as per the requirements and principles laid out in the relevant home nation's capacity legal framework[1,2,3]. When disagreement occurs between the treating team and the patient/family, conflict management is paramount to ensure optimal care and avoid moral conflict or acting unlawfully.

MINIMUM STANDARDS

1. Determination of capacity for a specific treatment/refusal of treatment must be made and communicated by the treating clinician in accordance with the relevant legal framework for capacity, that is applicable to the UK Home Nation, in which the patient is being treated[1-5].
2. The basis for all treatment decisions regarding patients who lack capacity must be documented and be specific to the proposed intervention.
3. When the patient has validly made choices in advance (by way of making an advance decision to refuse treatment, an advance statement of their wishes, or in England, Wales and Scotland, by appointing an attorney) every effort must be made to implement those choices.
4. All efforts must be made to allow critically ill patients to exercise their capacity.
5. ICM consultants must have 24-hour access to the organisation's legal team, with clear and specific local guidance detailing how to request legal advice.

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

1. ICUs should provide regular training for staff, outlining how to undertake capacity assessments in intensive care for the management of patients who may lack capacity.
2. Capacity is decision and time specific, and capacity should be assessed with the level of care that is commensurate with the nature/severity of the decision.
3. Where decisions involving capacitous patients may lead to serious consequences, senior doctors should be involved in assessing capacity.
4. ICUs should have access to a second opinion from a senior doctor, external to the organisation and mediation services, in the event of disagreement.
5. In cases of intractable conflict, staff support should be provided in the form of debrief, psychological interventions or wellbeing advice.

BACKGROUND AND EXPLANATION

Capacity is time and decision specific and may fluctuate, especially in critically ill patients, consequent to their acute clinical condition and/or the treatment provided. It is therefore key to safe, ethical, and lawful practice that staff understand the legal principles that underpin capacity assessment. Capacity needs to be assessed with the level of care that is commensurate with the nature/severity of the decision. Where decisions involving patients who have capacity may lead to serious consequences e.g. the withdrawal of life sustaining treatment, senior clinicians should be involved in assessing capacity, a second opinion is strongly recommended along with repeating the capacity assessment.

At any given time, a patient may have capacity for one decision but lack it for a different one. Furthermore, capacity can be difficult to assess in critically ill patients, whose ability to communicate may be restricted or impaired. In such cases, conditions need to be optimised for critically ill patients to exercise their capacity e.g., via the use of relevant communication aids, language translators and/or the provision of information in a suitable format.

The documentation for all treatment decisions regarding patients who lack capacity will include details regarding:

- The determination of best interests/benefit, which has to be patient-centred and include an evaluation of the potential risks vs benefits. Best interests are not confined to medical issues and have to encompass other aspects, such as religious beliefs, wishes and values.
- The conversation(s) undertaken between the treating consultant and individuals close to the patient (family and friends), or where applicable the patient's legal representative, the Mental Welfare Commission (Scotland) or IMCA (England and Wales).
- Whether there is a change in the patient's capacity to make relevant decisions during ICU admission.

If the patient has made a valid and applicable Advance Decision to Refuse Treatment (ADRT), it has to be respected[1,4]. This is particularly relevant where life sustaining treatment is being withheld on the basis of an ADRT. In this situation, there can be no doubt as to its validity or applicability; where debate or concerns exist, seeking early legal advice is prudent, along with providing emergency life sustaining treatment in the interim (N.B., although ARDTs do not have formal statutory authority in Scotland or in Northern Ireland, they are likely to be highly persuasive to the court).

Disagreement and Conflict

Disagreement and conflict in ICU are inevitable, given the high emotional burden of the acute illness and the life-or-death decisions that are frequently made. A deeper understanding of why conflict occurs may allow ICU clinicians to recognise and challenge their own cognitive biases, as well as those of patients' relatives, thus preventing escalation of conflict when it does occur[6]. When this is not possible, there are options to resolve conflict with external input, either in the form of a second opinion from a senior doctor, mediation or an application to the courts. Written local guidance regarding how to enact these interventions is recommended.

Parties ought to seek alternative dispute resolution methods, the learnings from which can be applied to various healthcare settings (as illustrated in recent case law examples in England and Wales). Increasing attention has since been given to other ways of resolving conflict before it reaches the courtroom. Mediation has been proposed as a non-adjudicative process, which promotes communication and mutual understanding instead of confrontation and a 'right/ wrong' stance. Despite conceptual benefits, concerns still exist around the regulation of the mediation process and further research is needed into its effectiveness in the medical setting.

In cases of conflict and significant disagreement staff support should be provided in the form of debrief, psychological interventions or wellbeing advice. Units should be proactive and develop policies to ensure such support can be promptly delivered.

There are three main legal jurisdictions in the UK; England and Wales, Scotland, and Northern Ireland; each with its own legal system, which includes capacity legislation (N.B., in Northern Ireland, the Mental Capacity (Northern Ireland) Act 2016 is not yet fully implemented and currently does not cover treatment decisions). The UK Supreme Court is the final appellate court for all three jurisdictions and its decisions bind all lower courts wherever they may be located. Treatment for patients who lack capacity will be either in accordance with their best interests (England and Wales, Northern Ireland) or of overall benefit (Scotland). If legal advice is required, all healthcare organisations, NHS trusts and health boards have a legal services department and/or access to external solicitors.

The UK Supreme Court has made clear that in England and Wales, if at the end of the process of decision-making for patients who lack capacity, it is apparent that the way forward is finely balanced, or there is a difference of medical opinion, or a lack of agreement to a proposed course of action from those with an interest in the patient's welfare, an application should be made to the Court of Protection[7,8]. A comparable approach is likely to be applicable to the relevant courts in Scotland and in Northern Ireland, and the same criteria should be used for legal advice. The Courts have said repeatedly that the initial application should come from the health body and not from the family.

The Deprivation of Liberty Safeguards (in England and Wales, and Northern Ireland) will rarely be a relevant issue for critically ill patients requiring emergency interventions[9]. The courts have emphasised in England and Wales that in emergency life-threatening situations, the priority for patients who lack capacity is to ensure that care is delivered in accordance with their best interests, and this is not usually to be treated as a matter of deprivation of liberty[10]. At the time of writing, no directly equivalent safeguards apply in Scotland.

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3.16 Managing Acute Severe Behavioural Disturbances

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INTRODUCTION

Acute severe behavioural disturbance is an umbrella term with no formally agreed consensus definition. Broadly speaking, it refers to individuals with acute severe agitation and abnormal physiology and encompasses (but is not limited to) conditions currently, or previously described as acute behavioural disorder and agitated, or excited delirium[1]. Patients, and occasionally relatives, displaying acute severe behavioural disturbances place themselves, staff and other patients at risk and often require significant resource utilisation. Rapid tranquilisation may be required in patients displaying extreme agitation, violence and aggression, who do not respond to verbal de-escalation techniques or oral agents, to ensure that the patient, staff, and others are safe, and to achieve appropriate clinical investigation and management within the ICU.

Violence and aggression in healthcare settings, including in ICU, is common. This may be displayed by visitors, in addition to patients. The Health and Safety Executive defines work-related violence as "any incident in which a person is abused, threatened, or assaulted in circumstances related to their work"[2]. The remit of this chapter therefore extends beyond the management of patients alone and encompasses standards and recommendations for any instances of violence and aggression within the ICU.

MINIMUM STANDARDS

1. ICUs must have a guideline for the management of patients with acute severe behavioural disturbance, including rapid tranquilisation.
2. ICUs must have policies in place for the management of visitors to the unit who display violence and aggression.
3. ICUs must have written guidance for the use of patient restraint[3].
4. Appropriate patient monitoring must be used when rapid tranquilisation methods are deployed[1,4].
5. ICUs must have 24/7 immediate/rapid access to personnel who have training in de-escalation and, where appropriate, physical restraint.
6. A capacity assessment must be undertaken on a patient, in accordance with the relevant UK Home Nation's capacity legal framework, prior to the administration of rapid tranquilisation and/or restraint[5-7] and recorded in the medical records at the earliest opportunity.
7. ICUs must have 24/7 access to emergency mental health services.

RECOMMENDATIONS FOR A QUALITY SERVICE

1. All senior medical and nursing staff should receive de-escalation training.
2. ICUs should consider training senior medical and nursing staff in the use of safe physical restraint in the clinical setting.
3. All ICUs should have personnel trained in supporting staff who have been involved in caring for patients/relatives with acute severe behavioural disturbances.
4. ICUs should be able to surge their staffing capacity to 2:1 or even 3:1 nursing/HCA capacity when managing patients with acute severe behavioural disturbance.

BACKGROUND AND EXPLANATION

A recent modified Delphi study identified patients with acute severe agitation, who are at particular risk of physiological deterioration (including cardiac arrest), as those who display the triad of: tactile hyperthermia (being hot to touch), exhibiting constant or near-constant activity, and extreme agitation or aggression[8]. Other factors indicative of severity included progressive physiological derangement and a requirement for doses of sedation that may result in respiratory depression, or airway compromise. Intubation and ventilation may need to be considered for patients most at risk.

Although commonly related to recreational drug use or withdrawal, a wide range of clinical conditions can cause acute severe behavioural disturbance and may need to be included in the differential diagnoses. Specific treatments need to be considered where appropriate e.g. management of alcohol or drug withdrawal, or serotonin syndrome.

Restraint techniques are only be used for patients who lack capacity, or if consent has been given by patients who have capacity (the caveat to this being that if steps are immediately necessary to protect others from the risk of significant harm, then proportionate restraint can be used, irrespective of the patient's capacity). For all modes of restraint, a risk assessment needs to be undertaken. Physical restraint may increase the risk of complications in patients with acute severe behavioural disturbances[9]. Restraint techniques need to be deployed in accordance with the relevant UK Home Nation's capacity legal framework (i.e. following an assessment of best interests, or overall benefit), by appropriately trained staff[7]. If the patient lacks capacity to consent to being restrained, restraint is lawful if it is necessary and proportionate to the risk of harm they would suffer otherwise. That harm can include not receiving the treatment required to address the causes of their acute behavioural disturbance. In emergency life-threatening situations, a deprivation of liberty situation is unlikely to occur[10,11]. However, where ongoing restraint is required, attention does need to be paid to deprivation of liberty safeguards[3,11] (at the time of writing, these only apply to England & Wales and Northern Ireland, as no directly equivalent safeguards currently exist in Scotland).

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3.17 Care of the Chronically Critically Ill Patient

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INTRODUCTION

A significant number of patients admitted to ICU will require a prolonged period of organ support and a protracted ICU stay; these patients can be described as 'chronically critically ill'. Whilst underlying drivers of prolonged admission vary (e.g. underlying diagnosis, persistent critical illness, persistent inflammation, immunosuppression and catabolism syndrome)[1], these patients face common specific challenges during their ICU admission and post-ICU recovery that exceed the complex rehabilitation needs of all ICU patients considered in Chapter 3.20 Rehabilitation. In the absence of consensus definition of the chronic critically ill, we suggest any patient with an ICU length of stay of greater than 10 days is managed according to the following minimum standards and quality recommendations[2,3].

MINIMUM STANDARDS

1. A robust process must be in place within each ICU to identify patients with, or at risk of, chronic critical illness.
2. A named senior member of the clinical team must be identified to coordinate and lead a multidisciplinary team, responsible for the care of chronically critically ill patients.
3. Resource demands and needs of all chronically critically ill patients must be audited in line with departmental clinical governance frameworks.
4. A weekly multidisciplinary patient review of all patients with chronic critical illness must occur using a standardised clinical tool.
5. Goals and care plan aims from the multidisciplinary patient review must be clearly recorded in the medical notes.
6. There must be documented discussions with the patient and their nominated family and friends on expected prognosis, outcomes and the degree of associated morbidity and with the referring clinical team[4].

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

1. A personalised rehabilitation plan, informed by a standardised clinical tool, should be available.
2. A copy of the rehabilitation plan should be provided at the point of ICU discharge to the receiving team, patient and their family and friends[3,4].
3. Services should utilise recognised key performance indicators which include both patient-reported outcome measures and patient/family and friends reported evaluation measures.
4. Visits from the ward multidisciplinary team and visits to receiving clinical areas should be considered to support the transition from ICU areas after discharge[5].
5. Prior to ICU discharge, a decision reached in discussion with the patient and their family and friends regarding readmission to ICU should be recorded and communicated as part of handover[4].

BACKGROUND AND EXPLANATION

Improvements in diagnostics and treatments have led to improved survival rates, resulting in an increasing number of long-stay patients with significant ongoing physical and psychological care needs[2]. Careful attention to the management of pre-existing comorbidities for the care of the chronically critically ill during transitions of care may help reduce healthcare utilisation after intensive care discharge[6]. Though a relatively small cohort, those with chronic critical illness can account for significant proportion of intensive care capacity[3]. Whilst the majority of ICU patients will have complex rehabilitation needs, this group faces some very specific additional challenges around coordination of care related to issues including (but not limited to) exacerbation of chronic diseases by critical illness, muscle wasting, delirium, pain, secondary complications and the expectations of the patient, their family and friends and the referring team.

A weekly multidisciplinary patient review is needed to identify patient needs and the resources required and improve outcomes[7]. This needs to be regularly documented, audited, and processes be in place to evaluate patient and service level outcomes, including patient reported outcome measures (e.g., EQ-5D-5L, PICUPS) amongst other evaluation measures for early identification of rehabilitation needs[8,9]. Interviews with patients, their family and friends may also be of benefit[10].

Learning from major trauma has demonstrated the benefits of involving patients, with their families, friends and carers (as appropriate), in assessments, in planning their coordination of care and in making decisions at all stages of the

rehabilitation process, including decisions around readmission in the event of deterioration[11]. It is particularly important in this patient group because of the potential conflicting opinions on realistic outcomes between patients, their family and friends, referring teams and the intensive care team[4].

Individualised rehabilitation plans should be available and updated throughout the recovery continuum; these provide the patient with a summary of their ongoing rehabilitation needs and planned interventions[11,12]. Standardised rehabilitation assessments such as the PICUPS can aid the recognition of ongoing needs, and potential disciplines required[11]. Visits out of ICU can be very beneficial to patients and their family and friends in preparation for discharge[5].

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3.18 Care of the Critically Ill Pregnant (or recently pregnant) Patient

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INTRODUCTION

The term 'maternity patient' refers to anyone who is pregnant or has been pregnant within the last 42 days, including those who have experienced pregnancy loss or miscarriage.

Evidence to support this document comes from a variety of national reports and guidelines based predominantly on expert opinion and consensus. It is important to note that Level 1 care, enhanced maternal care (EMC), is increasingly being provided in a maternity setting. In areas where Level 2 or 3 care is being provided, GPICS will apply. In certain contexts, enhanced maternal care may be extended to encompass elements of Level 2 care on the delivery suite, keeping patient and baby together for more of the time. Any provision beyond enhanced maternal care should adhere to wider GPICS standards, for example through a formal shared-care agreement between maternity and intensive care services.

Whether in the delivery suite, ward, or ICU, no single location or team can address all needs. Consequently, effective care requires a collaborative approach, uniting services at the patient's location with patient-centred management strategies that are tailored and adaptable to their evolving needs[1-4].

MINIMUM STANDARDS

1. ICUs admitting maternity patients must be prepared for obstetric emergencies such as unplanned birth, postpartum haemorrhage, and maternal cardiac arrest[5].
2. All intensive care services (including outreach) caring for maternity patients must appoint a named lead clinician and a lead nurse for maternal critical care[1,3,6].
3. All maternity patients admitted to intensive care must have evidence of a clearly documented, multidisciplinary, intensive care, obstetric and anaesthetic consultant-led review at least once every 24 hours[3].
4. Intensive care services must establish a clearly defined 24/7 escalation route for maternity patients to access intensive care, including from enhanced maternal care units when they have separate oversight[2,6,7].
5. Local measures must be in place to promote and facilitate breastfeeding, including milk expression, and to ensure routine contact between the patient and their newborn whilst receiving intensive care[2,3].

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

1. Each ACC network (or equivalent) should develop a strategy for regional maternal critical care provision[3,7].
2. Each ACC network (or equivalent), should appoint a clinical lead for maternal critical care to liaise with the regional maternal medicine network (regional lead clinicians for maternal medicine where unavailable), assist in developing escalation pathways, support coordinated quality improvement and educational initiatives[3].
3. For maternity admissions to intensive care expected to exceed 48 hours, a documented multidisciplinary discussion should involve regional expertise in maternal medicine and maternal critical care, through the maternal medicine networks (or regional lead clinicians)[2,3,7].
4. Local policies should be developed for the care of critically ill maternity patients.
5. Consultants in intensive care should have an active role in multidisciplinary discussions and meetings concerning the pre-conception, antenatal, peripartum and post-partum care of patients with significant pathology, especially those likely to require ICU admission[2].
6. The transfer of critically ill maternity patients should follow the specific guidance for this patient group[8].
7. There should be clearly defined pathways for AHPs in intensive care, and intensive care pharmacists to access experienced support from regional/supra-regional colleagues experienced in maternity care[2].
8. Intensive care and outreach from intensive care services should contribute to maternal critical care and enhanced maternal care training for doctors, nurses, midwives, and the broader multidisciplinary team[3].
9. Local training should be regularly reviewed to ensure that competencies and exposure to the management of maternal critical care align with up-to-date clinical guidance and practice[1,9].

10. When inclusion criteria are met, ICUs should actively promote the inclusion of maternity patients in clinical research trials and studies[1,2].
11. Data relating to enhanced maternal care and maternal critical care should be routinely collected and reviewed to enable benchmarking and improve outcomes, with insights disseminated to the wider multidisciplinary team[6].

BACKGROUND AND EXPLANATION

Despite the UK's low maternal mortality, recent trends show a rise that may be linked to factors such as increased maternal age, diabetes, obesity, and hypertension. Significant disparities in outcomes persist across different ethnic and socioeconomic groups[1,2,3]. Delivering care to critically ill maternity patients presents additional challenges given variations in team skill-mix, resource constraints, and the distances between maternity units and intensive care facilities[4,10]. Nevertheless, these logistical challenges need to be seen as obstacles to overcome rather than justifications for inequitable care.

Clear escalation routes to both enhanced maternal care and intensive care are paramount along with the early recognition of maternal deterioration. The adoption of nationally agreed maternity-specific early warning scores, already in use in Scotland and being introduced in England, is vital wherever care in received[6,11]. When needed, intensive care input cannot be delayed. If immediate transfer to an ICU is not possible, staff with the necessary expertise need to provide the required level of care at the patient's current location until transfer is possible[2,6,12].

ICUs admitting critically ill maternity patients need to be prepared for severe maternal morbidity and potential adverse events with relevant protocols, equipment, drugs, and trained staff promptly accessible. In maternal cardiac arrest, there needs to be immediate access to resuscitative hysterotomy and neonatal resuscitation. Checklists help ensure emergency equipment is available and that the wider multidisciplinary team is promptly informed of a maternity patient's admission. The neonatal team need to be informed of all patients who have reached a viable gestation, with the patient's exact location clearly specified, and local arrangements for emergency neonatal equipment followed. Where maternity or neonatal services are not co-located with the ICU, local plans need to ensure safe care despite these barriers. There are specific processes to follow after a maternal death, including timely notification of relevant agencies, determining whether referral for post-mortem is required, and providing appropriate support for families and staff, working closely with local maternity services.[13]

Local policies for the care of critically unwell maternity patients would ideally cover topics such as: maternity-specific reference ranges for physiological parameters (aligned with the Maternity Early Warning Score), maternity-specific admission checklists, the promotion of family-centred care, follow-up that includes a review of psychological well-being, and signposting to pre-conception counselling for all patients of childbearing capacity recovering from any critical illness.[2,3,7] Ongoing collaboration between maternity and intensive care teams is essential to maintain up-to-date knowledge and skills, with mutual support through teaching and shared learning to build confidence in caring for critically ill maternity patients.

Critically ill maternity patients require regular multidisciplinary review. The team attending the patient must include an intensive care consultant and an obstetric consultant and will ideally also include an obstetric anaesthetic consultant, a senior midwife, and the neonatal team when their expertise is required for the planning and delivery of care. Daily anaesthetic review would normally occur from 20 weeks' gestation to 7 days postpartum, and beyond this period if clinically indicated. A named obstetric consultant is invaluable for the duration of the intensive care admission to provide continuity, ensure oversight, and coordinate maternity-related aspects of care when multiple teams are involved. In gestations under 20 weeks, obstetric review may be substituted by gynaecology review depending on local arrangements. Input from an obstetric physician can be sought where available, and from the relevant organ specialists where appropriate. Allied health professionals play an important role in maternal critical care. Clinical psychologists also have a key role. Where maternity-specific expertise is lacking, local multidisciplinary teams need to have clear pathways to seek advice from regional or supra-regional colleagues with experience in maternity care.

When care needs cannot be met locally, transfer should be arranged and conducted according to the latest guidance, which includes specific advice for critically ill maternity patients.[8] In particular, patients with refractory hypoxaemia need to be promptly referred for consideration of ECMO, with indications for ECMO in pregnancy being the same as for general adult patients and outcomes being comparable or superior.[2]

When clinical condition permits, the patient needs to be supported in providing routine newborn care in the ICU, encouraging partner and family involvement. Breastfeeding support must be available, and any unavoidable separation from the newborn needs to be minimised, with facilitated visits to the NICU or vice versa. Skin-to-skin contact may be beneficial even when the mother is receiving advanced respiratory support, and virtual contact using videoconferencing software may be offered where reuniting mother and baby is not possible.[14]

Follow-up care for maternity patients' needs to include screening for psychological harm such as PTSD and arranging specialist help as needed. There is an increased risk of mortality and hospital readmission within one year among maternity patients who have been admitted to intensive care.[13] Patients' of childbearing capacity recovering from any critical illness need to have the opportunity to discuss the impact of pregnancy on their health and be referred to specialists in maternal medicine for advice on future pregnancy, long-term health and contraception.[7] In addition, adverse maternal or neonatal outcomes can have a profound impact on staff, and it is important to have processes in place to identify those affected and provide timely support, including psychological care where needed.[13]

Improving the quality of care for critically ill maternity patients requires strong leadership in ICUs and ACC networks (or equivalent). Aligning with experts in maternal medicine at a regional level, such as through the maternal medicine networks in England, supports effective management of high-risk patients, whether their deterioration is anticipated or unexpected. Systematic data collection is essential for benchmarking and enhancing the quality of care for this patient group. Through joined-up care, good communication, and effective multidisciplinary working, we can make a significant difference to outcomes while ensuring that the voices of maternity patients who acquire severe morbidity are heard.

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3.19 Care of the Critically Ill Child in an Adult Intensive Care Unit

Authors: Peter Donnelly, Gerard Manning & Donna Webb

INTRODUCTION

In line with Paediatric Critical Care Society, we refer to Paediatric Critical Care for children.

Children under the age of 16 requiring intensive care support will be looked after in a Paediatric Critical Care Unit (PCCU) or neonatal ICU for newborns. It is not unusual however, for children to require input from adult teams to provide initial support, resuscitation and stabilisation depending on the resources available within each hospital. Additionally, in 'surge' conditions, an adult ICU may be asked to provide a longer period of care for older paediatric patients due to local bed pressures and/or availability of paediatric critical care transport teams. Within specialist hospitals, consideration needs to be given to the appropriateness of patients cared for within an adult setting in respect of their age and pathology.

Children aged 16-18 years of age are a group who often fall between paediatric and adult services. Local agreement and processes are needed to ensure appropriate care. The importance of a well-led and planned transition from paediatric critical care to adult intensive care services for children approaching adulthood with complex and potentially life limiting diseases, is increasingly recognised.

The 6th edition of the Paediatric Critical Care Society (PCCS) Quality Standards (2021) outlines the expected standards which apply to services providing paediatric critical care support in an adult ICU. This chapter highlights the key standards required to provide safe and high-quality care for this patient group.

MINIMUM STANDARDS

1. Critically ill children under 16 years old must only be admitted to and stay on an adult ICU if a PCCU bed is not immediately available.
2. Admission must be discussed and agreed by the local adult intensive care consultant, the admitting local consultant (e.g. paediatrician or paediatric surgeon) and the PCCU consultant (this may be the regional paediatric transport team consultant) at the time of admission and daily thereafter.
3. A local consultant paediatrician or PCCU consultant and a paediatric nurse must be available for advice 24/7.
4. A nominated lead intensive care consultant and lead nurse in the adult ICU must be responsible for intensive care policies, procedures and training related to the care of children, including transition.
5. Protocols for resuscitation, stabilisation, accessing advice, maintenance and transfer of critically ill children and the provision of paediatric critical care must be available.
6. An adult ICU that may provide care for critically ill children must have drugs and equipment appropriate to the age of the children who may be admitted available and checked in line with local policy.
7. Escalation, end of life and organ donation decisions must be discussed in collaboration with the regional PCCU consultant (this may be the regional paediatric transport team consultant), under a shared care model.
8. There must be collaborative working between the adult ICU and the regional PCCU to ensure that staff are supported to work outside their normal core competencies.
9. There must be 24-hour access for parents/carers to visit their child.

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

1. The child should be reviewed by a local consultant paediatrician and paediatric nurse twice a day during their stay on the adult ICU.
2. An onsite anaesthetist, intensivist, paediatrician or other healthcare professional with competence in paediatric resuscitation and life support and airway management should be immediately available 24/7.
3. A consultant anaesthetist, intensivist or paediatrician competent in advanced paediatric resuscitation and life support and airway management, should be available 24/7 and able to attend the hospital within 30 minutes.
4. There should be access to specialist paediatric healthcare professionals, allied health professionals and pharmacy advice 24/7.
5. All adult ICUs should actively engage with transition from paediatric to adult intensive care services for children approaching adulthood with complex and potentially life limiting diseases.

6. Local agreement and processes for the care of 16-18 year olds should be agreed between paediatric and adult intensive care services.

BACKGROUND AND EXPLANATION

The landscape of paediatric critical care has changed over the last few decades and now consists mainly of centralised PCCUs and regional transport services. Approximately 18,300 children are admitted to paediatric critical care every year and the demand for beds is increasing by approximately 5% year on year due to a number of factors such as advances in medical technology, improvements in neonatal care, and increasing education and knowledge[1,2]. A recent NHS England review recommended the creation of paediatric critical care clinical networks across England with the hope of reducing demand on Level 3 beds by delivering Level 1 and 2 care outside of a PCCU[1]. Despite the increase in demand, there has been no year-on-year increase in capacity within the paediatric critical care national footprint with reports finding that there are too few Level 2 beds across England to reduce demand on Level 3 beds and deliver care closer to the family home.[1] As a result of this centralisation of services, and other factors such as workforce planning/succession, it is recognised that some clinicians may feel inadequately trained to care for paediatric patients in certain settings.[3]

In order to assist the adult intensive care teams who find themselves in this position, the PCCS guidelines 2021 set out clear guidelines for the care of children within the general intensive care environment with a series of quality standards describing recommendations in areas such as nursing and medical training and staffing, environment and family support[4]. The PCCS standards recommend that advice from the PCCU within existing referral pathways must be available where children are not under the care of a paediatrician, and that adult ICUs have appropriate guidelines in place.

Critically ill children under 16 years old must only be admitted to and stay on an adult ICU if a PCCU bed is not immediately available. Exceptions to this, for reasons of bed capacity, patient physiology or social circumstances need to be agreed and clearly documented by both the adult ICU and PCCU consultant or regional paediatric critical care transport consultant, at the time of admission. Children over the age of 16 may occasionally be admitted to PCCU on a case-by-case basis; for example, a 17-year-old with a complex background who has not yet transitioned to adult services.

Every year there are seasonal winter pressures in paediatric critical care where capacity is more likely to be stretched. Teams are required to make decisions to ensure an appropriate critical care bed is found for each individual patient and in some circumstances this might require utilisation of a neonatal or adult intensive care bed. The PCCS has written guidance on such circumstances to provide colleagues with a framework to support the decision-making processes[5].

The COVID-19 pandemic has shown that both adult and paediatric staff have transferrable skills and are able to support each other with mutual aid. Accepting the potential for further surges in paediatric critical care demand, we need to ensure that appropriate surge education and training is available to all staff within the adult intensive care community. Escalation pathways and creation of local surge protocols can ensure that continuous robust structured support and advice is available to provide safe, high-quality care for paediatric patients.

Guidance to support the transition from paediatric to adult intensive care services for patients with complex and potentially life limiting diseases, was published by the ICS and PCCS in 2022[6]. It is recognised that a 'one size fits all' approach cannot be used for intensive care transition and that certain aspects will be tailored to the specific working requirements of the hospitals and networks involved. A multidisciplinary approach is emphasised.

Local agreement and processes for the care of 16-18 year olds should be agreed between paediatric and adult intensive care services. This will reduce the risk of these children falling between paediatric and adult services to the detriment of their care.

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3.20 Rehabilitation

Authors: Zudin Puthucheary, James Bruce, Sarah Vollam & David McWilliams

INTRODUCTION

Mortality from critical illness continues to decrease, with a hospital mortality in 2019 of 18.5%[1]. Survivorship following admission to ICU is increasingly considered to be a defining issue for modern critical care[2]. Survivors have substantial functional limitations that persist in 70% at 6-12 months, functional capacity can be impaired for more than five years and 30% remain carer-dependent[3-5].

Rehabilitation is recognised as a key part of recovery from critical illness, managing the impact of impairments or disabilities to restore function and improve independence[6]. Rehabilitation needs to be patient-centred, supporting patients to achieve their individualised goals, by maximising recovery of physical, cognitive, and psychosocial functions to improve quality of life[7].

This chapter should be read in conjunction with Chapter 3.21 Outpatient Follow-Up.

MINIMUM STANDARDS

1. A comprehensive assessment of rehabilitation needs, using a standardised assessment proforma/tool, must be carried out within four days of admission to intensive care and updated at ICU discharge, using a validated screening tool[8].
2. Those patients identified to have rehabilitation needs must have a clearly documented, personalised, multidisciplinary rehabilitation plan which is updated weekly and handed over to the receiving team at ICU discharge.
3. Rehabilitation goal setting must occur at least weekly for all patients engaged in rehabilitation, with input from all members of the multidisciplinary team, and include the patient where possible.
4. A comprehensive reassessment must take place two to three months after discharge either in person or remotely using a validated screening tool.
5. Delivery of the multidisciplinary rehabilitation plan must be audited in line with departmental clinical governance frameworks.
6. All intensive care staff with patient facing roles must have pain, agitation, delirium, immobilisation, and sleep (PADIS) education as part of their ICU induction[9].
7. There must be a documented structured assessment of PADIS on the daily medical review to improve recognition, standardisation of treatment and improve patient outcomes post ICU delirium[9].
8. Written information at the time of discharge from hospital, including ongoing rehabilitation plans and discharge information, must be communicated to the patient, their general practitioner and other secondary care professionals offering ongoing care.

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

1. A standardised assessment proforma/tool of rehabilitation needs should be used to ensure that all required specialties are included[9].
2. Assessments post hospital discharge should consider and measure patient recovery or persistent deficits that were identified at ICU and hospital discharge.
3. A member of the ICU multidisciplinary team should be named on the rehabilitation plan as contact for staff and patients to provide ongoing advice and support throughout the recovery pathway, up to the time of follow-up assessment.
4. There should be a dedicated clinical lead for intensive care rehabilitation.
5. Post-ICU discharge, patients should be followed up on the ward by a designated member of the ICU multidisciplinary team to support their rehabilitation plan.
6. There should be a holistic assessment of a patient's current limitations and include encouragement to participate in identified activities which are purposeful to the patient with a view to regaining independence of function.

BACKGROUND AND EXPLANATION

Many who leave ICU alive suffer from post intensive care syndrome[10,11] to which many factors contribute such as rapid acute muscle wasting and associated disability[12]; cognitive problems relating to impaired short-term memory

and executive function; depression, anxiety and post-traumatic stress-disorder[13]; and dysphonia and dysphagia in those with and without tracheostomies[14]. Impacts are compounded by increased sedentary behaviour, and from psychosocial problems that arise from increased dependency, unemployment and economic deprivation[5,15].

Recovery from critical illness commences in ICU, with the ICU multidisciplinary team who expertly assess and plan the recovery during the patients' illness in collaboration with ward-based multidisciplinary teams on step down. Assessments need to be made using validated screening tools that aim to identify issues that will impact progress during recovery and influence the development of a bespoke rehabilitation plan. One such tool is the Post-ICU Presentation Screen (PICUPS), and other tools may be developed over time[7,16]. Delivery of the multidisciplinary rehabilitation plan must be audited and include provision of rehabilitation services from a range of professions including physiotherapists, occupational therapists, speech and language therapists, dietitians, rehabilitation coordinators, practitioner psychologists and consultants with an interest in rehabilitation. Rehabilitation requires a personalised approach, including orientation boards, patient diaries and engagement with family members to maximise humanisation. A dedicated MDT ICU recovery clinic, offering continuity of care and monitoring, is recommended. Integration with community services and primary care is vital to ensure sustained recovery and reintegration into daily life[8].

Additional standards and recommendations to this chapter build on and recognise the wealth of research, national awareness and patient voices in the need for detailed rehabilitation standards. Patients have increasingly vocalised the gaps in service provision and communication along their recovery journey. Responsibility for such service delivery sits not with individual enthusiasts, but with clinical services, and therefore falls under individual services clinical governance umbrella.

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3.21 Outpatient Follow-Up

Authors: Joel Meyer MBE, Sandra Taylor & Andrew Slack

INTRODUCTION

Critical illness can lead to long-term physical, cognitive and psychosocial problems for both patients and caregiver(s) after returning home, termed post intensive care syndrome (PICS). Patient-specified goal-directed rehabilitation begins in ICU and continue through to ward discharge and the return home. Rehabilitation is led initially by inpatient allied health professionals and then after returning home by the GP, community services, and where available post-ICU recovery services; these are most frequently an outpatient clinic model with health professional consultation virtually or in person. Key outcomes need to be focused on a return to pre-ICU functional status addressing physical and mental morbidity with social and financial support, when needed.

This chapter should be read in conjunction with Chapter 3.20 Rehabilitation.

MINIMUM STANDARDS

1. All patients at risk of PICS, must be assessed for PICS following ICU stepdown.
2. Information about the post ICU outpatient services and support available must be communicated to patients, their family and friends, and/or their caregiver(s).
3. All ICUs must provide a case mix-appropriate post-ICU recovery outpatient clinic delivered by dedicated staff.
4. Post-ICU recovery outpatient clinic services must assess and manage both physical and non-physical (cognitive and psychosocial) domains.
5. Every post-ICU recovery outpatient clinic consultation must provide a letter to the patient or their caregiver and the patient's GP which summarises the consultation and, where appropriate, the ICU stay.
6. All post-ICU recovery outpatient clinic services must produce a standard operating procedure (SOP) and scheduled reports of activity/performance, including the proportion of eligible patients seen.

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

1. All ICUs should have a multiprofessional post-ICU recovery outpatient clinic team.
2. All post-ICU recovery outpatient clinic teams should provide digital or paper format information about common post-ICU problems signposting to advice, guidance and support that incorporates social and financial wellbeing resources.
3. All post-ICU recovery outpatient teams should have access to ICU diaries and an ICU patient and relatives peer support group.
4. All post-ICU recovery outpatient teams should complete a systematic enquiry into common post-ICU problems and gather patient-reported outcome measures, within three months of hospital discharge, where possible.
5. Post-ICU consultation clinic letters should include details of post ICU issues identified, individualised recovery goals, and recommended actions.
6. All post-ICU recovery outpatient teams should incorporate patient and caregiver feedback about their ICU experience and the outpatient clinic to co-design and improve these services.

BACKGROUND AND EXPLANATION

In the UK, during 2021, ICNARC Case Mix Programme data reported 140,115 patient admissions to ICU, with 114,449 (81.7%) surviving ICU and 105,614 (75.8%) surviving the acute hospital admission[1,2]. 80% were independent prior to admission. After returning home, quality of life can be impacted by:

- PICS prevalence up to 80% with around 50% having persistent symptoms beyond the first year home[3].
- Anxiety (62%), depression (36%), and posttraumatic stress disorder (PTSD) (39%)[4].
- Unplanned readmission to hospital within three months of returning home (25-30%).
- An inability to return to work (40%), job loss (20-36%), occupation change (7-66%) and worsening employment status (5-84%).
- An inability to resume driving (30%).
- Commonly under recognised issues include sleep disorders, sexual dysfunction, cognitive impairment, nutritional status and pain.

- Caregiver/family PICS (PICS-F) has a highly variable prevalence, ranging from 6% to 69% in the first six months with some affected for years[5].

ICU clinicians across the globe with well-established post-ICU recovery services have undertaken research and demonstrated the need for holistic outpatient care led by intensivists and multidisciplinary teams. The Faculty of Intensive Care Medicine, agreed to lead a working party, on *Life After Critical Illness* (recommendation 12 of its Critical Futures programme). The working party published Life after critical illness: A guide for developing and delivering aftercare services critically ill patients in October 2021[6].

This document provides best practice guidance in the development, commissioning and management of 'Follow up' services, including learning from existing examples of practice:

- Terminology/definitions
- Breadth and scope of current UK practice
- Service model archetypes and eligibility criteria
- Toolkits and resources for implementation of a new service
- Running a service
- Business case development
- Service specifications
- Governance
- Referral process, efficiency, DNA
- Measures, outcomes, benchmarking
- Extending services – primary care, community, adolescent, regional network.

A dedicated MDT ICU recovery clinic, offering continuity of care and monitoring, is recommended. Integration with community services and primary care is vital to ensure sustained recovery and reintegration into daily life[7].

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3.22 Care at the End of Life

Authors: Sally Humphreys, Eloise Dawe & Joseph Cosgrove

INTRODUCTION

Intensive care focuses primarily on life sustaining therapies but with in-hospital mortality at 17-20% the provision of good end-of-life care (EoLC) is vital[1,2]. Additionally, treatments initiated to save life can be invasive, distressing and potentially conflicting with effective palliative and end-of-life care[3]. Clinical teams have to therefore recognise that some treatments may not be to the patient's overall benefit and be able to clearly and compassionately communicate this[4]. They have to ensure decisions are taken in accordance with relevant statutory requirements and professional guidance[5-11].

'Family' is not a singular unit; it is composed of various individuals with varying importance to the patient. For that reason, we use 'family and friends' or 'family/friends' in this chapter.

MINIMUM STANDARDS

1. ICUs must have an identified clinical lead for EoLC.
2. There must be clear and comprehensive documentation of a shared decision-making process for all end-of-life patients in the medical record[4,12].
3. Clear access pathways must be in place for appropriate patients who wish to transfer to another EoLC setting such as a hospice or home[13,14].
4. Multidisciplinary teams must manage EoLC patients[11] including senior intensive care medical and nursing staff, referring teams and specialty palliative care teams.
5. ICUs must have a standardised process to regularly assess and document symptom control (including pain and anxiety/agitation/delirium at a minimum) in patients at the end-of-life[10,11].
6. Anticipatory medication must be prescribed using an individualised approach considering the patient's needs, views, values, and preferences[10].
7. ICUs must use recognised validated tools that encompass spiritual, emotional, practical, physical, and psychological needs and pain scores (e.g. RESPECT[15]).
8. The diagnosis and confirmation of death must follow the circulatory or neurological criteria set out by the Academy of Medical Royal Colleges in 'A Code of Practice for the Diagnosis and Confirmation of Death'[16].
9. Access to bereavement support and follow up must be available for patients, families/friends and staff who have experienced end-of-life decision making[4].

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

1. ICUs should have guidance in place that provides patients the opportunity to have individualised EoLC specific to their wishes e.g. access to pets, outdoor space[17,18], and a personalised environment.
2. Close family and friends should be able to remain with a patient receiving end-of-life care throughout the day and night.
3. ICUs should provide space for close family and friends who wish to stay overnight with a dying patient, within or close to the ICU[19,20].
4. Intensive care morbidity and mortality meetings should regularly include a review of the effectiveness of any symptom management protocols and the overcall care provided for patients (and their families/friends) who received care at the end-of-life[19].

BACKGROUND AND EXPLANATION

Transitioning to EoLC prioritises symptom management, psychological support (for patients and their families/friends), and alignment of treatments with individual care goals, values and preferences. The purpose of this chapter is to ensure that ICUs have appropriate structures and processes in place to allow individualised care plans to be implemented which meet current legal and quality standards for intensive care patients in the last hours/days of their life.

Skills in quality EoLC are dependent on symptom management, good leadership, planning, decision making, communication and multidisciplinary working. The majority of deaths on the ICU follow withdrawals or limitations of treatments when failure of curative treatments become apparent[3,4,20]. These decisions need to be individualised and

include a shared approach to decision making[9]. The GMC has published extensive guidance to aid decision making in this area. It covers best practice for adults with and without capacity and considers relevant law[8].

There is an increasing awareness of the long-term impact that involvement in EoLC has on the psychological wellbeing of family members/friends and others involved in such care[21]. This chapter therefore reflects an increased focus on psychological support, wellbeing and bereavement. It also introduces the importance of reflective learning from all deaths and increases the number of standards on individualised care and collaborative working.

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3.23 Organ and Tissue Donation

Authors: Tom Billyard, Alison Ingham & Helen Tyler

INTRODUCTION

Consideration of organ and tissue donation is a key component of good end-of-life care (EoLC)[1]. Facilitating donation is a core service of every ICU, and all acute hospitals have a role in implementing best practice in all stages of the donation pathway. There are well-defined UK professional, legal and ethical frameworks setting out best practice, developed with, and endorsed by, national professional bodies[2,3].

MINIMUM STANDARDS

1. Intensive care staff must consider organ and tissue donation for all patients reaching end of life in the ICU, as part of a holistic care plan[1,4].
2. Each acute health board/trust must have a clinical lead for organ donation (CLOD) who works with a specialist nurse for organ donation (SNOD) to ensure best practice in donation is delivered and local policies are up to date.
3. The diagnosis and confirmation of death must follow the circulatory or neurological criteria set out by the Academy of Medical Royal Colleges in A Code of Practice for the Diagnosis and Confirmation of Death[5].
4. ICUs must contribute data to the NHS Blood and Transplant (NHSBT) national potential donor audit.
5. ICUs must use national guidance to optimise donor care after consent/authorisation to increase organ utilisation and optimise transplant outcomes.

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

1. The intensive care team should be represented on the health board/trust's Organ Donation Committee, which provides oversight of all aspects of deceased organ and tissue donation[6,7].
2. The CLOD and SNOD should regularly review and share within the ICU local performance data from the NHSBT national potential donor audit, to ensure that timely identification and notification of potential donors to organ donation services is occurring.
3. The CLOD and SNOD should regularly review and share within the ICU local performance data from the NHSBT national potential donor audit, to ensure that any approach to the family for organ donation is a collaborative approach by the intensive care team and the SNOD.
4. The Donation Actions Framework provides detailed guidance on the professional, legal and ethical considerations for donation in England, Wales and Northern Ireland and should be used to support decision-making and guide practice, with recognition of the applicable legislation[2].
5. All intensive care staff likely to be involved in the care of potential organ or tissue donors should receive training in the principles of donation so that patients and their families can receive the care and support they need during the donation process[8,9].

BACKGROUND AND EXPLANATION

The potential for organ transplant has increased year on year as surgical techniques and transplant after-care has improved. The need for an increase in organ donors was recognised by the Organ Donation Taskforce Report in 2008 and has been delivered by subsequent UK strategies documents and extensive NHSBT service development[6]. Robust professional guidance exists to ensure safe and supported practice and is essential as the field advances and new technologies emerge.

The duty of care to the patient remains the priority at all times and care planning has to hold this at its core[1,10,11]. The decision-making regarding withdrawal of life sustaining treatments and the move to EoLC must be made in line with professional and legal guidance and be independent of any potential for organ donation. However, the expressed decisions and values of the patient will direct how EoLC is delivered and inform any assessment for donation. The diagnosis of death by circulatory or neurological criteria must conform to current practice standards, irrespective of potential organ donation.[5]

The public perception of donation and societal engagement with the subject has shifted considerably. The strong public and political support on the adoption of an opt-out system across the UK nations demonstrates this. Exploring a patient's decision regarding donation is now an expected part of practice, detailed in clinical and legislative

guidance[1,3,4]. Every ICU needs to be able to deliver holistic, person centred EoLC that supports potential organ and tissue donation. There are now well-embedded UK processes for identification and referral of potential donors and gaining consent/ authorisation for donation. Alongside these the ethical, legal and professional framework which underlies donation has been developed to ensure safe and reliable donation processes.[2] There are differences in the legislation of the devolved nations in respect to organ and tissue donation; most significantly in Scotland where a number of additional safeguards were included within the deemed authorisation legislation.[3] The SNOD expertise and training in delivery of these processes is essential and is maximised by early collaborative working.

The CLOD and the local organ donation committee need to ensure systems exist within every health board/trust to facilitate high quality donation practice in a consistent manner.[6] The role of intensive care staff includes active donor management to increase organ utilisation and optimise transplant outcomes.[2,13] The SNOD will support ICU staff (doctors, nurses and allied health professionals) in the use of nationally endorsed care bundles following neurological death, delivery of appropriate patient management within professional guidance, and potential adjustments to place or process at end of life.[8] The positive changes in UK donation practice have resulted in a doubling of the number of donors since 2008. However, despite these improvements the consent / authorisation rate for donation remains low compared to other comparable countries with deceased donation programmes. This is a significant barrier to the UK achieving a world-class donation and transplant service. ICU staff can help improve consent / authorisation rates through their communication with patients and families; allowing families time to understand and accept end-of-life or death, pro-actively planning end-of-life donation conversations with the SNOD and undertaking a collaborative approach for donation at an appropriate time.[8,9]

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Section 4

Service Development

4.1 Research

Authors: Bronwen Connolly, Ben Creagh-Brown & Charlotte Summers

INTRODUCTION

Observational data clearly demonstrate the high costs (at personal, service, and societal level) associated with critical illness during the acute hospital stay, but also over time horizons extending many years after acute hospital discharge. The National Institute for Health and Care Excellence (NICE) recommends implementing and funding new treatments and interventions based on clinical and cost-effectiveness from an NHS perspective. Alongside the NHS's commitment to delivering continual clinical improvements, participation in research is a core component of delivering high-quality intensive care. This is also now highlighted by the General Medical Council in the Duties of a Doctor (2024)[1].

MINIMUM STANDARDS

1. All individuals participating in research activity must have completed Good Clinical Practice (GCP) training for research and keep this up to date.

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

1. All ICUs should participate in research.
2. ICUs should have a nominated research lead (usually, but not necessarily, a medical consultant) who coordinates activity and is the principal liaison with trust/health board research and development (R&D) departments and the National Institute of Health and Care Research (NIHR) Regional Research Delivery Network (RRDN) Critical Care Lead, or equivalent in the devolved nations.
3. The nominated research lead should have dedicated and funded time within their job plan or equivalent to perform this role.
4. ICUs should participate in research networks, which are organised through the NIHR RRDN or equivalent in the devolved nations[2].
5. All research studies should be registered on the NIHR Critical Care Research Portfolio (overseen by the Critical Care National Specialty Group[3]) whenever they fulfil eligibility criteria.
6. ICUs participating in research should provide information to patients, relatives, and surrogate decision makers (SDMs) about ongoing research, for example through posters, leaflets, or within generic intensive care information resources.
7. ICUs participating in research should have clear procedures for approaching patients, families, and SDMs in a manner that minimises stress and/or burden, but that also provides adequate information in a timely manner.
8. ICUs delivering multiple studies should implement processes to support co-enrolment including patient tracking, and clear communication between individuals taking consent[4].

BACKGROUND AND EXPLANATION

Research is the mechanism by which new knowledge is acquired to develop diagnostics, treatments, therapies, and services, and to provide evidence that these are both clinically and cost effective. High-quality evidence is needed to justify widespread adoption, and to ensure all NHS patients can benefit from new therapies. The NHS is committed to supporting research activity. All patients have the right to participate in this activity, including when they are critically ill. Offering the opportunity to participate in clinical research is integral to the duties of a medical doctor[1].

The NIHR is the national organisation that oversees research funding, governance, and delivery in the NHS. In the UK, ethical research approvals are managed through the NHS Health Research Authority's national gateway (Integrated Research Application System: IRAS (https://www.myresearchproject.org.uk/) following recommended guidelines[5].

National Institute for Health and Care Research

The NIHR research delivery infrastructure includes research delivery networks (RDN), of which England is divided into 12 regional RDN (RRDN) each with distinct geographical boundaries and a lead organisation[2]. Each RRDN receives government funding to support research delivery within its hospitals and healthcare organisations, for example, through staffing provision such as research nurses and pharmacy, or protected research time within job plans. Similar networks are present in Scotland, Wales and Northern Ireland, and all four nations are participants in the NIHR National Specialty Group for Critical Care.

For the intensive care specialty, each RRDN has a research lead whose remit is to promote and coordinate regional activity. Devolved nations have different structures and funding organisation in place. RRDN and intensive care leads meet with the National Specialty Lead for Critical Care regularly, as members of the National Specialty Group (NSG), to coordinate and develop intensive care clinical research activity and manage the UK Critical Care Research Portfolio. The Critical Care NSG contributes to developing, promoting, and delivering patient pathway research in partnership with other cogent hospital and community-specialty groups.

Critical Care Research Portfolio

Research funded competitively by 'eligible' funding organisations, 'adopted' commercial research, and other 'adopted' research (for example international trials) comprise the UK critical care research portfolio. Eligibility criteria and adoption processes are available via the NIHR website[6]. Intensive care studies are regularly reviewed by the RRDN teams to ensure appropriate support is provided and the study is successfully delivered. Studies on the NIHR research portfolio are eligible for support (for example, by research nurses) through RRDNs and are the priority for the NIHR.

Funding research activity

Funding for research studies in the NHS is divided into NHS support costs, direct research costs, and excess treatment costs[7]. A description of these as they relate to ICUs, and where funding can be sought, has been published[8]. Support for screening and consent processes (for example, research nurse time), which is labour-intensive and time-critical for many intensive care studies, is an NHS support cost and needs to be sought through RRDNs or local R&D departments. Continual improvements for supporting and embedding research into clinical practice and engaging health and social care clinicians, patients, and other stakeholders are central to the NIHR ethos, enabling research delivery[9,10].

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4.2 Audit and Quality Improvement

Authors: Kevin D Rooney & Irfan Chaudry

INTRODUCTION

Quality healthcare is defined by the Institute of Medicine as care that is 'safe, effective, efficient, equitable, timely and patient centred'[1]. Clinical audit is a means to find out if the healthcare provided is in line with agreed and proven standards, helping professionals and patients identify how their service is performing, and where improvement could be made[2]. Quality improvement (QI) completes the audit cycle and has been described as the 'combined and unceasing efforts of everyone – to make changes that will lead to better patient outcome (health), better system performance (care) and better professional development (learning)'[2].

MINIMUM STANDARDS

1. ICUs must have a structured and planned clinical audit programme to compare practice to published standards.
2. ICUs must participate in a national patient outcome benchmarking audit.
3. There must be an identified lead(s) for the audit programme, with appropriate resources and time allocation for the role.
4. ICUs must have a QI programme to support the processes of care[3,4].
5. ICUs must be able to clearly evidence change as a result of audit, QI and measured patient outcomes.

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

1. Multidisciplinary staff should be encouraged and supported to train in QI methodology.
2. QI projects should be multidisciplinary where possible.
3. ICUs should have robust data-collection systems in place that support the collection of activity and quality data for local and national audit, and QI programmes.

BACKGROUND AND EXPLANATION

Recognised national audits, together with the collection of nationally mandated datasets such as the ICNARC Case Mix Programme[5] and the Scottish Intensive care Society Audit Group (SICSAG) provide information for both quality assurance and QI. Measurement is an integral part of both clinical audit and QI. As such, it is important that ICUs monitor key measures of:

- Structure (e.g. nurse staffing and skill levels in intensive care)
- Process (e.g. night-time discharges from intensive care)
- Outcome (e.g. risk adjusted mortality).

When undertaking both audit and QI, the focus of the project are best served by looking at structure, process and outcome measures in one of the domains of healthcare recommended by the Institute of Medicine or other UK regulatory bodies; namely safe, effective, efficient, equitable, timely or person-centred care[1].

To best support audit and QI, ICUs will benefit from having robust data-collection systems. These systems need to be easy to use, secure and resilient. It is important that resources (financial and time allocation) are identified to employ staff to facilitate data collection and input.

QI can be supported by regular measurement, e.g. monthly review of patients readmitted after discharge from ICU. Charts can be simple 'run charts', and the construction and display of such charts can form an integral part of a QI process. Results can be shared with staff, patients, and carers.

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4.3 Clinical Governance

Authors: David Sperry & Suman Shrestha

INTRODUCTION

Clinical governance is the system through which NHS organisations are accountable for continuously improving the quality of their services and safeguarding high standards of care by creating an environment in which clinical excellence will flourish[1].

Clinical effectiveness is the application of the best knowledge, derived from research, clinical experience and patient preferences to achieve optimum processes and outcomes of care for patients. The process involves a framework of informing, changing, and monitoring practice[2].

Clinical governance ensures that care is safe, effective, person-centred and assured[3]. Demonstration of safe care includes reporting and investigation of incidents, regular review of morbidity and mortality (including structured case review of deaths[4]) and maintenance of risk registers. Effective care encompasses the availability and use of guidelines, standards and quality service improvement. Person-centring covers patient and family involvement in services including service planning, incident and complaint investigation. Assurance comes through external health care inspection (e.g., CQC) and may be evidenced by membership of national audit groups (ICNARC, SICSAG) for quality benchmarking.

MINIMUM STANDARDS

1. There must be an appropriately trained intensive care consultant and senior nurse identified as leads for clinical governance.
2. Clinical governance processes must be fair, transparent and free from bias and discrimination as well as being supportive of staff, patients and their families.
3. There must be regular multidisciplinary governance meetings where progress and completion of incidents, risks, complaints, regular audits and learning from governance is discussed.
4. All intensive care services must maintain and regularly review a risk register.
5. There must be a robust system for reporting, investigating and learning from all patient safety incidents which includes a clear pathway to the hospital board level.
6. ICUs must hold regular structured and minuted, multidisciplinary morbidity and mortality meetings in which clinical staff will discuss learning from deaths, incidents, good practice and risks.
7. Key performance indicators (KPIs) must be identified, both locally and according to national benchmarking audits.
8. Local and relevant national guidelines must be readily available to clinicians.
9. All staff must receive training (ideally at induction) on access to relevant patient care information.
10. Regular quality of care feedback must be obtained using (i.e. using safety surveys[4] and relatives' questionnaires[5]) and the results shared.

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

1. There should be a robust system for identification of cases requiring structured mortality review, which includes significant incidents, concerns on the part of patients, families, clinicians, medical examiners or coroners/ procurator fiscals and written complaints.
2. Staff undertaking structured mortality review should be adequately trained, of sufficient seniority and have appropriate time to complete the process.
3. A programme of quality service improvement should be in place with close links to governance as a source of targeted improvement.

BACKGROUND AND EXPLANATION

It is important for leadership teams to create a culture where intensive care staff are comfortable reporting incidents, feel listened to when issues arise and are open and honest with patients when things go wrong. Staff need to feel supported through governance processes and specific support is needed for staff involved in safety incidents or patient mortality. Governance staff conducting incident investigation and duty of candour processes need to be trained to deliver sensitive and constructive reviews and medical staff aware of GMC guidance around engagement with the governance processes and CQC reviews.

The consultant identified as lead for governance cannot be the clinical lead or director for intensive care and they along with the nursing lead, require adequate time for this role included in their job plans. It would be beneficial for intensive care governance staff to work with other clinical teams in the trust/health board and region to share learning from incidents and mortality review, disseminate best practice and enhance quality improvement. Training in clinical governance and structured mortality review needs to be provided for intensivists in training.

It is important that patients and families are encouraged to raise issues, complaints or compliments, and are supported through governance processes, with investigations and replies completed in a timely fashion. ICUs need to regularly review guidelines from professional organisations to ensure up to date best practice, along with updated evidence being translated into comprehensive local guidelines or standard operating procedures; these will require regular review and update Incident reporting, duty of candour (jurisdiction dependent) and appropriate action plans need to be documented and completed in a timely manner, with ICUs able to demonstrate learning and change from both significant incidents and good practice[5].

Data from key performance indicators needs to be reviewed, understood and shared. ICUs need to submit timely, good quality data to national benchmarking audits including the ICNARC Case Mix Programme or SIGSAG. Data collection for national audits needs to be funded.

Clinicians need to be able to demonstrate that they can access relevant guidelines and unit policies, including medication policies.

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4.4 Patient Safety Standards

Authors: Peter Hersey, Peter Bamford, Gary H Mills & Clare Windsor

INTRODUCTION

Adherence to the standards in this chapter will not remove all risk from ICUs. They have been selected as uncontroversial, evidence based, auditable safety standards that every unit must adopt. Most are not new or novel, but this doesn't devalue their importance. While some of the standards overlap with other chapters they are brought together here for emphasis and auditing purposes.

MINIMUM STANDARDS

1. Waveform capnography must be used to confirm endotracheal tube placement and continuously monitored for patients who are invasively ventilated[1].
2. Patients must be assessed daily for risk of thromboembolic disease and receive appropriate prophylaxis[2].
3. The type and placement of nasogastric feeding tubes (NGTs) used for enteral feeding, hydration and/or drug administration, must comply with National Patient Safety Agency guidelines[3].
4. There must be a robust system for reporting, investigating and learning from all patient safety incidents which includes pathways to trust/board-level governance committees (see Chapter 4.3 Clinical Governance).
5. Regular handwashing audits must show compliance with the WHO '5 moments of hand hygiene' and standard infection control precautions[4].
6. Two-dimensional (2-D) imaging ultrasound guidance must be used where cannulation of the internal jugular, axillary or femoral vessels is undertaken[5].
7. Each ICU must use local safety standards for invasive procedures (LocSSIPs), adapted from national safety standards for invasive procedures (NatSSIPs) where available[6,7].
8. Units must follow an evidence-based guideline for the prevention of ventilator associated pneumonia[8]. (See Chapter 3.6 Respiratory Support)
9. Rates of bloodstream, catheter associated, and ventilator associated infections must be monitored as part of a nosocomial infection surveillance system[9].

BACKGROUND AND EXPLANATION

Patient safety is an easy mantra to quote but complex to achieve. GPICS standards and recommendations are limited in their contribution to a true safety culture as they are unavoidably focused on process and outcomes. The ethos of this chapter however is to ensure that the basics are known to be done well. From this foundation, we hope that a quality improvement approach can be adopted, whereby ICUs are always mindful of areas of risk, and steps are taken to try and reduce those risks. It is equally important to be conscious of the near misses that can go unnoticed.

Intensive care services need to strive to adopt practices that are safe and work to eliminate common or recurrent issues. Local governance processes will maintain an awareness of risks, supported by resources such as the FICM Safety Bulletin and recurrent incidents report.[10]

While there is naturally an emphasis on investigating and learning from when things go wrong, there is an increasing recognition of the benefits of recognising and learning from things that go well.[11]

The NHS Patient Safety Strategy[12] is a useful resource for further guidance and background information.

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4.5 Environmental Sustainability

Authors: Sam Clark, Eleanor Damm, Rosie Cervera-Jackson, Heather Baid & Hugh Montgomery OBE

INTRODUCTION

The Intergovernmental Panel on Climate Change (IPCC) has warned "there is a rapidly closing window of opportunity to secure a liveable and sustainable future for all" and warns "the choices and actions implemented in this decade will have impacts now and for thousands of years"[1].

Current intensive care practice consumes large amounts of natural resources and generates high volumes of waste. The environmental footprint of an ICU is three times greater than a general ward[2].

Intensive care services have an obligation to mitigate pollution, biodiversity loss and climate breakdown, which threatens human health and survival. These actions are mandated by legal duties and strategic delivery plans, which inform organisation-level Green Plans[3-6].

Environmental sustainability requires a holistic view of the interconnectivity between ecological, financial, and social resourcing. This means adopting the principles of sustainable clinical practice to meet the present population's health needs, without compromising the ability of future generations to meet theirs[7].

MINIMUM STANDARDS

1. Environmental sustainability must be included at all stages, from construction to operation, when planning or redeveloping an intensive care area.
2. Statutory standards, such as the NHS Net Zero Building Standard (or equivalent standards)[8] must be followed.
3. The environmental cost of equipment and consumables must be included in all procurement evaluations and decisions.
4. Intensive care services must demonstrate compliance with current NHS standards for waste management[9].

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

1. Intensive care services should have a clinical lead (from within any clinical profession in intensive care) for environmental sustainability.
2. Environmental sustainability should be a regular and fixed agenda item in intensive care service quality meetings.
3. The topic of environmental sustainability should be included in departmental inductions and ongoing education programmes, accessible to all intensive care staff.
4. All quality improvement initiatives in ICUs should include an evaluation of sustainable value, which considers the environmental, social, and financial impacts of change, along with patient and population outcomes[7].
5. Intensive care services should demonstrate integration of evidence-based practices which avoid waste, whilst delivering safe and high-quality care in their daily routines[10].
6. Intensive care services should actively engage in initiatives to support the appropriate use of PPE, such as gloves awareness campaigns[11].
7. Evidence of adherence to the NIHR Carbon Reduction Guidelines should be sought as part of the approval process for research carried out in intensive care[12].
8. ICUs should collaborate at a regional level in support of efforts to improve environmental sustainability.

BACKGROUND AND EXPLANATION

Sustainability is an integral component of modern definitions of quality of care[13,14]. One method for planning sustainability interventions is to follow the four principles underpinning sustainable clinical practice: disease prevention and health promotion; patient education and empowerment; lean service delivery; and low carbon alternatives[15]. Achieving sustainable practice in intensive care will require multiple strategies[2].

Disease prevention and health promotion

Prevent, identify, and intervene in disease processes early by considering the three underlying determinants of health – social, economic, and environmental.

Example one: Optimise rehabilitation pathways to support better health for intensive care survivors and reduce dependency on others, limiting lost days of employment and lessening the medium to longer term social and economic impacts of critical illness.

Patient education and empowerment

Empower patients in the management of their health and healthcare, to reduce disease incidence, progression, and complications.

Example two: Adopt shared decision-making models in intensive care, such as Advance Care Planning protocols, to better align clinical decisions and interventions with the patient's goals and values[16].

Lean service delivery

Improve clinical decision-making in the selection and targeting of interventions and planning of care, to reduce lower value activities and their associated environmental impacts.

Example three: Obtain diagnostic tests in response to specific clinical questions, rather than as routine orders[10]

Low carbon alternatives

Include sustainability measures in the evaluation of medical technologies, allowing service planners, clinicians, and patients to choose clinically effective treatments with the best environmental profile, and encourage their further development.

Example four: Switch the prescribed route of medicines administration from intravenous to oral, when the route is available and appropriate, such as for paracetamol.

These principles and strategies, facilitated by regularly embedding sustainability into education, quality improvement, and research activity, ought to be the standard approach to planning and delivering intensive care. Example actions based upon the above minimum standards and recommendations to provide a quality service include:

- Having a clinical lead to direct sustainability initiatives within their ICU, who can engage with internal and external stakeholders and contribute to the local organisation's Green Plan.
- Regular discussion points for the topic environmental sustainability in quality meetings include planned or ongoing sustainable quality improvement work; review of updated policy, guidelines and procedural documents with a sustainability lens; and involvement in strategies beyond the unit, while pursuing the local organisation's Green Plan.
- Following sustainable procurement guidance such as NHS England's 'Applying net zero and social value in the procurement of NHS goods and services'[17] (or equivalent standards).
- Keeping staff up to date with current waste prevention programmes at organisational level and across the NHS; and ensuring that waste is identified and segregated correctly.
- Avoiding waste, whilst delivering safe and high-quality care in daily routines, including using minimal sedation and performing daily sedation breaks; and adhering to antimicrobial stewardship principles[10].
- Providing training and support to assist intensive care team members to undertake an informed risk assessment for selecting appropriate PPE, aligning with national infection prevention and control standards[18].

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Section 5

Preparedness

5.1 Capacity Management

Authors: Sam Waddy, Andy Georgiou & Ritoo Kapoor

INTRODUCTION

The management of intensive care capacity is complex. Intensive care teams are required to balance the needs of patients referred to them, as emergencies and as planned admissions after elective major surgical procedures, with the needs of the patients already under their care. Most of the UK has a low intensive care bed base per head of population which makes capacity management even more challenging and limits the ability to create safe expansion areas at times of high demand[1]. The COVID-19 pandemic brought this into sharp focus, and there is now greater understanding that surges in demand need to be managed at a regional (e.g. network) level, ensuring equity of intensive care access for patients.

MINIMUM STANDARDS

1. Acute hospitals must model their number of intensive care beds based upon expected need[2,3].
2. All ICUs in England must report their bed capacity to the national Directory of Services (DoS) twice a day and include a CRITCON score[4].
3. Intensive care must only be used for patients who require intensive care services with any breaches reported using the hospital incident reporting system.
4. The duty consultant and the duty nurse in charge of the ICU must jointly make the final decision on the safe utilisation of intensive care beds and this decision is not to be over-ridden[5].
5. ICUs must have documented capacity escalation plans suitable for their hospital facilities, which are reviewed routinely and ratified at board level.
6. ICUs must have an escalation policy which covers the exceptional circumstance of providing Level 3 care outside of the unit.
7. Transfer to other hospitals' ICUs to create capacity (inter-hospital capacity transfer or non-clinical transfer) must be conducted only when all internal options to avoid transfer have been exhausted.
8. Inter-hospital capacity transfers must be reported using the hospital incident reporting system, formally reviewed and reported to the executive team.
9. Inter-hospital capacity transfers for the purposes of facilitating elective surgery must be avoided[6].
10. Regional intensive care networks must have escalation plans documented and agreed at board level in hospitals, to allow the duty ICM consultant and duty nurse in charge to support the coordination and use of intensive care beds across the region.
11. Regional intensive care networks must have an agreed policy on escalation of care during times of high demand[7].

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

1. Health boards, networks and regions should model their number and location of intensive care beds based upon the expected need for their patient population.
2. To deliver a quality service, individual ICUs should contribute towards health boards, networks and regions having 10 intensive care beds per 100,000 people in their catchment population (aged 16 and over)[8,9].
3. All ICUs should model their occupancy and admissions to predict their daily emergency admission requirements and provide this information to hospital wide bed management to inform decisions before starting major elective surgical cases.
4. ICUs should have a policy for surge activity in exceptional circumstances such as major incidents and pandemics.

BACKGROUND AND EXPLANATION

The UK has just under 4,000 adult intensive care beds (Level 2 or 3) available and operates at around 81% capacity[1]. It has amongst the lowest number of intensive care beds compared to nations in the European Union (8.4 vs mean 15.9/100,000 population respectively), increasing pressure on intensive care capacity[10]. At least 465 operations are cancelled each month due to lack of intensive care bed capacity[11]. Determination of cancellation and causation is challenging, and this figure is likely an underestimate.

Calculating the expected need for intensive care beds will be based upon population, age, ethnicity, deprivation, patient pathways and elective vs non elective activity, as well as historic and any expected expansion of activity.

Operating at or near maximum capacity adversely affects patient mortality, length of stay and acuity of admissions[12]. When units operate at capacity, it is almost inevitable that only patients requiring immediate organ support are admitted to the detriment of others.

Ensuring there is a staffed bed(s) vacant for emergency admissions is an appropriate, straightforward method of ensuring timely admission. Plans to recreate this capacity may start as soon as it is used. Decisions to proceed with elective surgery will consider the provision of emergency capacity over the subsequent 24 hours and the likely discharges from intensive care.

Escalation planning

Decisions regarding how to manage capacity will require clinical oversight, considering individual patient need and likelihood of benefit from intensive care. The final decision on the safe utilisation of intensive care beds rests jointly with the duty consultant and the duty nurse in charge of the intensive care unit and their clinical decisions cannot be over-ridden[3].

Escalation plans at both organisational and regional (e.g. network) level are essential to manage the risks around limited capacity. Plans for surge events include location and design (such as all beds being capable of delivering Level 3 care), training (particularly for staff in escalation areas such as recovery and theatres), supervision (of staff used as part of escalation), equipment (to include devices, power and gas supplies for delivering Level 3 care) and staffing ratios. All units must have an escalation policy which covers exceptional circumstances. This includes incident reporting of the event, risk mitigation strategies and escalation to the executive team.

Executive teams at hospital board level need oversight of any escalation and the provision of intensive care outside of the ICU always needs to be regarded as exceptional. It is unsafe for intensive care to habitually use escalation areas and 'normalise' their use amongst both clinical and operational teams.

At a regional level, escalation plans might include:

- Escalation and repatriation between secondary and tertiary units.
- The process of escalation to and within the region/network, and when required, prioritisation of transfers over local elective activity.
- Agreed intensive care admission criteria and thresholds for restriction of planned activity to assist neighbouring ICUs during periods of extraordinary demand, e.g. pandemic or major incident scenarios.

Patients who are subjected to a non-clinical transfer have a longer ICU stay and are exposed to additional risks, so capacity transfer is still to be regarded as a system failure in all but the most extreme pandemic scenarios[11, 12, 13]. It is essential that ACC networks (or equivalent), health boards/trusts and NHS regions ensure that there are operational guidelines/principles in place to guide acute hospitals in decision making around capacity transfer to ensure patient-centred decisions are made. This might include transfers only once all physical beds are occupied and staffed, all elective surgery cancelled, all ward-fit patients discharged from intensive care, all reasonable efforts made to temporarily increase staffing, and no prospect to increase staffing by the oncoming shift.

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5.2 Surge and Business Continuity Planning

Authors: Andrew Johnston, Ascanio Tridente & Peter Shirley

INTRODUCTION

There is a requirement for surge and business continuity planning (BCP) for intensive care services. ICUs are high users of pharmaceuticals, oxygen, power, and consumables, and dependent on high levels of staffing for effective function. Any surge on service demand puts effective operational function at risk, where there may be interruptions in supplies, damage to (or unavailability of) infrastructure, or staffing shortages due to numerous possible incidents; hence reliable business continuity planning is essential. Rarely, the adult intensive care service may also be required to support paediatric units with capacity and need to be adequately prepared for this demand[1].

This chapter must be read in conjunction with other NHS guidance produced nationally in the various jurisdictions of the UK, including the Emergency Preparedness, Resilience and Response Framework and other relevant policy documents[2-5]. The aim of BCP for intensive care is to provide timely access to an appropriate level of care for patients to prevent avoidable mortality and morbidity and maximise capability within the system in a coordinated approach, until all potential escalation options have been exhausted. It sits in tangent with emergency preparedness, resilience and response (EPRR)[6].

MINIMUM STANDARDS

1. Hospitals with an ICU must have their own escalation plan and BCP.
2. Multi-site hospitals running more than one ICU must have flexible cross-site planning to help with surge and continuity planning.
3. Adult critical care networks, health boards and regions must have oversight to assist in the event of surge and BCP being activated.
4. ICUs must have local SOPs (including action cards and checklists) for disruption of business continuity including fire and evacuation surge, IT system failures and downtime, and major incidents.
5. ICUs must use recognised escalation scales to communicate resource strain either in the ICU or within the wider hospital (e.g. CRITCON and OPEL)[7,8].

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

1. As lack of intensive care capacity is frequently the rate-limiting factor in surge events, trusts/health boards should prospectively identify areas within their acute hospital sites to allow for expansion of intensive care capacity.
2. If increased activity is anticipated, the increase in requirement for consumables, including medical gas supplies, should be quantified in advance using the concept of 'days of supply'.
3. Business continuity plans should include a multidisciplinary approach with specific reference to pharmaceuticals.

BACKGROUND AND EXPLANATION

The objectives of surge and business continuity plans are to deliver a resilient intensive care service. They aim to target efforts to optimise safety to both staff and patients and to support clinicians by responding through clinical joint planning, information, intelligence, communication, resource identification, resource sharing, robust representation, or other influences. Plans will also aim to maintain equity of access for resource-utilisation and mutual-aid options for intensive care services across all sites, within networks and beyond. Escalation processes need to be coordinated through local area, regional and national teams and management structures (e.g. NHS England). Business continuity plans need to make specific reference to pharmaceuticals to ensure continuity of supply and appropriate storage of medicines. Experiences during the COVID-19 pandemic have highlighted the need for planning regarding medication for surge areas to be prioritised early, when potential excessive demands on intensive care beds are anticipated.

Mitigations may include the use of operating theatres, recovery, and augmented higher care areas, or upgrading Level 1/2 intensive care areas to permit mechanical ventilation and Level 3 care[9]. Intra-and inter-hospital capacity transfers are covered in GPICS Chapter 5.1 Capacity Management. Mitigations and expansion of capacity may also require consideration of essential equipment (and its procurement) and possible alternatives. Checklists need to include, for example, which drugs and consumables would run out first if supplies are disrupted.

The use of recognised escalation scales such as CRITCON (real-time observation and assessment of strain by clinical leaders in both routine circumstances and rapidly evolving situations, into a succinct communication score) for ICUs and OPEL (Operational Pressures Escalation Level) across wider NHS organisations enables the rapid communication of stresses and strains on organisations and links into local, regional and national escalation and action plans[7,8]. Communication and clinical response intelligence needs to be shared between clinicians and take place across sites to support sound decision making.

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5.3 Major Incidents

Authors: John Butler, Bernard Foëx & Joanne Thompson

INTRODUCTION

The NHS needs to be able to plan for and respond to a wide range of incidents and emergencies which could affect health or patient care. These could be anything from extreme weather conditions, an infectious diseases outbreak, a major transport accident, a cyber security incident or a terrorist attack[1].

A major incident is 'any occurrence that presents serious threat to the health of the community or causes such numbers or types of casualties, as to require special arrangements to be implemented.' Major incidents are exceptional events and often lead to an increase in demand for healthcare and intensive care services.

All acute healthcare organisations will have major incident response plans which set out how the organisation plans for, responds to, and recovers from major incidents and threats to business continuity. These plans need to be tested and regularly updated and are underpinned by legislation contained in the UK Civil Contingencies Act (CCA) 2004, the NHS Act 2006 and the Health and Care Act 2022[2]. This planning is referred to in the health service as emergency preparedness, resilience and response (EPRR). The plans dictate that all acute hospitals are to have an accountable emergency officer (AEO) responsible for EPRR. The AEO will be a board level director and have to publicly state the organisation's readiness and preparedness activities in the annual report.

MINIMUM STANDARDS

1. Acute hospital major incident plans must encompass intensive care medicine.
2. All hospitals designated receiving hospitals with Level 3 intensive care capability must have a plan to double their normal Level 3 ventilated capacity and to maintain this for up to 96 hours.
3. Clinical standards must be maintained during a major incident[3].
4. All hospitals must have an evacuation and shelter plan that includes evacuation and shelter of highly dependent patients, including, but not exclusively, intensive care patients, if the intensive care areas become unusable for any reason[4].
5. All hospitals must have a lockdown plan that includes all intensive care areas, to prevent unauthorised access.

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

1. The local intensive care leads should be involved in the formulation of acute hospital major incident plans.
2. Intensive care should have access to emergency planning and response training including strategic/crisis leadership.
3. Intensive care staff should participate in the local and regional multidisciplinary exercises including 'table-top' and 'live' exercises to further refine local and regional plans and communication routes between organisations and networks.
4. Intensive care leads should work with their EPRR team to facilitate exercises in the evacuation of very dependent patients from any part of their hospital.
5. Action cards should be available for all staff to use on activation of the plan, which include information and communication routes that are to be used.
6. Advance consideration of staff workforce requirements, including mutual aid from colleagues in other departments or neighbouring hospitals should form part of the intensive care service planning.
7. Staff welfare should be actively supported during an incident with access to informal, immediate debrief and later formal counselling.

BACKGROUND AND EXPLANATION

Under the NHS Constitution the NHS is there to help people when they need it; this is especially true during a major incident or emergency. The NHS Act 2006 requires NHS England to ensure that the NHS is properly prepared to deal with an emergency[5]. NHS England's EPRR guidance documents set out the legal and statutory responsibilities and includes a framework for mass casualty incidents. The AEO for EPRR will ensure robust and well-tested arrangements are in place to respond and recover from these situations.

Effective command and control are vital; the scale of the major incident determines where the top level sits. For the biggest incidents, (tier 4 - national) NHS England `may enact its powers under Section 252A of the NHS Act 2006 to take

national command and control of the NHS'. However, all staff need to be prepared to take on significant leadership roles in all phases of any emergency.

Core to their response is the concept that receiving hospital(s) will accept most of the sickest patients and that supporting hospitals will receive the less injured and may take transfers from receiving hospitals.

In order for receiving hospitals with Level 3 intensive care capability to be able to double their normal Level 3 capability their plan needs to include an inventory of where equipment is to come from, where the beds will be located and who will staff them. Ideally this will be near the permanent ICU, to allow normal functioning of the hospital around it.

Every effort has to be made to maintain clinical standards. As such, staff are strongly encouraged to use critical incident reporting and to keep contemporaneous notes to facilitate appropriate investigation of such incidents, and communication of lessons learned.

Although workforce planning aims to maintain staffing levels there needs to be an acceptance that when demand outstrips resources, normal staffing levels per patient may have to be compromised. This change in staffing levels needs to be planned or modelled in advance.

In a mass casualty incident, intensive care resources may be overwhelmed, with the requirement for triage, which needs to be considered and agreed nationally. This may lead to complex and difficult ethical decisions.

All staff working in intensive care need to know their specific role in the major incident plan, the command-and-control arrangement and information required. This will ideally be written on an action card to be read when an incident is declared and practised in advance of a major incident taking place. Workforce planning for the likely duration of the incident needs to take place early.

As part of preparedness for major incidents, including major internal disruptions, intensive care staff need to take part in evacuation exercises of very dependent patients from any part of the hospital. This will include practical skills such as using ski sheets and patient handling aids with adequate rehearsal plus planning in decision making and training for shift leaders making the decision to perform an evacuation.

The intensive care response may be of several weeks' duration and include frequent surgery for patients, as well as transferring patients to other hospitals. Being actively involved in the planning of exercises and having a full part while they are being run is essential.

After a major incident, the capacity of an individual healthcare organisation or site to provide optimal treatment for patients may be impaired for some time. It would be beneficial for organisations to collaboratively develop plans to assist each other under these circumstances[6].

Staff welfare during and after an incident response is paramount. Some may be affected significantly more than others, and for some weeks after the event. Support for staff is essential[7].

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5.4 High Consequence Infectious Diseases: Initial Isolation and Management

Authors: Stuart Dickson & Jake Dunning

INTRODUCTION

In the aftermath of the Ebola virus disease epidemic in West Africa and following experience of managing Middle East respiratory syndrome (MERS) cases in the UK, the High Consequence Infectious Diseases (HCID) programme was launched in England in 2015. The aim was to develop an effective and achievable end-to-end patient care pathway for individuals with suspected or confirmed infections due to high consequence pathogens. Additionally, public health agencies across the UK have issued interim guidance on managing specific HCID, such as MERS, avian influenza, and Ebola virus disease. While definitive care for confirmed patients in England will ultimately be delivered by commissioned HCID treatment centres, all acute healthcare organisations in the UK need to have processes in place to isolate and safely manage patients with suspected HCID while awaiting the results of investigations and/or prior to transfer. Contingency planning needs to consider how intensive care can be delivered locally to patients with suspected HCID.

Current HCID threats are described in UK Health Security Agency monthly HCID summaries[1].

MINIMUM STANDARDS

1. Each ICU must ensure that there are local contingency plans in place for the initial isolation and management of critically ill patients with suspected HCIDs.
2. Local contingency plans must be regularly practised and reviewed, including the use of table-top exercises and simulations.
3. ICUs must liaise with local Directors of Infection Prevention and Control to ensure the correct personal protective equipment (PPE) is procured and sufficient stocks are readily available for use by appropriately trained intensive care staff in the event it is required.

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

1. There should be a standard operating procedure in place to guide the management of a patient with a suspected HCID.
2. An intensive care consultant should have responsibility for intensive care aspects of local emergency planning and resilience preparations, incorporating plans for the appropriate isolation and management of suspected patients with HCID.
3. A clinical area where critically ill patients with a suspected HCID may be isolated, either within the ICU or elsewhere, should be prospectively identified and ideally utilising negative pressure rooms with anterooms where available.
4. All clinical equipment used in the management of a patient with a HCID should be dedicated to that patient alone and be single use where possible.
5. Training should be provided on a regular basis to ensure intensive care staff are familiar with using and safely removing PPE.
6. Staff should undergo annual fit testing of respiratory protective equipment (e.g. FFP3 masks).
7. Intensive care staff providing care for a patient with a suspected or confirmed HCID should be dedicated to the care of that patient on a clinical shift and not provide concurrent care for other patients, limiting the risk of cross-infection.
8. Contingency planning should incorporate plans for securely holding the large volume of clinical waste resulting from clinical care, including discarded contaminated PPE.
9. Patients with a suspected viral haemorrhagic fever should be risk assessed in accordance with the Advisory Committee on Dangerous Pathogens Viral Haemorrhagic Fever (ACDP VHF) Risk Assessment algorithm[2] and investigations to exclude malaria promptly undertaken, in keeping with local procedures.
10. Patients with suspected airborne HCIDs should be risk assessed according to national guidelines where they exist (disease-specific, e.g. MERS guidance collections[3,4] or generic airborne HCID guidelines, as appropriate).
11. ICUs accepting international medical transfers should have a mechanism by which to perform a risk assessment prior to transfer if a patient is being transferred from a country with known HCID outbreaks or countries where there is a significant risk of specific HCIDs; refer to national guidance (disease specific or generic HCID guidance).

BACKGROUND AND EXPLANATION

A HCID is one that may give rise to an acute severe illness with a significant case fatality rate, is highly transmissible from person to person (including healthcare providers), and so is capable of causing an outbreak or epidemic. The causative pathogens may be transmitted by contact (e.g. viral haemorrhagic fevers) and/or by airborne transmission (e.g. MERS coronavirus, avian influenza).

Patients with possible HCIDs may present to any hospital at any time. NHS healthcare organisations need to have in place emergency operational plans to deal with such an incident. Intensive care clinicians may be called upon to provide support to such patients pending results of diagnostics tests and/or transfer to a designated specialist centre (e.g. a commissioned HCID centre, for patients in England). This care may or may not be provided within the ICU. Contingency planning should identify an area that separates the contaminated clinical area from other areas, minimising the risk to patients, staff and the local community.

The local management of patients with a suspected HCID prior to transfer to a designated specialist centre will be dictated by local factors and hospital design. The stated standards and recommendations provide a framework for local contingency planning. There should be a standard operating procedure in place to guide the management of a patient with a suspected HCID. Following recognition of a patient with a suspected HCID:

- local infectious disease and/or microbiology and virology services need to be notified, and advice sought, including guidance on obtaining appropriate diagnostic clinical specimens.
- local clinicians need to liaise with the Imported Fever Service (note this service is available to clinicians across the UK) for further clinical advice and to facilitate access to specialist diagnostics as required[5].
- all suspected cases need to be reported immediately to local health protection authorities (e.g. the local health protection team).

The patient with a suspected HCID may, of course, subsequently prove to have an alternative diagnosis. Such patients may still be critically ill and are not to be disadvantaged by delays in instituting appropriate intensive care monitoring and support for fear of the presence of a HCID. However, healthcare organisations are obliged to ensure that appropriate infection prevention and control measures are maintained until the possibility of a HCID has been excluded. Therefore, it is vital that ICUs plan how such situations will be managed, minimising the risk of transmission to hospital staff, patients and visitors, while providing appropriate patient care without undue delay.

Healthcare workers in non-specialist hospitals need to rely upon appropriate infection prevention and control measures, including HCID-appropriate PPE, to protect them from the potential HCID pathogen. ICUs must liaise with local Directors of Infection Prevention and Control to ensure the correct personal protective equipment (PPE) is procured and sufficient stocks are readily available for use by appropriately trained intensive care staff in the event it is required. Information about PPE ensembles and other infection control measures for HCID is available in the NHS National Infection Prevention and Control Manual.

PPE has to be worn correctly if it is to provide adequate protection, and it will inevitably become contaminated during patient contact. Safe removal and disposal of PPE is a key skill in order to prevent inadvertent exposure to the infectious pathogen and needs to be practiced. Fit testing of respiratory protective equipment (e.g. FFP3 masks conforming to EN149:2001) needs to be undertaken before use and respiratory protective equipment should be fit-checked annually, and/or every time it is used.

A note on COVID-19 as a high consequence infectious disease

COVID-19 was provisionally made an HCID in January 2020. HCID status was removed in March 2020, following review of accumulated global data and the declaration of a pandemic, with the launch of a larger pandemic response plan for COVID-19[6].

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5.5 Fire and Evacuation

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INTRODUCTION

Evacuation of the ICU may be required due to an emergency such as fire, flood, structural failure of the building, or issues with power supply, oxygen or ventilation systems rendering the unit unsafe. As most patients in ICU are unable to self-evacuate and reliant on continuing organ support, emergency evacuation is particularly challenging and poses significant risks. There are well-documented events that have led to emergency evacuation due to fire both in the UK and abroad[1,2]. Appropriate design, planning and preparation can assist in ensuring the safety of staff, visitors and patients in such emergencies.

MINIMUM STANDARDS

1. All ICUs must have an appropriate number of well-marked and accessible fire call points, fire extinguishers (of appropriate type) and oxygen shut off valves[2-7].
2. All ICUs must comply with the latest health department regulations in their country regarding the fire-retardant nature of all furnishings, including mattresses, chairs, bedding, flooring and curtains[3,7].
3. All staff must undertake appropriate fire and evacuation training with regular updates in the clinical areas where they work[2,3,4,6,7].
4. All ICUs must have an emergency evacuation plan which is regularly reviewed[2,3,4,6,7].
5. Regional intensive care networks must have an agreed policy on escalation of care and mutual aid to ensure the safe provision of intensive care for all patients who require it in the region, including for a major incident in one ICU[5].
6. Portable oxygen cylinders must be stored safely in an appropriate holder or other designated storage area with the valve and flowmeter turned off in a location where they are readily available in an emergency but do not compromise potential evacuation routes.
7. Staff must ensure they follow recommendations for the safe use of oxygen cylinders at all times[1,2,4-7] and that any problem with oxygen cylinders or equipment is reported immediately to both the medical gas supplier and the Medicines and Healthcare products Regulatory Authority (MHRA)[5,7].

RECOMMENDATIONS TO PROVIDE A QUALITY SERVICE

1. ICU fire alarms should be audible throughout the department.
2. Ventilation of ICUs and other clinical areas where high-flow nasal oxygen, facemask continuous positive airway pressure and non-invasive ventilation are in use should be >10 air changes per hour to prevent oxygen enrichment of the ambient atmosphere[7,8].
3. Action cards should be displayed clearly at fire call points and other relevant places within the ICU, so that they are immediately accessible in an emergency[4,7].
4. A computerised fire alarm handler system should be installed in hospital switchboards to make it quicker and easier to liaise with the fire and rescue services[7].
5. All staff should know where to find the evacuation plan.
6. ICUs should have a system whereby staff involved in a critical event (such as a fire and emergency evacuation) receive debriefing and appropriate review for signs of a trauma stress reaction or post-traumatic stress disorder (PTSD)[4,7,9].
7. Each ICU's evacuation policy should link with the hospital major incident plan and be tested regularly, both as tabletop exercises and in simulation scenarios, including at night and out of hours[2,4,6].

BACKGROUND AND EXPLANATION

Emergency evacuation in the intensive care setting is both technically complex and ethically challenging.

Patients may be fully dependent on continuous organ support and care from staff. Undertaking emergency actions may have multiple repercussions. For example, shutting off the oxygen supply to help prevent the spread of fire may cause critical hypoxia or evacuating an area prematurely may put patients at risk whilst delaying may lead to injury or death.

In some circumstances, staff may be at a greater risk of harm than the patients they are caring for, for example in a smoke-filled room where the patient is intubated with a cuffed tracheal tube connected to a closed ventilator system. Most hospitals will have a phased evacuation plan that allows for certain areas that are most at risk to be evacuated first, ideally to other areas on the same floor ('horizontal' evacuation) which provides a degree of protection from the fire, before undertaking further complex evacuation to alternate floors ('vertical' evacuation) or full evacuation of the building. The hospital layout, evacuation plan and compartment barriers need to be considered when identifying alternative sites for the management of displaced ICU patients within the hospital including the need to negotiate stairs during an evacuation. Suitable alternatives may include PACU, operating theatres or enhanced medical units.

Unfortunately, these processes have been tested several times in the UK. In 2008 a fire at the Royal Marsden Hospital, London destroyed the ICU and led to a total evacuation with all ventilated patients transferred to a neighbouring hospital[2]. In 2011 in the Royal United Hospital in Bath an oxygen cylinder lying on a patient's bed caught fire as it was turned on, leading to a rapidly spreading fire with dense black smoke[1,4,10]. Both staff and a patient were injured before two doctors extinguished the fire. In 2017 at the Royal Stoke University Hospital, ICU patients were also evacuated to PACU and theatre areas when smoke entered the ICU following a fire. When an air conditioning unit caused a fire in the COVID-19 ICU at University Hospital Hairmyres, Glasgow in 2020 staff successfully evacuated 12 patients within seven minutes prior to the arrival of the Fire and Rescue Service with no staff injuries reported[11]. The high level of fire awareness and simulation training was cited as one of the key reasons for the positive outcome from this incident.

Multiple lessons from these incidents (and others) are incorporated into the above standards and recommendations. Further examples and details are outlined below:

- The importance of regular staff training in fire safety and oxygen cylinder use[1,2,3,4,6,7].
  - Follow the correct sequence for turning on a cylinder.
  - Utilise a designated device, such as bed bracket or dedicated holder, for an oxygen cylinder in use. Oxygen cylinders are not to be carried on the patient mattress/bedding when in use.
  - Ensure that cylinders are turned off after use and secured in the appropriate storage location.
  - Undertake regular, basic training in safe use of oxygen cylinders.
- The need for appropriate staff training covering topics such as[2,3,4,6,7]
  - Location and operation of fire call points
  - Location and appropriate selection of fire extinguishers
  - Location and operation of medical gas shut off valves
  - Location of emergency equipment including portable oxygen cylinders and evacuation equipment
  - For medical and senior nursing staff, training will include the method and implications of activating oxygen shut off valves and the practical use of fire extinguishers.
- Emergency evacuation plans need to cover[2,3,4,6,7]
  - Triage of patients for evacuation, including consideration of those nearest to the hazard and enacting reverse triage, where visitors and least unwell patients are evacuated first and the most unwell last.
  - Alternative locations within the hospital where intensive care may be provided.
  - Access to emergency equipment and medications (including ongoing supply of medications).
  - An evacuation case at each bed space and consideration of provision of evacuation aids such as ski pads or evacuation sheets.
  - The possibility of co-existent power failure
  - The use of alternative oxygen administration and/or ventilation devices, including the use of high-flow oxygen face masks, transport ventilators and manual ventilation.
  - Evacuation of patients reliant on additional mechanical support, including intra-aortic balloon pumps, renal replacement therapy and extra-corporeal life support (including consideration of temporary discontinuation of therapy, transfer with ongoing support or staff evacuation leaving patients in-situ) and those in bariatric beds that may require the use of alternative exit routes.
  - Transfer of hospital notes, especially where electronic monitoring and information systems are in use.
  - Relief of intensive care staff who may themselves have been affected by a fire and be unfit to continue to work.[1,2,4,7]
- Design of new build or updated ICUs which carefully consider the[2,3,6,7]
  - Provision of multiple exit routes
  - Separation of clinical and non-clinical areas
  - Adopting small bays with appropriate fire-resistant boundaries to aid compartmentalisation of fire, in preference to large open areas

  - Size of evacuation routes, including doors, to accommodate bariatric beds/chairs and essential medical equipment
  - Active and passive fire protection systems, including low level escape lighting, fire curtains, smoke dampers and automatic fire suppression systems.
- Regional intensive care networks can play a crucial role in such unusual situations including notifying neighbouring hospitals early, diverting emergency patients and temporary cessation of routine surgery as well as transfer of patients to alternative sites. Support from additional resources could be considered including mutual staff aid from other hospitals, specialist transfer and prehospital teams, and mutual aid from ambulance services including resources such as Hazard Area Response Teams (who may be able to provide additional equipment such as emergency oxygen supplies for multiple patients)[4,7].
- It would be beneficial for regional intensive care networks to develop systems to support the management of a major incident in one intensive care unit within the network, so that critically ill patients can be safely transferred and accommodated at other sites.
- Regular review of the ICU plan alongside the wider hospital major incident and emergency evacuation plans, will ensure integration with the wider command structure in the event of an emergency including liaison with the fire incident commander and other operational (bronze) and tactical (silver) commanders.
- It is vital to ensure that staff members who do suffer a trauma stress reaction receive appropriate care[4,7,9,11]. The value of debriefs, clinical psychologist input and a staff follow-up system to ensure this care is received is not to be underestimated. 77 members of staff required support after the fire in Glasgow[11] and the importance of this input was also noted following the 2011 incident in Bath[4,7,9]. The Trauma Resilience Management (TRiM) system is an example of a peer support tool, used in the military, which has been used successfully in healthcare and may be considered[9].

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Appendices

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FICM Legal and Ethical Policy Unit

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Appendix 3 | List of Standards and Recommendations

This appendix lists all standards and recommendations in GPICS separately from the narrative text and references, for ease of review.

CHAPTER 1.1 SCOPE OF ADULT INTENSIVE CARE

Minimum Standards

1	Intensive care services must be managerially led by a designated clinical director or lead consultant, a lead nurse or matron, and with dedicated operational support from a general manager or service manager.
2	Where the clinical director for the service is not a consultant in ICM, the clinical lead for intensive care must be a consultant in ICM.
3	Intensive care services must have access to a consultant in ICM available 24/7. (see Chapter 2.1 Consultant Staffing)
4	A consultant/specialist must be responsible for clinical decision-making, admission and discharge on the ICU. (see Chapter 2.1 Consultant Staffing)
5	Intensive care services must have an effective clinical governance structure and robust data collection with participation in national audit programmes for adult intensive care.
6	Intensive care services must declare occupancy, physical and staffed capacity and unit stress data through their relevant networks or reporting structures.
7	Hospital Trusts, Health Boards and Adult Critical Care Clinical Networks must regularly monitor intensive care provision for signs of potential intensive care stress as indicated by the metrics of delayed admissions, overnight discharges, admissions with four or more organ failures, readmissions and capacity transfers.
8	Intensive care services must ensure that there are robust surge plans in place which align to published guidance where it exists to ensure services are responsive to changes in demand.
9	Intensive care discharges must be discussed pre-emptively at hospital-wide daily bed management meetings and given the same level of priority as hospital admissions.

Recommendations to Provide a Quality Service

1	Guidelines for the Provision of Intensive Care Services should be the blueprint for safe and effective services.
2	Intensive care healthcare professionals should be consulted when acute hospital services are being reconfigured.
3	Enhanced care services should be developed to provide flexible patient care, including provision of non-invasive ventilation, improve patient flow in elective services, support operative scheduling and release capacity within intensive care.
4	Provision for the rehabilitation and follow-up of intensive care patients should be built into all service models of intensive care delivery.
5	Individuals appointed to a consultant post should be on the GMC specialist register for ICM.
6	Intensive care services should have a workforce strategy and delivery plan in place which includes multidisciplinary workforce development, support for staff health and wellbeing and implementation of new models of working.
7	Research and quality improvement (QI) should be an integral part of the work of the intensive care service evidenced through involvement in NIHR portfolio studies and national benchmarking data sets and QI programmes.
8	At intensive care discharge, plans for future treatment should be documented along with patients' wishes, values and preferences (if known) and included in discharge summaries to GPs.
9	Full 24/7 intensive care outreach services should be provided by team members with intensive care training in every hospital with an ICU.

CHAPTER 1.2 INTENSIVE CARE OUTCOMES

Minimum Standards

1	ICUs must hold multidisciplinary clinical governance meetings, including analysis of mortality and morbidity.

2	ICUs must participate in a National Audit Programme for Adult Critical Care.
3	ICUs must participate in a mortality review programme using appropriate methodology to maximise learning and improvements in care.
4	ICUs must participate in a programme of healthcare associated infection surveillance to monitor and benchmark infection rates.

Recommendations to Provide a Quality Service

1	ICUs should develop a consistent approach to patient-centred decision making, evaluating burdens and benefits of admission to intensive care, and be able to demonstrate this through the audit of pre-admission consultation, agreed ceilings of therapy, and time-limited treatment trials.
2	ICUs should develop and subsequently support implementation of a validated methodology to review referrals to intensive care which can evaluate decision making and subsequent outcomes relating to intensive care admission.
3	Longer-term mortality up to one year after ICU admission should be reported on all patients admitted to intensive care.
4	Validated measures of longer-term patient- and family-centred outcomes beyond mortality, including measures of functional ability, mental health, socioeconomic consequences, and carer burden, should be included in local and national audit programs.
5	ICUs should develop and subsequently support implementation of validated measures of quality of care relating to decision making, end of life care and bereavement.
6	ICUs should consider systematic assessment of patient and family experiences and demonstrate how these are used to guide improvement.

1.3 PHYSICAL FACILITIES

Minimum Standards

1	Intensive care facilities must meet all relevant UK healthcare building standards.
2	Derogations must be approved at Trust/Health Board executive level with documented reasons and resolution plans with an agreed timescale.
3	Adaptation or extension (colloquially, 'refurbishment') projects must be planned and benchmarked against the same standards as new buildings.
4	Where compliance is impossible, adaption or extension projects must demonstrate best intent and closest possible approximation to those standards within the constraints of the site.
5	The physical facilities of an ICU must be reviewed at (as a minimum) five-yearly intervals for continued fitness for purpose.
6	The layout and circulation of clinical spaces must be optimised for independent and collaborative staff working and shared visibility.
7	Clinical, operational and staff areas must comply with national workplace standards and Health and Safety guidance and legislation.
8	Unit layout must mitigate the impact of single rooms on patient and staff isolation, including staff safety.
9	There must be sufficient and accessible storage for diagnostic, technical and rehabilitation equipment and consumables.

Recommendations to Provide a Quality Service

1	In the case of major ICU projects, Trusts/Health Boards should involve clinicians in key decision-making including representative clinical leadership at Project Board level.
2	ICUs should be designed with best use of natural and artificial light, control of noise and concepts of biophilic environments in mind.
3	Requirement for single rooms and isolation rooms should be carefully evaluated against projected case-mix and future staffing impact.
4	Design of clinical spaces should minimise the visual and audible impact of clinical equipment for all users, and provide familiarity, communication and entertainment to maximise cognitive engagement for patients.

5	Facilities for families and visitors should be planned respectfully and to a standard comparable with other high-consequence facilities such as cancer centres or children's hospitals.
6	Flexible spaces for staff, including spaces for retreat, quiet working, and on-duty training and education, should be positioned to maintain immediate clinical availability.
7	Units should have provision for private office spaces for leadership, decision making, counselling and mentoring conversations.
8	ICUs should be designed for maximum resilience and unit safety, considering future infection control and pandemic compartmentalisation requirements, along with fire safety and emergency evacuation features in line with recent Intensive Care Society and Association of Anaesthetists guidelines.

1.4 CLINICAL INFORMATION SYSTEMS

Minimum Standards

1	All ICUs must have a CIS or a strategic plan for the implementation of one.
2	Procurement: CIS procurements and customisation must involve a multidisciplinary collaboration of stakeholders who would typically use, maintain and develop the system.
3	Compliance: The CIS must comply with applicable national guidelines, governance, clinical and technical safety standards.
4	Business Continuity: The CIS must have a rigorous business continuity plan (including contingency for power/system failure), with staff trained in its implementation available 24/7, always ensuring access to critical patient data; with no prolonged periods of routine downtime for planned updates or maintenance.
5	Hardware: There must be a dedicated workstation at each bed space, and an appropriate number of mobile and fixed devices on the ICU to meet the needs of medical, nursing and allied health staff.
6	Implementation: The NHS organisation and vendor company must have a robust plan for implementation of the CIS that supports all staff in its clinical and management use.
7	Training: The NHS organisation and vendor company must ensure the CIS is accompanied by a rolling programme of training for all end-users and stakeholders; prior to, during and after implementation; supported by clinical super-users and a multi-platform approach, with due consideration for temporary, rotating and ad-hoc users.
8	Post-implementation: The NHS organisation and vendor company must commit to ongoing product maintenance and development, to ensure the CIS keeps pace with the changing needs of intensive care, with 24/7 access to technical support available.
9	Integration: The CIS must automatically capture data from ventilators, patient monitoring and have interoperability with the core hospital patient administration system.
10	Scalability: The CIS must be scalable to accommodate surge capacity in multiple clinical locations.
11	System Safeguards: The CIS must have safeguards and warnings in place to prevent incorrect patient record entries.

Recommendations to Provide a Quality Service

1	Through a single sign-on, the CIS should be capable of bidirectional communication with key hospital systems involved in delivering patient care.
2	The CIS should be capable of prescribing and administration of medicines, including complex infusions, either directly or through integration with electronic Prescribing and Medicines Administration (PMA).
3	CISs should include automatic data capture from electronic devices used to deliver patient care, such as infusion pumps, renal replacement therapy (RRT) devices and cardiac output monitors.
4	The CIS should populate Critical Care Minimum Data Sets (CCMDS) and ICNARC Case Mix Programme /SICSAG data sets to facilitate benchmarking and governance.
5	The CIS should include embedded decision support tools and warning systems to ensure compliance with care bundles and alert staff to deteriorating patients.
6	The CIS should enable integration with NHS-approved systems including Artificial Intelligence (AI) tools.

7	The CIS should be developed to support activity related to intensive care, such as quality improvement, research rehabilitation and post-ICU follow-up, and intensive care outreach services.

1.5 CLINICAL EQUIPMENT

Minimum Standards

1	All equipment must conform to the relevant safety standards.
2	All equipment must be regularly serviced and maintained in accordance with the manufacturer's guidance.
3	An uninterruptable power supply must be provided, adequate to provide at least one hour of continuity of any critical equipment that does not have battery back-up.
4	Equipment must be uniquely identified and listed on an appropriate asset register along with details of its life cycle and service history/requirements to facilitate planned maintenance and replacement.
5	Sufficient equipment must be available to meet the service demand for patient care in a clinically appropriate timescale, including in periods of surge.
6	ICUs must have appropriate systems in place to ensure an adequate supply of consumables.
7	There must be a designated equipment clinical lead for intensive care.
8	All staff must be appropriately trained, competent and familiar with equipment they are expected to use independently.
9	Electro-biomedical engineering (EBME) support must be available either in-house or on a contracted basis to ensure equipment is appropriately serviced.
10	There must be appropriate sterile services and documented procedures for decontamination of equipment.
11	There must be a robust mechanism for reporting adverse incidents resulting from the use of clinical equipment and responding to national safety alerts.
12	ICUs must have the facility to store clinical and point-of-care ultrasound images in an appropriate picture archiving and communication system, so they form part of the clinical record.
13	There must be an appropriate archiving system for diagnostic images which can be safely retained and be available for clinical review for the same duration of the patient record.

Recommendations to Provide a Quality Services

1	Equipment, wherever possible, should be standardised, both in ICU and across intensive care services that have more than one unit, and in other areas where elevated levels of clinical care may need to be delivered.
2	Equipment, wherever possible, should have the ability to transmit data to clinical information systems and core hospital patient administration systems.
3	There should be indemnity and governance policies in place for loan equipment.

1.6 INTENSIVE CARE ULTRASOUND

Minimum Standards

1	ICUs must have the equipment to provide point of care intensive care ultrasound.
2	Ultrasound machines must be equipped with linear, curvilinear, and phased array probes.
3	Ultrasound equipment must be readily available, serviced regularly and part of a capital replacement program.
4	ICUs must have a clinical lead for ultrasound.
5	Dedicated infection control guidance must be accessible and its compliance audited.
6	Providers who scan and report independently must be trained to an appropriate level for their clinical practice.
7	When performing scans to inform clinical decision making, providers must store a structured report in the patient record.
8	When performing scans to inform clinical decision making, providers must store images for quality assurance purposes.

9	When performing scans for training purposes, learners must only store reports in the patient record if a trained provider has verified them first.
10	Transoesophageal echocardiography (TOE) must be immediately available in all cardiothoracic ICUs and those units providing extra-corporeal circulatory support.
11	ICUs must have the facility to store clinical and point-of-care ultrasound images in an appropriate picture archiving and communication system, so they form part of the clinical record.

Recommendations to Provide a Quality Service

1	All ICUs should be able to train staff in intensive care ultrasound.
2	ICUs that engage in remote review and/or supervision should employ secure, cloud-based image transfer systems.
3	The clinical lead for ultrasound should have sufficient time in their job plan for the associated quality assurance processes.
4	The intensive care ultrasound service should be supported by a fully trained link-person within the cardiology and radiology departments, as appropriate.
5	ICUs should provide dedicated education and ultrasound governance meetings.
6	ICUs should foster robust quality assurance processes, including peer review of image and reporting quality.

1.7 CRITICAL CARE OUTREACH, RAPID RESPONSE SYSTEMS AND EARLY INTERVENTION

Minimum Standards

1	There must be a hospital wide, standardised approach to the detection of the deteriorating patient and a clearly documented escalation process, including to intensive care, available 24 hours a day, seven days a week.
2	All acute hospitals must use a validated track and trigger early warning score system that allows rapid detection of the signs of early clinical deterioration in all adult patients over 16 years and includes escalation procedures to intensive care services.
3	Hospital policies must clearly outline graded, patient escalation pathways, including through to intensive care services, as required.
4	Hospitals must ensure there is a clinical review of all patients with a NEWS ≥5 (or equivalent if NEWS2 not in use), a score of 3 in a single parameter or any clinical concern via a rapid response system incorporating intensive care expertise.
5	There must be clear governance through audit of track and trigger response systems and action of poor compliance healthcare organisation wide, reportable at board level.
6	Hospitals must ensure patients receive care from appropriately trained critical care outreach, rapid response or equivalent teams.
7	All patients must be reviewed by CCOT (or equivalent) following discharge from the intensive care unit to the ward, due to increased risk of deterioration post-ICU for as long as they are at risk (and at least in the first 24 hours).
8	All critical care outreach teams within acute hospitals in England and Wales must use the National Outreach Forum national minimum dataset for collating metrics on critical care outreach/rapid response team activity in order to provide clear data for benchmarking on their outcomes and activity.

Recommendations to Provide a Quality Service

1	There should be regular (quarterly and annual) review of activity to review service provision, and liaison with the appropriate patient safety champions and committees in the hospital.
2	Critical care outreach should sit within intensive care directorates to ensure rapid access to intensive care facilities, provision and professional support, as needed.
3	Critical care outreach staff, whether they sit within or outside intensive care directorates, should possess intensive care competency (enhanced, advanced, consultant), and achieve the competency level set out as part of their role description and in line with the Critical Care Outreach Practitioner (CCOP) Framework.
4	Acute kidney injury alerts, or similar pathological markers, should work in concert with any track and trigger early warning score system to ensure recognition of deteriorating and at-risk patients.

5	There should be a patient/carer activated system, supported by critical care outreach services, for escalating concerns about deteriorating patients all the way up to intensive care, through mechanisms such as Call for Concern.
6	There should be accessible educational support for registered and non-registered ward staff in caring for the acutely ill and deteriorating ward patient supported by critical care outreach and rapid response teams.

1.8 CARDIOTHORACIC CRITICAL CARE

Minimum Standards

1	ICM Consultants providing out of hours Cardiothoracic intensive care and advice must have regular daytime timetabled sessions in cardiothoracic intensive care.
2	Staffing must adhere to the minimum standards outlined in the relevant staffing chapters of GPICS V3.
3	In addition to the on-site medical doctor or ACCP, there must be a cardiothoracic surgeon.
4	There must be 24/7 access to staff with advanced airway skills.
5	Clinical perfusion services, theatre staff and appropriate facilities must be readily available for emergency resternotomy and cardiopulmonary bypass 24/7.
6	Those on the on-site rota must be trained in Cardiac Surgery Advanced Life Support (CALS) and capable of chest reopening 24/7.
7	The equipment to perform transoesophageal echocardiography (TOE) must be available immediately in all cardiothoracic ICUs and those units providing extra-corporeal circulatory support, with access to a clinician competent in TOE readily available 24/7.
8	The care for all cardiothoracic surgery patients must meet the requirements of similar patients cared for in a general ICU as per GPICS standards.
9	The care of patients within each cardiothoracic intensive care area must be directed by a job-planned consultant in cardiothoracic intensive care medicine, through a structured bedside ward round that involves access to multidisciplinary input 7/7.

Recommendations to Provide a Quality Service

1	Cardiothoracic ICUs should have local acute heart failure patient pathways to provide 24/7 access to multidisciplinary review and consideration for advanced heart failure therapies.
2	There should be an Enhanced Recovery after Surgery (ERAS) lead nurse or consultant within cardiothoracic intensive care to drive enhanced recovery protocols.
3	Prehabilitation of frail or high-risk cardiothoracic surgical patients should be available from a multidisciplinary allied health professional team.
4	Multidisciplinary decision making that includes advanced care planning should be undertaken with high-risk or complex cardiothoracic surgical patients as part of the consent process prior to surgery.
5	Transfer policies should be developed within tertiary referral centres to facilitate efficient transfer in of patients requiring cardiothoracic surgery and repatriation of cardiothoracic surgery and cardiology patients back to base hospital for ongoing care.
6	Centres in which primary percutaneous coronary interventions (PCI) are performed 24/7 or designated heart attack centres should consider developing protocols for the identification of and immediate management of patients suitable for extracorporeal cardiopulmonary resuscitation (eCPR).

1.9 NEUROCRITICAL CARE

Minimum Standards

1	Staffing must adhere to the minimum standards outlined in the relevant staffing chapters of GPICS V3.
2	ICM Consultants providing out of hours neurocritical care and advice must have regular timetabled sessions in neurocritical care.
3	Neurocritical care units must have access to appropriate clinical expertise from the following specialist services: neurosurgery, spinal surgery, neurology, stroke, diagnostic and interventional neuroradiology, neurophysiology and neurorehabilitation.

4	Staffing must adhere to the minimum standards outlined in the relevant staffing chapters of GPICS V3.
5	Neurocritical care units must have access to appropriate equipment and facilities and clinical expertise in their use and interpretation.
6	All patients requiring immediate lifesaving neurosurgery must be admitted to the local neurosurgical centre irrespective of the initial availability of neurocritical care beds.
7	All ICUs which may manage patients following traumatic brain injury must have up to date policies which follow national and international guidance, including discussion with specialists and, if required, transfer to a specialist centre.
8	Neurocritical care must have resources to support and be part of regional networks for the safe and timely management of all patients with relevant brain and spine pathologies, with agreed rational transfer and repatriation policies.
9	There must be processes in place within regional critical care networks to request advice from their respective local neurointensive care services (in addition to neurosurgery and neurology), which is documented and forms part of the patient record.
10	The care of patients within each neuro intensive care area must be directed by a job-planned consultant trained in neuro intensive care through a structured bedside ward round that involves access to multidisciplinary input 7/7.
11	The care for all neuroscience patients must meet the requirements of similar patients cared for in a general ICU as per GPICS standards.
Recommendations to Provide a Quality Service	
1	Neurocritical care units should seek to develop expertise in additional specialist equipment and facilities.
2	Neurocritical care units should have access to specialist clinical expertise from neuropsychology.
3	Neurocritical care patients' long-term outcome should be assessed at three months or later, in all needed adults who were admitted for more than four days, ideally in specialist neurocritical care follow-up clinics.

1.10 BURNS CARE

Minimum Standards	
1	Working practices must promote multidisciplinary care between the burn and intensive care teams, encouraging joint decision making in line with British Burns Association standards.
2	A burns theatre must be located in close proximity (preferably within 50 metres) to any service providing intensive care for burn injured patients.
3	Burns patients requiring intensive care must be jointly managed by consultants in burns surgery and intensive care medicine with the appropriate level of burns specific training.
4	Clinical guidelines for treatment and care related specifically to burns patients must be available in ICUs which manage burns patients.
5	Thresholds for referral to adult and paediatric burns services must be adhered to, as detailed by the National Burn Care Referral Guidance.
6	Transfer of critically ill burn patients between services must comply with Intensive Care Society guidelines.
Recommendations to Provide a Quality Service	
1	Services should have access to specialist care pathways to meet the needs of patients with mental health issues and those frail and elderly.
2	All burns over 20% total body surface area (TBSA) should have access to thermally controlled single-bedded cubicles.
3	Services providing burns centre level care should be, ideally, co-located with a major trauma centre.
4	Where burns centre level care cannot be co-located with a major trauma centre mechanisms for ensuring appropriate integration with major trauma centre care should be established.
5	The implementation of end-of-life care in the early stage of a burn injury should only be made following multidisciplinary holistic assessment, involving at least two consultants, one of whom should be a specialised burn care surgeon and the other an intensivist with experience in burns care.

6	There should be nominated intensive care and anaesthesia lead consultants for burns, who participate in network, regional and national clinical governance activities, morbidity and mortality audit meetings.
7	Where arrangements are in place for shared care between nursing teams from the burn care ward and ICU, there should be a minimum of one nurse each shift with CC3N specialist burn competencies.
8	In ICUs in Burns Centres and Burns Units, 75% of nursing staff should have CC3N specialist burn competencies.

1.11 SMALLER, REMOTE AND RURAL INTENSIVE CARE UNITS

Minimum Standards

1	ACC network/regional support must be provided to ensure small and remote units meet GPICS.
2	There must be access to advice from a consultant in ICM 24/7 (see Chapter 2.1 Consultant Staffing).
3	There must be a 24/7 dedicated on-site medical doctor and ACCP rota for the ICU (see Chapter 2.4 On-site Medical Doctor and ACCP Rota).
4	All ICUs must have immediate 24/7 on-site access to staff with a minimum standardised airway skillset (see Chapter 2.4 On-site Medical Doctor and ACCP rota).
5	Regional transport arrangements (road and air) must be agreed to allow timely, safe transfer of patients with an appropriate level of monitoring, staffing, and skills (see Chapter 3.14 Inter- and Intra- hospital transfer).
6	ICUs, including Level 2 units, must participate in a national patient outcome benchmarking audit.

Recommendations to Provide a Quality Service

1	Network support should be explicit, resourced and supported by all stakeholder healthcare organisations, including trusts/health boards, and regional networks and structures.
2	ICUs should consider the development of telemedicine (digitally enabled remote intensive care) techniques for clinical decision making and educational support, in conjunction with their regional network and specialist centres.
3	Remote ICUs should implement appropriate joint clinical governance procedures with both networked units and transfer services.
4	Where an intensive care pharmacist, practitioner psychologist or AHP service, cannot be effectively delivered locally in a small unit, advice should be accessible from specialist colleagues through network support.
5	Training bodies should devise and support remote and rural training posts in intensive care.
6	Small and remote units should, where practical and feasible, implement cross site working for all multidisciplinary staff to maintain retention of skills and training.

1.12 ENHANCED CARE

Minimum Standards

1	Enhanced care services must sit within a designated lead directorate, engage in appropriate national data collection, and utilise patient, carer and service user feedback to improve services.
2	There must be a clear leadership structure with a designated lead clinician and lead nurse.
3	To promote a cohesive well-functioning unit, all specialties and clinical leads interfacing with the Enhanced Care service, including intensive care, must meet on a regular basis.
4	There must be clear operational Standard Operating Procedures (SOPs) covering admission, daily operations, transfer and discharge.
5	There must be twice daily senior clinical decision maker documented review with one being a consultant-led ward round with the nurse-in-charge with input from other appropriate MDT members.
6	There must be clear clinical escalation procedures to Level 2 or Level 3 intensive care in the event of patient deterioration.
7	Enhanced care units that do not have on-site intensive care services must have the ability to treat and stabilise patients, with an established agreement with the local intensive care service and transfer services to move patients when escalation to intensive care is deemed appropriate.

8	There must be regular multidisciplinary governance meetings.
9	There must be clear policies on the level of monitoring and treatment appropriate to the needs of the patient group and the enhanced care unit.
10	There must be a robust handover policy, including documentation of clear parameters for further escalation.
11	All patients admitted to an enhanced care unit must have a documented and agreed Treatment Escalation Plan (TEP).
12	The TEP must be reviewed at the time of discharge, including suitability of re-admission for enhanced care and/or intensive care.

Recommendations to Provide a Quality Service

1	Enhanced care units should refer to the relevant curriculum and published guidance to determine the grade of doctor or Advanced Clinical Practitioner most appropriate to deliver care.
2	Registered practitioners working in Enhanced Care areas should meet the 'National Competency Framework for registered practitioners: Level 1 and Enhanced Care Areas'.
3	The registered nurse:patient ratio should match patient acuity, skill mix, volume of work and the variety of services offered.

1.13 INTERACTION WITH OTHER SERVICES: MICROBIOLOGY, PATHOLOGY, LIAISON PSYCHIATRY AND RADIOLOGY

Minimum Standards

1	Telephone advice from a microbiologist must be available 24/7.
2	Further interpretation and clinical advice from the relevant consultant pathologist or clinical scientist must be available 24/7.
3	Clinical pathology and radiology providers must have systems in place to identify and rapidly communicate critical or unexpected results.
4	Clinicians must have robust mechanisms in place so that appropriate action is taken following rapid communication of critical and unexpected results.
5	A radiologist must be immediately contactable to support the diagnostic management of acutely ill patients at all times.
6	Units that provide acute care must have access to interventional radiology (IR) services either onsite or by formal arrangement to transfer to a site where the service is available.
7	Imaging and reporting for patients with critical conditions must be prioritised.
8	Liaison psychiatry services must review all mental healthcare referrals within 24 hours of referral.

Recommendations to Provide a Quality Service

1	There should be planned microbiology input to patient care on a daily basis; regular 'in person' ward rounds to facilitate team discussion and learning are preferred.
2	Liaison psychiatry staff should be available to advise acute colleagues on issues around mental capacity.
3	Regular clinico-radiological meetings should occur to facilitate team discussion and shared learning.

1.14 PROLONGED MECHANICAL VENTILATION AND COMPLEX HOME MECHANICAL VENTILATION SERVICES

Minimum Standards

1	There must be a referral pathway to a SWU/complex HMV service which any intensive care unit can access for advice and/or assessment.
2	Patients receiving PMV must be managed by a multidisciplinary team with specialist expertise and experience in managing this patient group.
3	Any plan for advice from, assessment by, or transfer to a regional SWU must be made in collaboration with the patient and their family and documented in the medical record.

4	Locally agreed protocols must be in place to define which other patients are discussed with the regional SWU/complex HMV centre.

Recommendations to Provide a Quality Service

1	All patients with single-organ respiratory failure (continued invasive mechanical ventilation but no other acute organ support) at day 21 of their intensive care stay should have a documented review focused on the potential merit of referral to the regional SWU/complex HMV centre for advice, assessment or transfer.
2	Patients with pre-existing comorbid conditions associated with weaning difficulties should be referred to the regional SWU/complex HMV centre at the soonest practical time-point of their intensive care stay.
3	The SWU/complex HMV centre should be staffed with a multidisciplinary team as outlined in the ICS/BTS SWU document.
4	Patients under the care of a regional complex HMV service, admitted to an ICU in another hospital, who are unable to be weaned to their baseline level of ventilation, should be transferred to the hospital where the regional complex HMV service is located at the soonest practical time-point of their intensive care stay.
5	The regional SWU/complex HMV service should be involved in hospital discharge planning and carer training for patients discharged home with HMV.
6	The care of patients receiving PMV who meet the criteria for discussion with SWU/complex HMV services should undergo careful review and ongoing audit including submission of data to a national database if available.

1.15 CRITICAL CARE NETWORKS

Minimum Standards

1	Networks must develop, agree, and implement best practice pathways across the network that support improved patient flow and effectiveness of care.
2	Networks must monitor demand and capacity; working with network member organisations to have oversight of pathways and develop services.
3	Networks must work to reduce unwarranted variation in pathways and processes, including by working with other related networks.
4	Networks must monitor and improve quality, safety, experience, and outcomes according to the standards of the network service specification.
5	Networks must benchmark services nationally and with other networks to identify good practice and innovation though peer review and other network governance activities.
6	Networks must increase network effectiveness through training and development; identifying opportunities aligned with the network plan and assessing future workforce needs for the team.
7	Networks must identify and manage service risks through regional and system quality structures, following agreed escalation processes through their annual work programmes.
8	Networks must link and share best practice with all partners locally, regionally and nationally, identifying opportunities for shared solutions and resources.

Recommendations to Provide a Quality Service

1	Networks should support the development and implementation of extended health and wellbeing measures that enable staff to practice safely.
2	Networks should plan for capacity management at times of increased demand, including surge planning and mutual aid within and between networks.
3	Networks should contribute to the design of measures of quality, safety, and patient experience (through metrics that are SMART and widely captured).
4	Networks should evaluate the impact of any changes on quality, safety, experience, and outcomes across the whole pathway and identify vulnerable groups experiencing gaps in access, experience, and outcomes.

1.16 COMMISSIONING (ENGLAND)

Minimum Standards

1	All ICUs must comply with any national commissioning arrangements as set out in relevant service specifications.
2	All providers must contribute case mix and outcome data to peer audit.
3	CCMDS3 must be collected and reported in all designated adult critical care locations.
4	Adult critical care reference cost submissions must assign costs to individual HRGs.
5	All providers must submit data to the Specialised Services Quality dashboard.
6	All providers must submit data twice daily to the National Directory of Service.
7	All providers of adult critical care must be members of an ACC network.

Recommendations to Provide a Quality Service

1	Trained personnel should collect all 34 fields in CCMDS.
2	There should be clinical oversight of the CCMDS data entry/data submission to ensure accuracy of data.
3	Preparation of reference costs should include experienced clinician involvement.

1.17 COMMISSIONING (SCOTLAND, WALES, NORTHERN IRELAND)

Minimum Standards

1	All ICUs must comply with any national commissioning arrangements as set out in relevant service specifications.
2	All providers must contribute case mix and outcome data to peer audit.
3	In Scotland, all intensive care providers must contribute case mix and outcome data to peer audit via the SICSAG national audit.
4	In Wales, the Critical Care Minimum Dataset (CCMDS) must be collected and reported in all designated Adult Critical Care locations.
5	In Wales, all providers of adult intensive care must be members of the National Strategic Clinical Network for Critical Care, Trauma and Emergency Medicine.

Recommendations to provide a quality service

1	In Wales and Northern Ireland (as well as England see Chapter 1.16), trained personal should collect all 34 fields in CCMDS.
2	In Wales and Northern Ireland (as well as England see Chapter 1.16), there should be clinical oversight of the CCMDS data entry/data submission to ensure accuracy of data.
3	All providers of adult intensive care should be members of an intensive care network.

2.1 CONSULTANT STAFFING

Minimum Standards

1	There must be a designated clinical director and/or lead consultant for ICM.
2	A consultant in ICM must lead patient care on the ICU during the daytime, seven days a week.
3	The daytime consultant in ICM to patient ratio must not normally exceed a range between 1:8 and 1:12.
4	A consultant in ICM must undertake ward rounds twice a day, one of which will be face-to-face, seven days a week.
5	If specialists are locally approved to provide consultant equivalent clinical activities, they must have access to advice from a consultant in ICM 24/7.
6	ICUs that remain staffed out of hours by non-intensive care consultants must have access to advice from a consultant in ICM 24/7.
7	A consultant/specialist must be responsible for clinical decision-making, admission and discharge on the ICU.

8	A consultant/specialist responsible for the ICU must be immediately available 24/7 (i.e., continually contactable and, if non-resident, able to attend within 30 minutes).
9	A consultant/specialist with any clinical commitment to intensive care, providing in or after-hours patient care, must have a minimum of 2 programmed activities (PAs) devoted to acute ICM within their job plan.
10	Daytime direct clinical care (DCC) PAs in ICM must be exclusively in ICM, with no additional responsibility for a second specialty at the same time.
11	Supporting professional activities (SPAs) must be recognised with a minimum 1.5 PAs for individual consultant revalidation requirements.
Recommendations to Provide a Quality Service	
1	Consultant work patterns should be designed to facilitate continuity of care within the constraints of providing a sustainable out-of-hours service and workforce.
2	The consultant rota should avoid excessive periods (> 24 hours) of sole direct patient consultant responsibility.
3	A mechanism for consultant-to-consultant handover should be in place.
4	A consultant in ICM job plan should have a minimum of 4 DCC PAs in total, of which at least 2 are daytime DCC PAs.
5	All DCC PAs in ICM should be exclusively in ICM, with no additional responsibility for a second specialty at the same time.
6	Additional responsibilities for SPA activities should be recognised within job planned activities, and appropriate time allocated.
7	Sufficient DCC should be job planned to support relevant non-patient facing clinical (patient related) activities such as writing Coroner/Procurator Fiscal reports and responding to incidents and complaints.
8	There should be daily access to multidisciplinary input from nursing (bedside and nurse-in-charge), microbiology, pharmacy and physiotherapy for clinical decision making.
9	There should be readily accessible input from dietetics, speech and language therapy, occupational therapy, and clinical psychology as required, to assist decision making.

2.2 NON-CONSULTANT MEDICAL DOCTORS

Minimum standards	
1	Guidelines and resources to support day-to-day ICU practice must be accessible to ICU doctors.
2	All ICU doctors must have a designated educational/clinical supervisor or SAS tutor.
3	All ICU doctors not in formal training must have an appraiser for revalidation.
4	All intensive care training units must have a FICM-appointed Faculty Tutor.
5	All ICU doctors must have an agreed Personal Development Plan (PDP) relevant and realistic to their developmental needs.
6	Doctors in specialty training on the ICU must be provided with the opportunity to fulfil the relevant competences and requirements of their specialty curriculum.
Recommendations to Provide a Quality Service	
1	Educational/clinical supervisors, SAS tutors and appraisers should be allocated sufficient time in their job plan to fulfil their role.
2	Faculty Tutor's should maintain an overview of ICU development, education and training to ensure opportunities are provided to all ICU doctors.
3	Faculty Tutors should perform the Training Capacity Assessment exercise yearly.
4	There should be a regular medical teaching for ICU doctors and protected time to attend.
5	ICU doctors should be supported to attend ICU Morbidity and Mortality, governance and quality improvement meetings.
6	Educational Development Time should be designated on the rota as protected time.

7	The development, education and training of ICU doctors should be regularly reviewed through a local quality assurance process.

2.3 ADVANCED CRITICAL CARE PRACTITIONERS

Minimum Standards

1	ACCPs must act within the formal code of conduct of their present statutory regulator, acknowledging any limitations in their knowledge and skills.
2	ACCPs must work to an agreed scope of practice with clearly defined standard operating procedures and local governance arrangements.
3	ICUs employing ACCPs must ensure the ACCP standard operating procedures are regularly reviewed as part of the unit's governance arrangements.
4	As part of training and ongoing professional development, ACCPs must develop a high level of clinical judgment and decision-making, evidenced by adherence to and meeting the capability portfolio requirements of FICM ACCP curriculum 2023.
5	ICUs who employ or train ACCPs must have an ICM consultant lead for ACCPs.
6	Trainee ACCPs must practice for two-years in a completely supernumerary capacity within the required structure of the FICM ACCP curriculum and with the appropriate level of supervision.
7	ACCPs must meet the requirements of their base professional regulator.
8	Continuing professional development (CPD/appraisal) for ACCPs must be carried out on an annual basis according to FICM CPD/appraisal guidance and which meets revalidation requirements of their base professional regulator.

Recommendations to Provide a Quality Service

1	ACCPs should gain FICM ACCP membership.
2	ACCP line management should be a tripartite arrangement between the ICM Consultant Lead for ACCPs, clinical supervisor and the professional lead from the ACCPs base profession (or Lead ACCP where in post).
3	ICUs employing or training ACCPs should ensure working conditions in line with the FICM Sustainable Career Pathway to help to retain senior ACCPs.
4	ACCPs should work autonomously within their scope of practice within a multi-disciplinary team led by an ICM Consultant to deliver care to critically ill patients.
5	ACCPs should be independent prescribers whilst working autonomously within scope of practice within statutory limitations.
6	Employing units should aim to train and/or appoint those practitioners eligible for, or holding, FICM ACCP membership to ensure they practice at a national standard of knowledge base and minimum skillset in meeting the FICM ACCP Curriculum capabilities.
7	ACCPs should have dedicated supporting professional activity (SPA) time alongside clinical commitments recognised within their job plan (i.e. 80/20 split) to meet the requirements of the other pillars of advanced practice.
8	ACCPs should be supported, where appropriate, to progress towards completing appropriate Advanced Additional Skills Framework.

2.4 ON-SITE MEDICAL DOCTOR AND ACCP ROTAS

Minimum Standards

1	The rota must comply with any contractual obligations, such as the 2003 Working Time Directive.
2	The staff to patient ratio must not normally exceed 1:8 24/7.
3	All staff included in this rota must have training in basic airway skills.
4	All ICUs must have immediate 24/7 access to staff with a minimum standardised airway skillset.

5	All ICUs must have 24/7 on-site access to staff with advanced airway skills.
6	The rota must be cognisant of fatigue and risk of burnout.
7	Rest facilities, including areas for resting after night shifts, drinks and hot food must be available 24/7.

Recommendations to Provide a Quality Service

1	Staffing levels should be increased if local arrangements necessitate providing emergency care outside of the ICU (e.g. wards, emergency department, transfers).
2	Leave (both professional and personal) should be acknowledged and, where possible, agreed if requested with a minimum six weeks in advance.
3	The rota should be designed to have appropriate, adequate educational and resource support to aid career development, retention and sustainability.
4	Mandatory speciality teaching attendance time should be protected.
5	Educational Development Time (EDT) should be designated on the rota as protected time.
6	The rota should recognise the need to provide clinical leadership opportunities.
7	The rota should recognise the need for doctors approaching specialist registration to meet their senior training needs.

2.5 REGISTERED NURSE STAFFING

Minimum Standards

1	Level 3 patients must have a minimum registered nurse:patient ratio of 1:1 to deliver direct care.
2	Level 2 patients must have a minimum registered nurse:patient ratio of 1:2 to deliver direct care.
3	Each ICU must have an identified intensive care matron/lead nurse, dedicated solely to managing intensive care, who has overall responsibility for the nursing elements of the intensive care service.
4	The matron/lead nurse must hold the same specialist intensive care nurse educational standards as direct care staff providing care to critically ill patients and families.
5	There must be a clinical shift leader, who is not allocated a patient, on duty 24/7 in all ICUs.
6	All clinical shift leaders must have completed or be working towards completion of CC3N Step 4 Competencies and hold a post-registration critical care award.
7	ICUs with more than 10 beds, and each additional 10 beds thereafter, and/or ICUs with large numbers of single rooms, additional infection prevention control requirements or a wide geographical unit footprint, must have at least one additional enhanced critical care nurse who is not allocated a patient.
8	There must be no more than 20% of registered nurses from bank/agency, who are NOT substantively employed by the unit, on any one shift.
9	Each ICU must have dedicated professional nurse advocates (PNAs) within the establishment, who are given designated time to deliver the role.
10	A minimum of 50% of registered intensive care nurses must be in possession of a post-registration critical care award.
11	Each ICU must have a dedicated supernumerary clinical educator responsible for coordinating the education and training of intensive care staff.
12	The ratio of clinical educator must equate to a minimum of 1 WTE per 75 registered nurses and non-registered healthcare support workers (headcount).
13	Clinical educators must be in possession of post-registration Adult Critical Care Award National Competencies for Adult Critical Care Nurses Step 4 and an appropriate post-graduate certificate in education or equivalent.
14	All novice intensive care nursing staff (staff new to intensive care, including internationally educated nurses) must be allocated a period of 12 weeks supernumerary practice to enable achievement of basic specialist competence.
15	In preparation for accessing the post-registration Adult Critical Care Course all new staff must complete the National Critical Care Step 1 Competencies.

Recommendations to provide a quality service	
1	The ratio of clinical educator should equate to a minimum of 1 WTE per 50 registered nurses and non-registered healthcare support workers (headcount).
2	All registered nursing staff supplied by bank/agency should have completed as a minimum Step 1 competencies.
3	All agency/bank staff should be provided with unit orientation.
4	Staff should not be redeployed to the wards from intensive care routinely, but where this is deemed absolutely necessary, best practice guidance needs to be followed.

2.6 REGISTERED NURSE ASSOCIATE STAFFING STANDARDS

Minimum Standards	
1	NARs must work within their scope of practice as defined by the Nursing and Midwifery Council.
2	NARs provide an assistive function and must not be responsible for planning, evaluating or leading care.
3	NARs must not be used to replace RN roles (including registered and unregistered nursing assistive roles) and only support RNs to deliver direct care.
4	No more than 10% of the intensive care nursing workforce must be non-registered Health Care Support staff (including NARs) as a proportion of direct care nursing staff.
5	NAR supervision must be provided by the additional Enhanced Intensive Care RNs not directly allocated to patient care in units with greater than 10 beds; in units with less than 10 beds this will need to be agreed locally.
6	NARs must complete the National Critical Care Nursing Associate Competences.
7	All staff performing assistive nursing roles must receive appropriate training and undergo competence assessment.
8	The supernumerary period for an NAR commencing employment in intensive care must be a minimum of 12 weeks.

2.7 PHARMACY TEAM

Minimum Standards	
1	There must be a designated intensive care pharmacist(s) for every ICU.
2	Core clinical pharmacy services must be delivered to intensive care seven days a week.
3	There must be a minimum 0.14 WTE pharmacist for every intensive care bed.
4	Intensive care pharmacist(s) must be available five days a week.
5	Intensive care pharmacist(s) must attend daily multidisciplinary ward rounds on weekdays (excluding public holidays).
6	The most senior pharmacist(s) within a healthcare organisation who works with critically ill patients on a daily basis must be able to demonstrate advanced level intensive care pharmacist practice.
7	Other clinical pharmacists who provide a service to intensive care areas must have the minimum competencies to allow them to do so.
8	Other clinical pharmacists who provide a service to intensive care must have access to an advanced or consultant level intensive care pharmacist for advice and referrals.
Recommendations to Provide a Quality Service	
1	There should be intensive care pharmacist(s) available seven days a week.
2	Intensive care pharmacists should undergo an independent, recognised process to verify competence level.
3	There should be sufficient patient-facing pharmacy technical staff for medicines management activities (clinical and non-clinical), and other supporting activities.

4	Job plans for senior permanent staff members should be in place to ensure appropriate prioritisation across all pillars of practice.
5	Senior specialist intensive care pharmacist support should be accessible within the healthcare organisation.
6	Where a team of intensive care pharmacists is in place, there should be a structured range of expertise, from foundation to consultant level.
7	Peer-to-peer practitioner visit(s) should occur at least once a year to ensure training issues are identified and to help maintain the competence of small teams and sole workers.
8	There should be sufficient pharmacy assistant staff to support medicines supply, and to support intensive care nursing staff with non-clinical management and supply activities.

2.8 PHYSIOTHERAPISTS

Minimum Standards

1	ICUs must have access to a physiotherapist covering all aspects of intensive care (including respiratory and rehabilitation services, and contributions to the multidisciplinary coordination of care) five days per week.
2	There must be emergency access to 24-hour respiratory physiotherapy.
3	The physiotherapy service in each ICU must have operational policies detailing core standards and a framework for effective management of safety, risk and quality.
4	All ICUs must have a recognised lead physiotherapist with at least an enhanced level of practice accountable for safety, quality, governance, training, and mentorship.
5	A workforce development plan must be in place which encompasses all registered and physiotherapy support staff working within intensive care.
6	Physiotherapy staff must have support to meet the requirements of their role and meet professional and regulatory CPD requirements.
7	Intensive care physiotherapists must utilise the ICS AHP capability framework, to track and guide professional development, working across the four pillars of practice.
8	Physiotherapists must be involved with non-direct patient facing roles within the ICU service delivery including, training and any relevant clinical guideline development, clinical governance and morbidity and mortality meetings.
9	Physiotherapy staff must attend ICU patient care MDT meetings.

Recommendations to Provide a Quality Service

1	There should be a minimum of 0.25 WTE registered physiotherapist per ICU bed.
2	At least 30% of the registered physiotherapy workforce should be operating at enhanced level of practice or higher.
3	Physiotherapy services should provide assessment and intervention for patients requiring rehabilitation seven-days per week.
4	The physiotherapy intervention(s) as part of the patients individualised rehabilitation plan, should be matched to the acuity, dependency and complexity of the patient, considering the patients clinical needs and tolerance to interventions.
5	All organisations should explore the need for physiotherapy roles working at consultant or advanced level of practice.
6	Physiotherapy services, either independently or in conjunction with other nursing and AHP services, should take proactive steps to maximise the utilisation of rehabilitation/therapy support workers and assistant practitioners across the intensive care pathway, utilising apprenticeships, and other training paths to support this.
7	Physiotherapy services, either independently or in conjunction with medical, nursing and other AHP services, should create evidence-informed clinical guidelines and standard operating procedures for common physiotherapy patient needs.
8	The lead physiotherapist, or appropriate deputy, should actively participate in all relevant local, and where appropriate regional, intensive care leadership forums and structures.

9	Physiotherapy services should consider roles dedicated to supporting the training and development of core ICU physiotherapists and those fulfilling emergency out of hours work.

2.9 DIETITIANS

Minimum Standards

1	ICUs must have access to a dietitian five days a week.
2	If the intensive care dietitian is working alone, they must be at an enhanced level.
3	Where more than one dietitian is required, there must be an identifiable lead dietitian at enhanced or above level to ensure an appropriate range of expertise within the team and to have overall responsibility for the service provision.
4	Intensive care dietitian(s) must utilise the ICS AHP capability framework, to track and guide professional development, working within the four pillars of practice.
5	Intensive care dietitian(s) must attend ICU patient care MDT meetings.
6	Intensive care dietitian(s) must have regular communication with the consultant where nutritional goals, risks and plans are discussed.
7	Intensive care dietitian(s) must lead on the development and implementation of any local nutrition support guideline(s) and protocols.
8	Intensive care dietitian(s) must contribute to appropriate strategic meetings and clinical governance activities, including leading regular nutrition-related audits and quality improvement projects.
9	Intensive care dietitian(s) must provide a structured handover to a ward dietitian when patients are discharged from the ICU, considering nutrition-related morbidity as per the NICE Quality Standard.

Recommendations to Provide a Quality Service

1	There should be a minimum of 0.1 WTE dietitian per intensive care bed.
2	Intensive care dietitian(s) should provide ongoing education and training for other healthcare professionals.
3	Intensive care dietitian(s) should consider gaining extended skills such as inserting feeding tubes, using indirect calorimetry to determine energy expenditure and/or non-medical supplementary prescribing.
4	Intensive care dietitian(s) should participate in any nutrition related research activity.
5	Intensive care dietitian(s) should be a member of a national or international professional support group.

2.10 SPEECH & LANGUAGE THERAPISTS

Minimum Standards

1	ICUs must have access to an SLT five days a week.
2	All patients with a tracheostomy must be referred to SLT at the point of sedation hold for assessment of communication and swallowing needs.
3	SLTs must have the competency and capability to assess, manage and treat complex dysphagia and communication impairments, including patients with tracheostomy tubes, in the ICU environment.
4	Where more than one SLT is required, there must be an identifiable lead SLT at enhanced or above level to ensure an appropriate range of expertise within the team and to have overall responsibility for the service provision.
5	SLTs must utilise the ICS AHP capability framework and the Royal College of Speech and Language Therapy (RCSLT) competency documents, to track and guide professional development.
6	FEES must be available for SLTs to use in ICU for the assessment and management of laryngeal dysfunction, secretion management and dysphagia.
7	SLTs must provide communication swallowing and upper airway functional goals for the rehabilitation prescription and medical handover at step-down and throughout recovery.
8	SLTs must attend ICU patient care MDT meetings.

9	SLTs must contribute to ICU ward rounds, tracheostomy teams, follow-up clinics, training, and any relevant clinical guideline development, clinical governance and morbidity and mortality meetings.
10	SLTs must contribute to tracheostomy and/or ventilation weaning plans for those patients who have communication, swallowing and/or upper airway functional impairment.

Recommendations to Provide a Quality Service

1	There should be a minimum of 0.1 WTE SLT per ICU bed.
2	SLTs should advise staff, patients and patients' family/friends on communication strategies and aids to facilitate effective communication.
3	SLTs should provide education to the team on ICU specific manifestations of communication disorder and dysphagia and the impact these have on weaning.
4	SLTs should participate in any relevant collaborative audit or research activity.
5	The lead SLT, or appropriate deputy, should actively participate in all relevant local regional and national critical care networks and forums.

2.11 OCCUPATIONAL THERAPISTS

Minimum Standards

1	ICUs must have access to an OT five days a week.
2	All OTs working in ICU must utilise the AHP Critical Care Capability Framework, to track and guide professional development, working within the four pillars of practice.
3	There must be a designated lead OT working at an enhanced level (or above), accountable for ICU service provision, workforce and professional development.
4	OTs must complete a needs-based assessment using holistic measures of health and disability including activities of daily living in ICU.
5	OTs must be able to assess and contribute to non- pharmacological treatment options for patients who present with delirium in line with the P.A.D.I.S. guidelines (pain, agitation, delirium, immobility and sleep).
6	OTs must have time in their job plan to attend ICU patient care MDT meetings.
7	OTs must be involved with non-direct patient facing roles within the ICU service delivery including training, relevant clinical guideline development, clinical governance and morbidity and mortality meetings.

Recommendations to Provide a Quality Service

1	There should be a minimum of 0.15 WTE OT per ICU bed.
2	The OT service should aim to deliver a seven-day service for intensive care patients.
3	OTs should be involved in post intensive care unit recovery services.
4	The lead OT should be responsible for supporting learning opportunities, training and clinical supervision for junior staff providing OT services in intensive care.
5	OTs should be involved in research and development.
6	OTs should be linked with local and national critical care networks.

2.12 PRACTITIONER PSYCHOLOGISTS

Minimum Standards

1	ICUs must have access to practitioner psychologists.
2	Where integrated practitioner psychologists are present, they must be embedded within intensive care multidisciplinary teams to address the psychological health needs of patients and their families/loved ones.
3	Where integrated practitioner psychologists are present the most senior practitioner psychologist must be part of the intensive care leadership team, to advise on systemic issues influencing staff wellbeing.
4	All patients in ICU must be screened for psychological distress.

5	Patients with psychological distress in ICU must be triaged to receive psychological interventions as appropriate.

Recommendations to Provide a Quality Service

1	ICUs should have access to practitioner psychologists five days a week.
2	There should be a minimum of 0.1 WTE practitioner psychologist per intensive care bed.
3	Practitioner psychologists should be integrated into the ICU.
4	A small to medium sized unit (up to 20 beds) should be led by a grade 8b practitioner psychologist.
5	For larger units (more than 20 beds), or those with multiple sites, an 8c consultant psychologist should lead, with support from qualified psychologists at lower bands (7-8b).
6	Patients should receive assessments for psychological difficulties throughout the intensive care pathway as specified by NICE QS 1585 and ideally delivered or supervised by qualified practitioner psychologists.
7	Practitioner psychologists should provide evidence-based interventions for patients who have been assessed as at-risk of psychological morbidity (see background for more detail).
8	Practitioner psychologists should also work indirectly, by offering advice and consultation to other ICU staff about psychological issues that arise in these colleagues' clinical work.
9	Practitioner psychologists should offer short term family support with a view to supporting decision making and signposting families to appropriate psychological services in the community.
10	Practitioner psychologists should be involved in education, research and QI projects to improve psychological understanding and care in the ICU.
11	ICU practitioner psychologists should contribute to post ICU rehabilitation and recovery services.

2.13 HEALTHCARE SCIENTISTS SPECIALISING IN INTENSIVE CARE

Minimum Standards

1	Critical care scientists must comply with the professional standards of behaviour and practice set out in Good Scientific Practice (GSP).
2	Critical care scientists responsible for management of medical devices and point of care diagnostic services must comply with the standards set by the Medicines and Healthcare Products Regulatory Agency (MHRA) and the International Organisation for Standardisation (ISO) standard (22870:2016).
3	Critical care scientists voluntarily registered with the Health and Care Professions Council (HCPC) must meet the Standard of Proficiency and comply with the Standards of Conduct, Performance and Ethics.
4	ICUs receiving trainee healthcare scientists for training in intensive care must comply with the requirements for training set for them by the National School of Healthcare Scientist (NSHCS).

Recommendations to Provide a Quality Service

1	Critical care scientists should successfully complete an approved training programme, either via accredited specialist training or as part of the Scientist Training Program (STP) commissioned by the National School of Healthcare Science (NSHCS).
2	Critical care scientists should be registered with the HCPC.
3	Critical care scientists should work collaboratively to be a dynamic member of the multidisciplinary team.
4	Critical care scientists should provide advice to medical, nursing, and wider multidisciplinary team about the safe and effective use of medical devices used within the intensive care environment.
5	Critical care scientists should develop and support research activities.
6	Critical care scientists should provide effective management and support for medical devices, including advising on optimal clinical settings and troubleshooting, resulting in focused, efficient, and high-quality care.
7	Critical care scientists should contribute to the educational needs of the multidisciplinary team.
8	Critical care scientists should demonstrate flexibility and adaptability to work across diverse pathways of patient care and clinical services that are both routine and highly specialised.

9	Critical care scientists should work safely and effectively within their scope of practice and ensure they do not practise in areas where they are not proficient.
10	As part of the multidisciplinary team, critical care scientists should contribute to the strategic direction, planning and delivery of intensive care services.
11	Critical care scientists should engage with the Society of Critical Care Technologies (SCCT) as their professional body to work in collaboration with the Academy for Healthcare Science and the NSHCS.

2.14 SUPPORT STAFF

Minimum Standards

1	All support staff must have clearly identifiable roles with specific competencies.
2	All support staff must have a period of induction and supernumerary status.
3	All support staff must be appropriately trained, competent, and familiar with the use of equipment.
4	All support staff must be included within the intensive care team and be updated on key unit issues and developments.
5	Support staff roles must be clearly identifiable to colleagues, patients, and visitors to the department, either by uniform and/or name badges.
6	Intensive care areas must develop healthcare support worker roles to assist registered nurses in delivering direct patient care and in maintaining patient safety.
7	Healthcare support workers must complete the Care Certificate, the CC3N HCSW competencies and adhere to the Code of Conduct for healthcare support workers.
8	Administrative roles must be developed to ensure all clinical staff are free to give direct patient care and supported with essential data collection.
9	Each intensive care area must have sufficient staff responsible for the cleanliness of the environment.

Recommendations to Provide a Quality Service

1	All staff should be encouraged to attend further training and/or education to support their development.
2	Each intensive care area should have healthcare support workers 24/7 to assist nursing staff in delivery of direct patient care.
3	Each intensive care area should have ward clerk/receptionist cover seven days per week.
4	Each intensive care area should have a dedicated housekeeper/cleaner seven days per week.
5	Training provided to the dedicated team should meet recognised best practice standards and be adaptable to the complex and varied demands of the ICU environment.
6	The core housekeeper/cleaner team should be comprised of a minimum of two members for every 12 ICU beds over a 12-hour period.
7	Each intensive care area should have a data clerk or dedicated time allotted to a suitable member of staff for data entry to a nationally recognised audit casemix programme and responsibility for the validation of these data.
8	Each intensive care area should have access to a designated suitable TRiM (Trauma Risk Management) practitioner to support when required.
9	Each intensive care area should have a designated medical equipment technician allocated to support overseeing and maintenance/contracts and sourcing/procurement of specialist devices and safety of equipment.

2.15 INDUCTION, RETURN TO WORK AND EXIT

Minimum Standards

1	All new members of staff must have an appropriate-to-role induction led by relevant members of staff.
2	Special consideration and adaptation of the induction programme must be given to those members of staff new to intensive care.

3	Special consideration and adaptation of the induction programme must be given to those members of staff from overseas for whom the NHS is a new environment, including a supernumerary period where needed.
4	All intensive care nursing staff new to intensive care, including nurses from overseas, must be allocated a minimum period of 12 weeks to enable achievement of basic specialist competencies.
5	Where direct care is augmented using assistive and supportive staff (including registered and unregistered nursing roles), appropriate induction must be provided by suitably trained intensive care nursing staff using national competencies.
6	There must be a policy in place to support staff returning to work after a period of absence.
7	Staff returning after a prolonged period of absence, must have a personalised plan for their supported return.
8	A preceptorship period must be considered for those returning to intensive care after a period of time away from intensive care.
9	All staff when leaving intensive care must have the opportunity to feedback on their experience of working in the ICU including opportunities for learning and development.
Recommendations to Provide a Quality Service	
1	Feedback from participants in the induction process should be gathered to inform future inductions.
2	Feedback regarding the process from those returning to work should be gathered to inform future processes.
3	A summary of trends gathered from the exit information should be reported to the ICU and hospital senior leadership.

2.16 PROFESSIONAL DEVELOPMENT, TRAINING AND EDUCATION

MULTIDISCIPLINARY TEAM

Minimum Standards	
1	Members of the multidisciplinary team must have support to meet professional and regulatory CPD requirements.
2	AHPs must utilise the ICS AHP Capability Framework, to track and guide professional development, working within the four pillars of practice.
Recommendations to Provide a Quality Service	
1	All members of the multidisciplinary team should be considered, where appropriate, eligible for intensive care educator roles.
2	Intensive care educators should be allocated sufficient time in their job plan to fulfil their role.
3	All members of the multidisciplinary team should be offered the educational opportunities they require to develop capabilities across a range of learning experiences to meet the defined learning outcomes for their continuing professional development.
4	Study leave should be provided for all members of the multidisciplinary team for intensive care-related courses and conferences.
5	All members of the multidisciplinary team should be supported to attend ICU Morbidity and Mortality, governance and quality improvement meetings.
6	The medically led teaching programme, where appropriate, should be open to all members of the multidisciplinary team.

NURSING

Minimum Standards	
1	The ratio of clinical educator must equate to a minimum of 1 WTE per 75 registered nurses and non-registered healthcare support workers (headcount).
2	Clinical educators must be in possession of post-registration Adult Critical Care Award, National Competencies for Adult Critical Care Nurses Step 4 and an appropriate post-graduate certificate in education or equivalent.

3	A minimum of 50% of registered intensive care nurses must be in possession of a post-registration critical care award.
4	All clinical shift leaders must be working towards completion of CC3N Step 4 Competencies and hold a post-registration critical care award.
5	All registered nurses working in intensive care must be working towards completing the Steps National Competency Framework for Adult Nurses in Critical Care (Step 1,2 and 3).
Recommendations to Provide a Quality Service	
1	The ratio of clinical educator should equate to a minimum of 1 WTE per 50 registered nurses and non-registered healthcare support workers (headcount).
2	Critical care educators should have a job plan that ensures they have allocated time for all aspects of the role including preparation of educational resources.
3	Critical care educators role and time should be always protected unless in exceptional circumstances.
4	Nurse education programmes should follow the National Standards for Critical Care Education and include both clinical competence and assessment.
5	Specialist step competencies should be completed whenever relevant to the casemix of the unit.
OUTREACH	
Recommendations to provide a quality service	
1	Critical care outreach staff, whether they sit within or outside intensive care directorates, should possess critical care competency (enhanced, advanced, consultant), and achieve the competency level set out as part of their role description and in line with the Critical Care Outreach Practitioner (CCOP) Framework.
MEDICAL DOCTORS	
Minimum Standards	
1	All non-consultant doctors must have a designated educational supervisor or SAS tutor.
2	All doctors not in formal training must have an appraiser for revalidation.
3	All doctors must have an agreed Personal Development Plan (PDP) relevant and realistic to their developmental needs.
4	Doctors in specialty training on the ICU must be provided with the opportunity to fulfil the relevant competences and requirements of their specialty curriculum.
5	All intensive care training units must have a FICM-appointed Faculty Tutor.
6	Faculty Tutors must be given the same support and time to perform their role in terms of SPAs, as other College/ Faculty Tutors from other specialties.
7	Educational supervisors must have job planning which allows 0.25 PA per ICU doctor in training.*
8	All senior doctors responsible for the educational supervision of doctors in training must be developed, supported and appraised annually using the criteria recognised by the GMC for this role.
Recommendations to Provide a Quality Service	
1	Educational/clinical supervisors, SAS tutors and appraisers should be allocated sufficient time in their job plan to fulfil their role.*
2	All doctors should be given the time and opportunity to achieve the objectives within the personal development plan as agreed with their educational, SAS tutor or appraiser.
3	Doctors should be able to access the resources (including time to learn) that will support the revalidation process.
4	Educational Development Time (EDT) should be designated on the rota as protected time.
5	There should be a regular medical teaching for non-consultant ICU doctors and protected time to attend.
6	ICU doctors should be supported to attend ICU morbidity and mortality, governance and quality improvement meetings.

7	The development, education and training of all doctors on the ICU should be regularly reviewed through a local quality assurance process.
8	Faculty Tutors should consider the learning needs of all non-consultant medical doctors and ACCPs, ensuring that learning opportunities are allocated to the most appropriate members of the team during each shift, with priority given to intensivists in training (IiT) and those on the ICM portfolio pathway.

*There is no single nationally mandated PA allocation for those with roles in supervising non-consultant medical doctors. Final decision is as per locally agreed job planning. This recommendation seeks to promote quality in professional development, education and training.

ACCPS

Minimum Standards

1	ICUs who employ or train ACCPs must have an ICM consultant lead for ACCPs.
2	Continuing professional development (CPD/appraisal) for ACCPs must be carried out on an annual basis, in accordance with FICM CPD/appraisal guidance, which meets the revalidation requirements of their base professional regulator.
3	All ACCPs must have a PDP relevant and realistic to their developmental needs which has been agreed upon by their ICM consultant and ACCP clinical lead.

Recommendations to Provide a Quality Service

1	There should be sufficient job planned ICM consultant time to allow 0.25 PA per ACCP in training and 0.125 PA per trained ACCP.
2	ACCP clinical leads should be allocated sufficient time in their job plan to fulfil their role.
3	All ACCPs should be given the time and opportunity to achieve the objectives within their PDP.
4	There should be a regular ACCP teaching and protected time to attend.
5	ACCPs should be supported to attend ICU morbidity and mortality, governance and quality improvement meetings.
6	The development, education and training of ACCPs should be regularly reviewed through a local quality assurance process.

2.17 STAFF WELLBEING

Minimum Standards

1	ICUs must have a staff health and wellbeing policy to support staff experience, engagement and retention (this could be the trust/hospital policy with specific ICU additions).
2	ICUs must provide adequate environmental conditions, including rest and break facilities, conducive to physically safe and healthy working.
3	Each staff role must be designed to meet the work demands with the resources required to fulfil the job, including rotas being consistent with Health and Safety Executive requirements for adequate rest.
4	Staff must be provided with formal and informal meeting spaces and systems to enable discussion and management of the emotional impact of work.
5	ICUs must monitor health and wellbeing at an individual and team level.
6	There must be clear and timely access to occupational health assessment and associated required professional physical and psychological interventions to support time from work, reasonable adjustments to work, and interventions to restore health and wellbeing as appropriate.

Recommendations to Provide a Quality Service

1	There should be adequate staffing resources consistent with GPICS V3.
2	Staff should have access to job planning, personal development planning, annual appraisal and equity of access to educational opportunities.
3	Leaders should be appropriately recruited, and have access to appropriate personal development, including the facility for mentoring and/or coaching services to support them in their role.

4	ICUs should promote a supportive work environment to foster healthy working relationships, psychological safety and positive culture.
5	ICUs should provide support for staff involved in adverse events.
6	There should be timely and meaningful consultations on changes and initiatives that regularly keep the staff informed.
7	ICUs should provide frequent opportunities for shared learning, clinical communication, and reflection.
8	Staff of all grades and professions should be offered opportunities to contribute towards wider quality, safety and innovation projects.

2.18 EQUITY, DIVERSITY AND INCLUSION

Minimum Standards

1	ICUs must have a policy for recognising, reporting, and addressing unacceptable behaviours within the department, including bullying, harassment, and discrimination.
2	ICUs must ensure that the determinants of workplace equity, including role allocation, career progression, recruitment, rostering and leave allocation are subject to transparent processes, which have inclusivity and equity at their core.

Recommendations to Provide a Quality Service

1	ICUs should appoint a lead for equity, diversity, and inclusion (EDI Lead).
2	ICUs should develop a locally tailored EDI vision statement that reflects the context and needs of their intensive care services.
3	ICUs should report EDI related data through established local governance structures with a focus on role allocation, promotion, and access to leadership opportunities.
4	All staff members should receive training on equity, diversity, and inclusion that is relevant, meaningful, and easily accessible.
5	All staff members should have equitable access to educational resources, funding, and opportunities for professional development.
6	ICUs should assign dedicated mentors for specific groups known to experience barriers to career progression, such as international graduates and Locally Employed Doctors (LEDs) to ensure that they receive tailored support and development opportunities.
7	ICUs should recognise and support the individual needs of staff.
8	ICUs should have policies and provide support for staff members with caring responsibilities, such as parental leave and flexible working arrangements.
9	ICUs should have a compassionate and individualised return-to-work policy for staff members returning from extended leave due to reasons such as illness, maternity/paternity/parental leave, or caring responsibilities.
10	ICUs should offer flexibility in rota and job planning to accommodate the diverse and evolving needs of staff.
11	ICUs should promote an open and supportive environment for discussing reproductive health, underpinned by clear policies and awareness of available support and resources.
12	ICUs should ensure that procurement processes prioritise medical devices that function to the same standard across the diverse population they serve.
13	ICUs should provide training in culturally competent care, with emphasis on recognising how clinical conditions may present differently among patients of different ethnic backgrounds, to reduce disparities in healthcare outcomes.
14	ICUs should support individualised care that actively minimises the risk of diagnostic overshadowing or bias towards patients with chronic health conditions, disabilities, or other protected characteristics.
15	ICUs should establish regular forums for senior decision-makers to reflect on and discuss admission decisions.

3.1 STANDARDISED CARE OF THE CRITICALLY ILL PATIENT

Minimum Standards

1	Patients must be assessed daily for risk of thromboembolic disease and receive appropriate prophylaxis.
2	Patients undergoing controlled mechanical ventilation who have Acute Respiratory Distress Syndrome (ARDS) must receive a tidal volume of less than or equal to 6 ml/kg PBW.
3	Ventilated patients must have respiratory function evaluated daily and undergo spontaneous breathing trials where appropriate.
4	Sedation must be individualised to patient needs and the appropriateness of a sedation hold considered daily.
5	All patients must be assessed regularly for evidence of pain, with analgesia optimised to minimise sedation requirements.
6	All patients must be screened daily for evidence of delirium using a validated method and action taken to reduce risk/manage delirium as needed.
7	The need for continued indwelling catheters (e.g. intravascular or urinary) must be considered daily.
8	Indwelling catheters must be assessed daily for evidence of infection, ongoing need and suitability for removal.
9	Monitoring of invasively ventilated patients must include continuous waveform capnography.
10	Care bundles must be in place for Ventilator Associated Pneumonia (VAP) prevention, Central Venous Catheter (CVC) insertion and maintenance, and Peripheral Venous Cannula (PVC) insertion and maintenance.

Recommendations to Provide a Quality Service

1	Patients' height and weight should be recorded on admission to ICU or as early as possible if not feasible.
2	For patients without ARDS, a tidal volume of 4-8 mls/kg PBW and a peak/plateau pressure (depending on mode) of below 30 cmH20 should be targeted.
3	A ventilated patient care bundle should be in place with appropriate mechanisms for ensuring adherence.
4	Unless clinically contra-indicated, ventilated patients should be nursed in a semi-recumbent position at 30 to 45 degrees.
5	Where there is no contraindication, enteral nutrition (EN) should be initiated within 48 hours after admission to the ICU.
6	When EN is not feasible or insufficient, parenteral nutrition should be considered in patients with (or at high risk of) malnutrition, which maybe a combination of cachexia (disease related) and malnutrition (inadequate consumption of nutrients).
7	Validated scoring systems, where available, should be applied to optimise analgesia and sedation according to defined targets.
8	Noise levels and patient interventions should be minimised overnight to facilitate natural sleep.
9	A transfusion threshold of 70g/L should be adopted in general for haemodynamically stable intensive care patients in the absence of indication for a higher haemoglobin target.
10	Viscoelastic tests, such as thrombo-elastography or ROTEM, should be available to guide the use of blood products.
11	Drug infusion concentrations should be standardised in line with Intensive Care Society's Standard Medication Concentrations for Continuous Infusions in Adult Critical Care.

3.2 ADMISSION, DISCHARGE AND HANDOVER

Minimum Standards

1	The time and decision to admit to the ICU must be clearly documented in the patient record.
2	The decision and management plan for any admission must be discussed with the duty consultant responsible for the ICUand the nurse in charge, as soon as possible.

3	Unplanned admissions to the ICU must occur within four hours of making the decision to admit and the completion of the essential resuscitation and imaging.
4	There must be clear documentation on the decision process for those who are referred and not accepted for intensive care admission and the in-patient treating team informed of the decision.
5	Patients must be reviewed, in person, by a consultant responsible for the ICU as urgently as the clinical state dictates, and always within 14 hours of admission to intensive care.
6	Patients on intensive care must have a clear and documented treatment escalation plan.
7	Discharge from intensive care to a general ward must occur only between 0700hrs and 2159hrs, except for reasons of surge.
8	Out of hours discharges must have an incident report completed.
9	The nurse in charge (or area leader in larger units) must be present in person for the ward round to ensure appropriate multidisciplinary discharge planning.
10	There must be a standardised handover procedure of patient care and responsibility at shift change for medical, nursing and AHP staff.
11	There must be a standardised handover procedure for medical, nursing, and all health professionals involved in a patient's care for patients discharged from ICU.
12	Handover for patients discharged from ICU must include their structured rehabilitation programme.
13	An intensive care consultant must undertake ward rounds twice a day, one of which will be face to face, seven days a week. (see Chapter 2.1 Consultant Staffing)
Recommendations to Provide a Quality Service	
1	Unplanned admissions should be seen by an intensive care doctor or ACCP within one hour of admission and first line management commenced, with clear documentation of discussion with the duty consultant in intensive care.
2	Patients considered 'high risk' (defined as where the risk of mortality is greater than 10%, or where a patient is unstable and not responding to treatment as expected), should have consultant involvement within one hour.
3	ICUs should monitor and review the causes for unplanned readmissions, to focus improvement efforts on factors leading to readmission.
4	Discharge from intensive care to a general ward should occur within four hours of the decision.
5	Patients requiring repatriation to their local hospital to continue care should be transferred within 48 hours of acceptance by the receiving hospital. (See Chapter 3.14 Transfer)
6	All patients discharged from intensive care should be reviewed by intensive care/outreach services within the first 24-48 hours of leaving the unit.
7	Patients discharged from intensive care should have access to an intensive care follow-up service.
8	ICUs should have a dedicated intensive care outreach team, separate to those with responsibility for the day-to-day running of the unit, able to respond promptly to concerns raised by the in-patient ward teams, support admission to ICU and review intensive care ward discharges.

3.3 INVOLVING, SUPPORTING AND RESPECTING PATIENTS

Minimum Standards	
1	There must be a documented formal assessment of each patient's communication needs and any adaptations required, which is updated through the ICU stay.
2	Patient preferences, values and beliefs which may impact on their care must be recorded and easily accessible to the healthcare team.
3	Patients must be regularly assessed for pain, thirst, dyspnoea and delirium, using validated tools if available, and the results recorded.
4	All ICUs must have a guideline for managing patient pain, thirst, dyspnoea and delirium.
5	All ICUs must have a guideline for, and practise, sleep promoting activities using non-pharmaceutical interventions.

6	Delirium information and explanation must be available for patients and signposted when appropriate.
7	Patients must be provided with or signposted to information and support after their ICU experience.
8	All ICUs must have a designated safeguarding lead and policies on safeguarding vulnerable patients.
Recommendations to Provide a Quality Service	
1	Staff should receive specific training about the patient experience in the ICU, particularly for those with a prolonged ICU stay, and how the experience can be humanised.
2	The ICU team and patient's family and friends should be invited and supported to complete a patient diary and/or a timeline of ICU events to support patients' post ICU recovery
3	For patients who are expected to remain on the ICU for more than a few days, a 'this is me' board or equivalent should be considered.
4	The ICU should have a formal mechanism to receive patients' feedback after discharge.
5	Patient feedback should be shared with the ICU.

3.4 INVOLVING AND CARING FOR PATIENTS' FAMILY AND FRIENDS

Minimum Standards	
1	Patients' family and friends must be able to visit every day, either in person or virtually.
2	The ICU must have rest areas and private spaces for discussions with family and friends visiting the patient.
3	Information regarding the ICU environment, staff, routines, available services and what to expect in ICU must be available and readily accessible for patients' family and friends.
4	When not physically present on the ICU, patients' nominated family and friends must be able to receive appropriate updates regarding the current condition of the patient.
5	If patients lack capacity, have communication difficulties or are otherwise unable to advocate for their preferences, those who are close to the patient or have an interest in their welfare must be involved in any important clinical decisions, in accordance with relevant legislation.
6	Communication with family and friends regarding the patient must be clearly documented.
Recommendations to Provide a Quality Service	
1	ICUs should have a formal mechanism to receive feedback from patients' family and friends.
2	ICUs should identify staff to lead in supporting family care and developing this service.
3	ICUs should provide staff training on effective support and communication for patients' family and friends which incorporates any formal and informal feedback.
4	Family and friends should be signposted to accessible information regarding common ICU conditions.
5	Appropriate ways for family and friends to support a patient's wellbeing and psychological care should be defined locally and clearly signposted.
6	Technology to allow family and friends to communicate virtually with the patient or the ICU staff should be available.
7	The ICU team and patients' family and friends should be invited and supported to complete a patient diary and/or a timeline of ICU events to support patients' post ICU recovery.
8	Information regarding additional support for patients' family and friends should be available.
9	Bereavement support should be provided to the family and friends of those who die on ICUs.
10	Nominated family and friends should be offered an opportunity to discuss the care of a patient who dies on the ICU with a member of the clinical team.

3.5 AIRWAY MANAGEMENT

Minimum Standards

1	ICUs must have clear processes for summoning advanced airway practitioner support, including personnel able to perform and assist an awake tracheal intubation and ENT support.
2	ICUs must have immediate access to the appropriate airway devices which include the equipment necessary to manage a difficult airway.
3	Each patient undergoing an advanced airway intervention must have a trained airway assistant.
4	Key airway management records must be regularly accessible to the clinical team.
5	ICUs must have regularly checked, audited and restocked airway trolley, comprising Difficult Airway Society (DAS) guideline Plan A-D drawers.
6	When managing an airway, ICUs must have access to appropriate monitoring in accordance with the DAS-ICS-FICM-RCoA guideline on intubation in the critically ill patient.
7	All patients ventilated via an artificial airway must be appropriately monitored in accordance with the DAS-ICS-FICM-RCoA guideline on intubation in the critically ill patient.
8	ICUs must have immediate access to chest radiography and point of care ultrasound (POCUS) to assess the airway and exclude complications of airway management.
9	ICUs must have a named medical doctor as lead for airway management.
10	ICUs must have written guidance for airway management in ICU.
11	Standardised bed head signage must be displayed for patients with laryngectomies, tracheostomies and known difficult airways.
12	ICUs must ensure that patients with complex, or 'at risk', airways are identified at handover and that a plan for emergency reintubation is made.

Recommendations to Provide a Quality Service

1	Safe airway management checklists should be available and used routinely
2	ICUs should regularly undertake audits of airway practice and complications.
3	ICU procurement should be made in tandem with emergency and operating departments to ensure consistency of airway devices and approach.
4	ICUs should have a named individual as AHP or nursing airway lead.
5	ICUs should incorporate human factors and sim-based training with airway teaching.
6	ICUs should have written guidance for securing an artificial airway device, suctioning and humidification.
7	ICUs should ensure appropriate de-briefing after complications of airway management.

3.6 RESPIRATORY SUPPORT

Minimum Standards

1	ICUs must have access to sufficient modern invasive and non-invasive ventilators, continuous positive airway pressure and high flow nasal oxygen devices.
2	Pulse oximetry, waveform capnography, ECG, blood pressure monitoring, ventilator alarms (where relevant) and point-of-care arterial blood gas analysis must be used for all patients receiving invasive respiratory support.
3	ICUs must have evidence-based guidelines for the management of acute respiratory failure, including Acute Respiratory Distress Syndrome (ARDS).
4	ICUs must have an evidence-based guideline for the prevention of ventilator associated pneumonia.
5	ICUs must have an evidence-based guideline for ventilation weaning, which includes sedation use.
6	ICUs must have an evidence-based guideline for referral for Extra-Corporeal Membrane Oxygenation.
7	Equipment and standard operating procedures, including checklists, must be in place for any high-risk procedure.

8	Units must have protocols in place to manage oxygen flow at times of peak demand, and to ensure safe use of oxygen cylinders where there is no access to pipeline supply.

Recommendations to Provide a Quality Service

1	Tidal volume (ml/kg predicated body weight), plateau airway pressures and cumulative fluid balance should be monitored and recorded daily in all patients with acute respiratory failure.
2	ICUs should audit adherence to guidelines, standard operating procedures and checklists relating to the management of acute respiratory failure.
3	ICUs should monitor ventilator associated pneumonia rates.
4	Non-invasive respiratory support should be considered for all patients with respiratory failure that are not responding to standard oxygen therapy, although used with caution in more severe ARDS.

3.7 CARDIOVASCULAR SUPPORT

Minimum Standards

1	ICUs must be able to manage patients requiring advanced cardiovascular support (Level 2 and 3 care) which would include the use of invasive arterial blood pressure and central venous pressure monitoring and inopressors.
2	Patients admitted to ICUs with potentially reversible cardiogenic shock or who are candidates for transplantation must be discussed early with cardiogenic shock centres capable of providing mechanical cardiovascular support (MCS) or regional advanced heart failure centres.

Recommendations to Provide a Quality Service

1	Immediate coronary angiography and PCI of the infarct-related artery (if indicated) should be considered in critically unwell patients with complications of Acute Coronary Syndrome (ACS).
2	In cases of mechanical complications of ACS or acute valvular pathology resulting in cardiogenic shock, Heart Team discussion should occur to consider emergency surgical or catheter-based repair.
3	All ICUs should have the capability to either non-invasively or invasively assess cardiac output.
4	All patients with suspected acute heart failure or cardiogenic shock should have a focused echocardiogram within 24 hours and access to formal echocardiography.
5	Patients admitted to ICUs with acute heart failure should have access to the local heart failure multidisciplinary team.
6	Cardiogenic shock (CS) centres should have 24/7 access to the range of cardiology specialties, MCS and the ability to perform invasive hemodynamic monitoring and imaging.
7	CS networks should be established to include CS centres and regional advanced heart failure centres.
8	Guidelines and pathways should exist within networks for the referral and transfer of patients to CS centres or regional advanced heart failure centres, and for repatriation of patients back to their local intensive care service.
9	ICUs should adopt the Society for Cardiovascular Angiography and Interventions (SCAI) staging as the standardised descriptor of cardiogenic shock to facilitate triage, communication and expediency of discussion with CS centres and regional advanced heart failure centres.
10	A consultant intensivist should have the opportunity to input into multidisciplinary cardiology discussions when planning both elective and emergency procedural treatment for intensive care patients and those at high risk of requiring intensive care support post procedure, including those patients being transferred in on other established cardiac referral pathways.
11	CS networks should work with regional transfer services to ensure they develop the requisite skills to transfer the sickest cardiology patients.

3.8 RENAL SUPPORT

Minimum Standards

1	ICUs must have the necessary facilities and expertise to provide acute RRT for patients with AKI on a 24/7 basis.
2	Patients receiving acute RRT must be cared for by a multidisciplinary team, trained and experienced in delivering and monitoring RRT.

3	Patients receiving acute RRT, where the cause of AKI is unclear or where RRT will be needed on intensive care discharge, must be discussed with the local renal team.
4	The dose of RRT must be prescribed at the beginning of the RRT session, reviewed daily and tailored to the needs of the patient.
5	There must be close collaboration with an intensive care pharmacist with experience in AKI and the effects of RRT.
6	When discharged from intensive care, the accepting team and GP must be informed that the patient had received RRT for AKI whilst in intensive care so that appropriate follow-up can be arranged.
Recommendations to Provide a Quality Service	
1	The decision to initiate RRT should be based on the condition and prognosis of the patient as a whole, and not on isolated urea or creatinine values.
2	Where life-threatening complications of AKI occur and are not responding to medical management, RRT should be started emergently unless a decision has been made not to escalate therapy.
3	There should be close liaison with the regional renal service regarding transfer and vascular access for patients with end-stage renal failure, who are not in a renal unit or dialysis centre and require urgent RRT in ICU.
4	Patients with end-stage renal failure who are not in a renal unit or dialysis centre and require urgent RRT should be considered for intensive care admission.
5	The choice of therapy should be based on patient status, expertise of the clinical staff, and the available technique(s).
6	The decision to use anticoagulation to maintain circuit patency and the choice of anticoagulant should be based on the potential risks and benefits in an individual patient, the expertise of the clinical team, and the options available.

3.9 GASTROINTESTINAL SUPPORT AND NUTRITION

Minimum Standards	
1	Nutritional status and risk must be assessed and documented on ICU admission.
2	Malnutrition risks increasing mortality, morbidity and length of stay, and must be sought and assessed in all patients staying in ICU >48 hours.
3	The type and position of nasogastric tubes (NGTs) used for enteral nutrition (EN), hydration and/or drug administration, must comply with NHS England guidelines and be no larger than 14 French gauge.
4	A range of EN products must be available to meet the service needs.
5	There must be access to a range of PN bags which include vitamins, trace elements and minerals, to meet the service needs.
6	A nutrition support guideline must be available to promote nutrition delivery, and to advise on managing EN intolerance and when to comment parenteral nutrition (PN).
7	Guidance must be in place to identify and allow safe initiation of nutrition in those at risk of refeeding syndrome.
Recommendations To Provide A Quality Service	
1	Nutritional intake targets should be compared daily with actual intake received.
2	After initial protocolised feeding, individualised nutritional intake plans should be initiated to address nutritional deficits, avoid refeeding syndrome, and correct micronutrient deficiencies.
3	An individualised obesity management plan should be made to avoid overfeeding and address any comorbidities.
4	An intensive care dietitian or appropriately trained clinician should assess energy, protein, and micronutrient targets weekly, with adjustments for patients with a BMI > 30 kg/m².
5	The non-nutrient energy from medications and fluids should be accounted for to avoid overfeeding.
6	Nasal bridles should be provided for securing NGTs in agitated patients, with adherence to local guidelines for their use and aftercare being ensured.

7	There should be access to postpyloric feeding tube placement for patients where gastric feeding intolerance is not solved with prokinetic agents.
8	Bowel management should be assessed daily in all patients and managed according to local policy guidelines.
9	EN should be continued in patients in prone position or supported with extracorporeal membrane oxygenation.
10	EN should be continued up until extubation, avoiding prolonged fasting, and continued post-extubation until the patient is able to meet nutritional needs orally.
11	Where risk of an unsafe swallow function exists an appropriately training individual should assess swallow function with the goal to commence early oral intake utilising therapeutic interventions as required.

3.10 LIVER SUPPORT

Minimum Standards

1	Contact with a liver transplant centre must be made early, following admission of any patient with ALF to an ICU.
2	ICUs managing liver failure and liver trauma must have access to a 24/7 interventional radiology service and/or be part of a network that can provide rapid access to such provision.
3	ICUs managing liver failure must have 24-hour access to both diagnostic and therapeutic upper GI endoscopy services and/or be part of a network that can provide rapid access to such provision.
4	ICUs managing liver failure must have an experienced intensive care pharmacist and dietitian.

Recommendations to Provide a Quality Service

1	ICUs managing liver failure should have a multidisciplinary team of intensivists and hepatologists, and access to input from other relevant specialties.
2	Patients with liver failure, plus any other organ dysfunction, should be considered for admission to intensive care.
3	Patients with non-ALF liver failure should be discussed early with the regional liver centre in consultation with the local hepatology service, if there is any diagnostic or management uncertainty.
4	Patients with ACLF should be discussed early with regional centres, as guided by consultation with the local hepatology service.
5	ICUs admitting patients with variceal bleeding should have agreed pathways to regional centres providing trans-jugular intrahepatic portosystemic shunt (TIPS) for patients with bleeding varices, ensuring early and timely access to such interventions.
6	Viscoelastic tests, such as thrombo-elastography or ROTEM, should be available to guide the use of blood products.
7	Strategies to prevent, monitor and manage intracranial hypertension (ICH) should be available in centres managing patients with ALF.

3.11 NEUROLOGICAL SUPPORT

Minimum Standards

1	Treatments, including transfer for specialist neurological interventions, must be in line as far as possible with individual preferences, including consideration of Advance Care Plans or Anticipatory Care Plans (Scotland) if applicable.
2	Local guidance for the management of patients who remain unconscious following cardiac arrest must be available and in accordance with national and international consensus.
3	Patients admitted to intensive care with intracerebral haemorrhage must be discussed with neurosurgical or stroke care specialists for consideration of, and transfer for appropriate specialist interventions.
4	Adults with middle cerebral artery infarction admitted to intensive care, meeting the criteria described in NICE NG128 must be discussed with a specialist centre for consideration of decompressive craniectomy within 48 hours of symptom onset.
5	Diagnosis of death using neurological criteria must be conducted as per the Academy of Medical Royal College's Code of Practice and the endorsed national testing forms.

Recommendations to Provide a Quality Service

1	Agreed access and documentation processes should be in place for neuro intensive care, neurosurgery and neurology specialist advice when required.

2	Patients with perceived devastating brain injury should be admitted to intensive care to aid prognostication as per national consensus guidance, unless the extent of co-morbidity makes continued organ support of no overall benefit regardless of potential neurological recovery.
3	EEG monitoring should be available for patients with refractory generalised status epilepticus.
4	Assessment and management of patients with prolonged disorders of consciousness should follow national guidance, including specialist input from an expert Prolonged Disorders of Consciousness Physician.

3.12 INFECTION CONTROL

Minimum Standards

1	ICUs must identify an embedded ICU nurse who has protected time to carry out IPC duties on intensive care.
2	ICUs must comply with national standard infection control precautions (SICPs) and transmission-based precautions (TBPs), adapted if necessary, according to local need.
3	All patients must undergo a clinical risk assessment for Carbapenemase-producing Enterobacterales (CPE) screening at admission to intensive care.
4	All patients must be screened for carriage of Methicillin Resistant Staphylococcus aureus (MRSA) at admission to intensive care and those identified as MRSA positive be offered topical decolonisation/suppression.
5	ICUs must comply with Infection Prevention Society High Impact Interventions or equivalent, adapted if necessary, according to local need (except those dealing with prevention of surgical site infection).
6	ICU patients must have scheduled and predictable weekday interactions with a microbiologist (or equivalent).
7	ICUs must contribute to national surveillance of nosocomial infection through local surveillance and reporting.

Recommendations to Provide a Quality Service

1	ICUs should identify a clinical lead for infection control, which includes a responsibility for ICU antimicrobial stewardship.
2	All patients should undergo a clinical risk assessment and, if necessary, screening for other pathogens as locally appropriate at admission to intensive care.

3.13 MAJOR TRAUMA

Minimum Standards

1	Patients accepted to an MTC must not be delayed due to lack of intensive care capacity.
2	Each MTC ICU must have a nominated lead consultant and lead nurse for major trauma.
3	Each MTC ICU must have guidelines for the multi-specialty and multidisciplinary management of major trauma as determined by the major trauma network.
4	ICUs caring for major trauma patients must facilitate appropriate multidisciplinary services for trauma focussed care and rehabilitation.

Recommendations to Provide a Quality Service

1	Each critical care network or equivalent should develop and implement a trauma intensive care clinical advisory service, led by the MTC, where the intensive care clinicians at the MTC can support the care of patients with traumatic injuries admitted to TUs.
2	Each TU should have named link consultant intensivist and senior ICU nurse to facilitate liaison and other interactions with the MTC ICU.
3	Nurses caring for major trauma patients in intensive care should have undertaken the appropriate trauma focussed training and achieved the required competencies.
4	There should be a specific intensive care trauma quality improvement programme within each MTC.
5	Movement and positional restrictions and advice, for example following spinal or pelvic fractures, should be reviewed daily by the relevant specialist team with the objective of relaxing the restrictions as early as possible.

6	Trauma patients in intensive care should be considered for recruitment into trauma-specific research studies.
7	Patients should be repatriated from the MTC to their local TU, between ICUs, when the acute phase of trauma care has been completed.
8	Where ICU to ICU repatriation is appropriate, it should be completed within 48 hours of acceptance.
9	ICUs should participate in local and regional Emergency Preparedness, Resilience and Response (EPRR) planning.
10	ICUs should be able to demonstrate participation in simulations and exercises focussed on major incidents involving multiple trauma causalities.

3.14 INTER- AND INTRA- HOSPITAL TRANSFER OF THE CRITICALLY ILL ADULT PATIENT

Minimum Standards

1	Transfer for immediate lifesaving interventions (time critical interventions) must not be delayed or prevented by the availability of an intensive care bed.
2	The decision to undertake inter-hospital transfer must be made jointly by consultants at the referring and receiving hospitals.
3	There must be documented evidence of a risk assessment prior to any transfer (inter or intra).
4	All clinical team members involved in the transfer (inter or intrahospital) of critically ill patients must be trained and competent in intensive care transfer.
5	Critically ill patients requiring transfer must receive the same level of monitoring as they would within an ICU.
6	Critically ill patients requiring transfer must have the same level of documentation as they would within an ICU.

Recommendations to Provide a Quality Service

1	Where dedicated Adult Critical Care Transfer Services are available, all referrals for inter-hospital transfer of critically ill or injured patients should be made to these services.
2	Patients requiring repatriation to their local hospital to continue care should be transferred within 48 hours of acceptance by the receiving hospital.
3	ICUs should have a lead consultant responsible for intensive care transfer who oversees education and training, governance arrangements, audit and quality improvement initiatives and data analysis to ensure that patients undergoing intra- and inter-hospital transfer receive the same quality care.
4	Acute hospitals should have access to a CEN compliant intensive care transfer trolley with appropriate equipment securely mounted to it, which is regularly checked and serviced.
5	Acute hospitals should have dedicated intensive care transfer equipment and drugs bags that contain at least the minimum stock detailed in the Guidelines on the transfer of the critically ill adult 2026.
6	Dedicated intra- and inter-hospital transfer checklists should be used throughout the transfer process to ensure adequate preparation and to enhance patient and accompanying staff safety (available in the Guidelines on the transfer of the critically ill adult 2026).

3.15 LEGAL ASPECTS OF CAPACITY AND DECISION MAKING

Minimum Standards

1	Determination of capacity for a specific treatment/refusal of treatment must be made and communicated by the treating clinician in accordance with the relevant legal framework for capacity, that is applicable to the UK Home Nation, in which the patient is being treated.
2	The basis for all treatment decisions regarding patients who lack capacity must be documented and be specific to the proposed intervention.
3	When the patient has validly made choices in advance (by way of making an advance decision to refuse treatment, an advance statement of their wishes, or in England, Wales and Scotland, by appointing an attorney) every effort must be made to implement those choices.
4	All efforts must be made to allow critically ill patients to exercise their capacity.

5	ICM consultants must have 24-hour access to the organisation's legal team, with clear and specific local guidance detailing how to request legal advice.

Recommendations to Provide a Quality Service	
1	ICUs should provide regular training for staff, outlining how to undertake capacity assessments in intensive care for the management of patients who may lack capacity.
2	Capacity is decision and time specific, and capacity should be assessed with the level of care that is commensurate with the nature/severity of the decision.
3	Where decisions involving capacitous patients may lead to serious consequences, senior doctors should be involved in assessing capacity.
4	ICUs should have access to a second opinion from a senior doctor, external to the organisation and mediation services, in the event of disagreement.
5	In cases of intractable conflict, staff support should be provided in the form of debrief, psychological interventions or wellbeing advice.

3.16 MANAGING ACUTE BEHAVIOURAL DISTURBANCES

Minimum Standards	
1	ICUs must have a guideline for the management of patients with acute severe behavioural disturbance, including rapid tranquilisation.
2	ICUs must have policies in place for the management of visitors to the unit who display violence and aggression.
3	ICUs must have written guidance for the use of patient restraint.
4	Appropriate patient monitoring must be used when rapid tranquilisation methods are deployed.
5	ICUs must have 24/7 immediate/rapid access to personnel who have training in de-escalation and, where appropriate, physical restraint.
6	A capacity assessment must be undertaken on a patient, in accordance with the relevant UK Home Nation's capacity legal framework, prior to the administration of rapid tranquilisation and/or restraint and recorded in the medical records at the earliest opportunity.
7	ICUs must have 24/7 access to emergency mental health services.

Recommendations for a quality service	
1	All senior medical and nursing staff should receive de-escalation training.
2	ICUs should consider training senior medical and nursing staff in the use of safe physical restraint in the clinical setting.
3	All ICUs should have personnel trained in supporting staff who have been involved in caring for patients/ relatives with acute severe behavioural disturbances.
4	ICUs should be able to surge their staffing capacity to 2:1 or even 3:1 nursing/HCA capacity when managing patients with acute severe behavioural disturbance.

3.17 CARE OF THE CHRONICALLY CRITICALLY ILL PATIENT

Minimum Standards	
1	A robust process must be in place within each ICU to identify patients with, or at risk of, chronic critical illness.
2	A named senior member of the clinical team must be identified to coordinate and lead a multidisciplinary team, responsible for the care of chronically critically ill patients.
3	Resource demands and needs of all chronically critically ill patients must be audited in line with departmental clinical governance frameworks.
4	A weekly multidisciplinary patient review of all patients with chronic critical illness must occur using a standardised clinical tool.
5	Goals and care plan aims from the multidisciplinary patient review must be clearly recorded in the medical notes.
6	There must be documented discussions with the patient and their nominated family and friends on expected prognosis, outcomes and the degree of associated morbidity and with the referring clinical team.

Recommendations to Provide a Quality Service	
1	A personalised rehabilitation plan, informed by a standardised clinical tool, should be available.
2	A copy of the rehabilitation plan should be provided at the point of ICU discharge to the receiving team, patient and their family and friends.
3	Services should utilise recognised key performance indicators which include both patient-reported outcome measures and patient/family and friends reported evaluation measures.
4	Visits from the ward multidisciplinary team and visits to receiving clinical areas should be considered to support the transition from ICU areas after discharge.
5	Prior to ICU discharge, a decision reached in discussion with the patient and their family and friends regarding readmission to ICU should be recorded and communicated as part of handover.

3.18 CARE OF THE CRITICALLY ILL PREGNANT (OR RECENTLY PREGNANT) PATIENT

Minimum Standards	
1	ICUs admitting maternity patients must be prepared for obstetric emergencies such as unplanned birth, postpartum haemorrhage, and maternal cardiac arrest.
2	All intensive care services (including outreach) caring for maternity patients must appoint a named lead clinician and a lead nurse for maternal critical care.
3	All maternity patients admitted to intensive care must have evidence of a clearly documented, multidisciplinary, intensive care, obstetric and anaesthetic consultant-led review at least once every 24 hours.
4	Intensive care services must establish a clearly defined 24/7 escalation route for maternity patients to access intensive care, including from enhanced maternal care units when they have separate oversight.
5	Local measures must be in place to promote and facilitate breastfeeding, including milk expression, and to ensure routine contact between the patient and their newborn whilst receiving intensive care.
Recommendations To Provide a Quality Service	
1	Each ACC network (or equivalent) should develop a strategy for regional maternal critical care provision.
2	Each ACC network (or equivalent), should appoint a clinical lead for maternal critical care to liaise with the regional maternal medicine network (regional lead clinicians for maternal medicine where unavailable), assist in developing escalation pathways, support coordinated quality improvement and educational initiatives.
3	For maternity admissions to intensive care expected to exceed 48 hours, a documented multidisciplinary discussion should involve regional expertise in maternal medicine and maternal critical care, through the maternal medicine networks (or regional lead clinicians).
4	Local policies should be developed for the care of critically ill maternity patients.
5	Consultants in intensive care should have an active role in multidisciplinary discussions and meetings concerning the pre-conception, antenatal, peripartum and post-partum care of patients with significant pathology, especially those likely to require ICU admission.
6	The transfer of critically ill maternity patients should follow the specific guidance for this patient group.
7	There should be clearly defined pathways for AHPs in intensive care, and intensive care pharmacists to access experienced support from regional/supra-regional colleagues experienced in maternity care.
8	Intensive care and outreach from intensive care services should contribute to maternal critical care and enhanced maternal care training for doctors, nurses, midwives, and the broader multidisciplinary team.
9	Local training should be regularly reviewed to ensure that competencies and exposure to the management of maternal critical care align with up-to-date clinical guidance and practice.
10	When inclusion criteria are met, ICUs should actively promote the inclusion of maternity patients in clinical research trials and studies.
11	Data relating to enhanced maternal care and maternal critical care should be routinely collected and reviewed to enable benchmarking and improve outcomes, with insights disseminated to the wider multidisciplinary team.

3.19 CARE OF THE CRITICALLY ILL ADULTY IN AN ADULT INTENSIVE CARE UNIT

Minimum Standards

1	Critically ill children under 16 years old must only be admitted to and stay on an adult ICU if a PCCU bed is not immediately available.
2	Admission must be discussed and agreed by the local adult intensive care consultant, the admitting local consultant (e.g. paediatrician or paediatric surgeon) and the PCCU consultant (this may be the regional paediatric transport team consultant) at the time of admission and daily thereafter.
3	A local consultant paediatrician or PCCU consultant and a paediatric nurse must be available for advice 24/7.
4	A nominated lead intensive care consultant and lead nurse in the adult ICU must be responsible for intensive care policies, procedures and training related to the care of children, including transition.
5	Protocols for resuscitation, stabilisation, accessing advice, maintenance and transfer of critically ill children and the provision of paediatric critical care must be available.
6	An adult ICU that may provide care for critically ill children must have drugs and equipment appropriate to the age of the children who may be admitted available and checked in line with local policy.
7	Escalation, end of life and organ donation decisions must be discussed in collaboration with the regional PCCU consultant (this may be the regional paediatric transport team consultant), under a shared care model.
8	There must be collaborative working between the adult ICU and the regional PCCU to ensure that staff are supported to work outside their normal core competencies.
9	There must be 24-hour access for parents/carers to visit their child.

Recommendations to Provide a Quality Service

1	The child should be reviewed by a local consultant paediatrician and paediatric nurse twice a day during their stay on the adult ICU.
2	An onsite anaesthetist, intensivist, paediatrician or other healthcare professional with competence in advanced paediatric resuscitation and life support and advanced airway management should be immediately available 24/7.
3	A consultant anaesthetist, intensivist or paediatrician competent in advanced paediatric resuscitation and life support and advanced paediatric airway management, should be available 24/7 and able to attend the hospital within 30 minutes.
4	There should be access to specialist paediatric healthcare professionals, allied health professionals and pharmacy advice 24/7.
5	All adult ICUs should actively engage with transition from paediatric to adult intensive care services for children approaching adulthood with complex and potentially life limiting diseases.
6	Local agreement and processes for the care of 16-18 year olds should be agreed between paediatric and adult intensive care services.

3.20 REHABILITATION

Minimum Standards

1	A comprehensive assessment of rehabilitation needs, using a standardised assessment proforma/tool, must be carried out within four days of admission to intensive care and updated at ICU discharge, using a validated screening tool.
2	Those patients identified to have rehabilitation needs must have a clearly documented, personalised, multidisciplinary rehabilitation plan which is updated weekly and handed over to the receiving team at ICU discharge.
3	Rehabilitation goal setting must occur at least weekly for all patients engaged in rehabilitation, with input from all members of the multidisciplinary team, and include the patient where possible.
4	A comprehensive reassessment must take place two to three months after discharge either in person or remotely using a validated screening tool.

5	Delivery of the multidisciplinary rehabilitation plan must be audited in line with departmental clinical governance frameworks.
6	All intensive care staff with patient facing roles must have pain, agitation, delirium, immobilisation, and sleep (PADIS) education as part of their ICU induction.
7	There must be a documented structured assessment of PADIS on the daily medical review to improve recognition, standardisation of treatment and improve patient outcomes post ICU delirium.
8	Written information at the time of discharge from hospital, including ongoing rehabilitation plans and discharge information, must be communicated to the patient, their general practitioner and other secondary care professionals offering ongoing care.
Recommendations to Provide a Quality Service	
1	A standardised assessment proforma/tool of rehabilitation needs should be used to ensure that all required specialties are included.
2	Assessments post hospital discharge should consider and measure patient recovery or persistent deficits that were identified at ICU and hospital discharge.
3	A member of the ICU multidisciplinary team should be named on the rehabilitation plan as contact for staff and patients to provide ongoing advice and support throughout the recovery pathway, up to the time of follow-up assessment.
4	There should be a dedicated clinical lead for intensive care rehabilitation.
5	Post-ICU discharge, patients should be followed up on the ward by a designated member of the ICU multidisciplinary team to support their rehabilitation plan.
6	There should be a holistic assessment of a patient's current limitations and include encouragement to participate in identified activities which are purposeful to the patient with a view to regaining independence of function.

3.21 OUTPATIENT FOLLOW-UP

Minimum Standards	
1	All patients at risk of PICS, must be assessed for PICS following ICU stepdown.
2	Information about the post ICU outpatient services and support available must be communicated to patients, their family and friends, and/or their caregiver(s).
3	All ICUs must provide a case mix-appropriate post-ICU recovery outpatient clinic delivered by dedicated staff.
4	Post-ICU recovery outpatient clinic services must assess and manage both physical and non-physical (cognitive and psychosocial) domains.
5	Every post-ICU recovery outpatient clinic consultation must provide a letter to the patient or their caregiver and the patient's GP which summarises the consultation and, where appropriate, the ICU stay.
6	All post-ICU recovery outpatient clinic services must produce a standard operating procedure (SOP) and scheduled reports of activity/performance, including the proportion of eligible patients seen.
Recommendations to Provide a Quality Service	
1	All ICUs should have a multiprofessional post-ICU recovery outpatient clinic team.
2	All post-ICU recovery outpatient clinic teams should provide digital or paper format information about common post-ICU problems signposting to advice, guidance and support that incorporates social and financial wellbeing resources.
3	All post-ICU recovery outpatient teams should have access to ICU diaries and an ICU patient and relatives peer support group.
4	All post-ICU recovery outpatient teams should complete a systematic enquiry into common post-ICU problems and gather patient-reported outcome measures, within three months of hospital discharge, where possible.
5	Post-ICU consultation clinic letters should include details of post ICU issues identified, individualised recovery goals, and recommended actions.
6	All post-ICU recovery outpatient teams should incorporate patient and caregiver feedback about their ICU experience and the outpatient clinic to co-design and improve these services.

3.22 CARE AT THE END OF LIFE

Minimum Standards

1	ICUs must have an identified clinical lead for EoLC.
2	There must be clear and comprehensive documentation of a shared decision-making process for all end-of-life patients in the medical record.
3	Clear access pathways must be in place for appropriate patients who wish to transfer to another EoLC setting such as a hospice or home.
4	Multidisciplinary teams must manage EoLC patients including senior intensive care medical and nursing staff, referring teams and specialty palliative care teams.
5	ICUs must have a standardised process to regularly assess and document symptom control (including pain and anxiety/agitation/delirium at a minimum) in patients at the end-of-life.
6	Anticipatory medication must be prescribed using an individualised approach considering the patient's needs, views, values, and preferences.
7	ICUs must use recognised validated tools that encompass spiritual, emotional, practical, physical, and psychological needs and pain scores (e.g. RESPECT).
8	The diagnosis and confirmation of death must follow the circulatory or neurological criteria set out by the Academy of Medical Royal Colleges in 'A Code of Practice for the Diagnosis and Confirmation of Death'.
9	Access to bereavement support and follow up must be available for patients, families/friends and staff who have experienced end-of-life decision making.

Recommendations to Provide a Quality Service

1	ICUs should have guidance in place that provides patients the opportunity to have individualised EoLC specific to their wishes e.g. access to pets, outdoor space, and a personalised environment.
2	Close family and friends should be able to remain with a patient receiving end-of-life care throughout the day and night.
3	ICUs should provide space for close family and friends who wish to stay overnight with a dying patient, within or close to the ICU.
4	Intensive care morbidity and mortality meetings should regularly include a review of the effectiveness of any symptom management protocols and the overcall care provided for patients (and their families/friends) who received care at the end-of-life.

3.23 ORGAN AND TISSUE DONATION

Minimum Standards

1	Intensive care staff must consider organ and tissue donation for all patients reaching end of life in the ICU, as part of a holistic care plan.
2	Each acute health board/trust must have a clinical lead for organ donation (CLOD) who works with a specialist nurse for organ donation (SNOD) to ensure best practice in donation is delivered and local policies are up to date.
3	The diagnosis and confirmation of death must follow the circulatory or neurological criteria set out by the Academy of Medical Royal Colleges in A Code of Practice for the Diagnosis and Confirmation of Death.
4	ICUs must contribute data to the NHS Blood and Transplant (NHSBT) national potential donor audit.
5	ICUs must use national guidance to optimise donor care after consent/authorisation to increase organ utilisation and optimise transplant outcomes.

Recommendations to Provide a Quality Service

1	The intensive care team should be represented on the health board/trust's Organ Donation Committee, which provides oversight of all aspects of deceased organ and tissue donation.

2	The CLOD and SNOD should regularly review and share within the ICU local performance data from the NHSBT national potential donor audit, to ensure that timely identification and notification of potential donors to organ donation services is occurring.
3	The CLOD and SNOD should regularly review and share within the ICU local performance data from the NHSBT national potential donor audit, to ensure that any approach to the family for organ donation is a collaborative approach by the intensive care team and the SNOD.
4	The Donation Actions Framework provides detailed guidance on the professional, legal and ethical considerations for donation in England, Wales and Northern Ireland and should be used to support decision-making and guide practice, with recognition of the applicable legislation.
5	All intensive care staff likely to be involved in the care of potential organ or tissue donors should receive training in the principles of donation so that patients and their families can receive the care and support they need during the donation process.

4.1 RESEARCH

Minimum Standards

1	All individuals participating in research activity must have completed Good Clinical Practice (GCP) training for research and keep this up to date.

Recommendations to Provide A Quality Service

1	All ICUs should participate in research.
2	ICUs should have a nominated research lead (usually, but not necessarily, a medical consultant) who coordinates activity and is the principal liaison with trust/health board research and development (R&D) departments and the National Institute of Health and Care Research (NIHR) Regional Research Delivery Network (RRDN) Critical Care Lead, or equivalent in the devolved nations.
3	The nominated research lead should have dedicated and funded time within their job plan or equivalent to perform this role.
4	ICUs should participate in research networks, which are organised through the NIHR RRDN or equivalent in the devolved nations.
5	All research studies should be registered on the NIHR Critical Care Research Portfolio (overseen by the Critical Care National Specialty Group) whenever they fulfil eligibility criteria.
6	ICUs participating in research should provide information to patients, relatives, and surrogate decision makers (SDMs) about ongoing research, for example through posters, leaflets, or within generic intensive care information resources.
7	ICUs participating in research should have clear procedures for approaching patients, families, and SDMs in a manner that minimises stress and/or burden, but that also provides adequate information in a timely manner.
8	ICUs delivering multiple studies should implement processes to support co-enrolment including patient tracking, and clear communication between individuals taking consent.

4.2 AUDIT AND QUALITY IMPROVEMENT

Minimum Standards

1	ICUs must have a structured and planned clinical audit programme to compare practice to published standards.
2	ICUs must participate in a national patient outcome benchmarking audit.
3	There must be an identified lead(s) for the audit programme, with appropriate resources and time allocation for the role.
4	ICUs must have a QI programme to support the processes of care.
5	ICUs must be able to clearly evidence change as a result of audit, QI and measured patient outcomes.

Recommendations to Provide a Quality Service

1	Multidisciplinary staff should be encouraged and supported to train in QI methodology.
2	QI projects should be multidisciplinary where possible.

3	ICUs should have robust data-collection systems in place that support the collection of activity and quality data for local and national audit, and QI programmes.

4.3 CLINICAL GOVERNANCE

Minimum Standards

1	There must be an appropriately trained intensive care consultant and senior nurse identified as leads for clinical governance.
2	Clinical governance processes must be fair, transparent and free from bias and discrimination as well as being supportive of staff, patients and their families.
3	There must be regular multidisciplinary governance meetings where progress and completion of incidents, risks, complaints, regular audits and learning from governance is discussed.
4	All intensive care services must maintain and regularly review a risk register.
5	There must be a robust system for reporting, investigating and learning from all patient safety incidents which includes a clear pathway to the hospital board level.
6	ICUs must hold regular structured and minuted, multidisciplinary morbidity and mortality meetings in which clinical staff will discuss learning from deaths, incidents, good practice and risks.
7	Key performance indicators (KPIs) must be identified, both locally and according to national benchmarking audits.
8	Local and relevant national guidelines must be readily available to clinicians.
9	All staff must receive training (ideally at induction) on access to relevant patient care information.
10	Regular quality of care feedback must be obtained using (i.e. using safety surveys and relatives' questionnaires) and the results shared.

Recommendations to Provide a Quality Service

1	There should be a robust system for identification of cases requiring structured mortality review, which includes significant incidents, concerns on the part of patients, families, clinicians, medical examiners or coroners/ procurator fiscals and written complaints.
2	Staff undertaking structured mortality review should be adequately trained, of sufficient seniority and have appropriate time to complete the process.
3	A programme of quality service improvement should be in place with close links to governance as a source of targeted improvement.

4.4 PATIENT SAFETY STANDARDS

Minimum Standards

1	Waveform capnography must be used to confirm endotracheal tube placement and continuously monitored for patients who are invasively ventilated.
2	Patients must be assessed daily for risk of thromboembolic disease and receive appropriate prophylaxis.
3	The type and placement of nasogastric feeding tubes (NGTs) used for enteral feeding, hydration and/or drug administration, must comply with National Patient Safety Agency guidelines.
4	There must be a robust system for reporting, investigating and learning from all patient safety incidents which includes pathways to trust/board-level governance committees.
5	Regular handwashing audits must show compliance with the WHO '5 moments of hand hygiene' and standard infection control precautions.
6	Two-dimensional (2-D) imaging ultrasound guidance must be used where cannulation of the internal jugular, axillary or femoral vessels is undertaken.
7	Each ICU must use local safety standards for invasive procedures (LocSSIPs), adapted from national safety standards for invasive procedures (NatSSIPs) where available.
8	Units must follow an evidence-based guideline for the prevention of ventilator associated pneumonia.

9	Rates of bloodstream, catheter associated, and ventilator associated infections must be monitored as part of a nosocomial infection surveillance system.

4.5 ENVIRONMENTAL SUSTAINABILITY

Minimum Standards

1	Environmental sustainability must be included at all stages, from construction to operation, when planning or redeveloping an intensive care area.
2	Statutory standards, such as the NHS Net Zero Building Standard (or equivalent standards) must be followed.
3	The environmental cost of equipment and consumables must be included in all procurement evaluations and decisions.
4	Intensive care services must demonstrate compliance with current NHS standards for waste management.

Recommendations to Provide a Quality Service

1	Intensive care services should have a clinical lead (from within any clinical profession in intensive care) for environmental sustainability.
2	Environmental sustainability should be a regular and fixed agenda item in intensive care service quality meetings.
3	The topic of environmental sustainability should be included in departmental inductions and ongoing education programmes, accessible to all intensive care staff.
4	All quality improvement initiatives in ICUs should include an evaluation of sustainable value, which considers the environmental, social, and financial impacts of change, along with patient and population outcomes.
5	Intensive care services should demonstrate integration of evidence-based practices which avoid waste, whilst delivering safe and high-quality care in their daily routines.
6	Intensive care services should actively engage in initiatives to support the appropriate use of PPE, such as gloves awareness campaigns.
7	Evidence of adherence to the NIHR Carbon Reduction Guidelines should be sought as part of the approval process for research carried out in intensive care.
8	ICUs should collaborate at a regional level in support of efforts to improve environmental sustainability.

5.1 CAPACITY MANAGEMENT

Minimum Standards

1	Acute hospitals must model their number of intensive care beds based upon expected need.
2	All ICUs in England must report their bed capacity to the national Directory of Services (DoS) twice a day and include a CRITCON score.
3	Intensive care must only be used for patients who require intensive care services with any breaches reported using the hospital incident reporting system.
4	The duty consultant and the duty nurse in charge of the ICU must jointly make the final decision on the safe utilisation of intensive care beds and this decision is not to be over-ridden.
5	ICUs must have documented capacity escalation plans suitable for their hospital facilities, which are reviewed routinely and ratified at board level.
6	ICUs must have an escalation policy which covers the exceptional circumstance of providing Level 3 care outside of the unit.
7	Transfer to other hospitals' ICUs to create capacity (inter-hospital capacity transfer or non-clinical transfer) must be conducted only when all internal options to avoid transfer have been exhausted.
8	Inter-hospital capacity transfers must be reported using the hospital incident reporting system, formally reviewed and reported to the executive team.
9	Inter-hospital capacity transfers for the purposes of facilitating elective surgery must be avoided.

10	Regional intensive care networks must have escalation plans documented and agreed at board level in hospitals, to allow the duty ICM Consultant and duty nurse in charge to support the coordination and use of intensive care beds across the region.
11	Regional intensive care networks must have an agreed policy on escalation of care during times of high demand.

Recommendations To Provide A Quality Service	
1	Health boards, networks and regions should model their number and location of intensive care beds based upon the expected need for their patient population.
2	To deliver a quality service, individual ICUs should contribute towards health boards, networks and regions having 10 intensive care beds per 100,000 people in their catchment population (aged 16 and over.
3	All ICUs should model their occupancy and admissions to predict their daily emergency admission requirements and provide this information to hospital wide bed management to inform decisions before starting major elective surgical cases.
4	ICUs should have a policy for surge activity in exceptional circumstances such as major incidents and pandemics.

5.2 SURGE AND BUSINESS CONTINUITY PLANNING

Minimum Standards	
1	Hospitals with an ICU must have their own escalation plan and BCP.
2	Multi-site hospitals running more than one ICU must have flexible cross-site planning to help with surge and continuity planning.
3	Adult critical care networks, health boards and regions must have oversight to assist in the event of surge and BCP being activated.
4	ICUs must have local SOPs (including action cards and checklists) for disruption of business continuity including fire and evacuation surge, IT system failures and downtime, and major incidents.
5	ICUs must use recognised escalation scales to communicate resource strain either in the ICU or within the wider hospital (e.g. CRITCON and OPEL).

Recommendations to Provide a Quality Service	
1	As lack of intensive care capacity is frequently the rate-limiting factor in surge events, trusts/health boards should prospectively identify areas within their acute hospital sites to allow for expansion of intensive care capacity.
2	If increased activity is anticipated, the increase in requirement for consumables, including medical gas supplies, should be quantified in advance using the concept of 'days of supply'.
3	Business continuity plans should include a multidisciplinary approach with specific reference to pharmaceuticals.

5.3 MAJOR INCIDENTS

Minimum Standards	
1	Acute hospital major incident plans must encompass intensive care medicine.
2	All hospitals designated receiving hospitals with Level 3 intensive care capability must have a plan to double their normal Level 3 ventilated capacity and to maintain this for up to 96 hours.
3	Clinical standards must be maintained during a major incident.
4	All hospitals must have an evacuation and shelter plan that includes evacuation and shelter of highly dependent patients, including, but not exclusively, intensive care patients, if the intensive care areas become unusable for any reason.
5	All hospitals must have a lockdown plan that includes all intensive care areas, to prevent unauthorised access.

Recommendations to Provide a Quality Service	
1	The local intensive care leads should be involved in the formulation of acute hospital major incident plans.
2	Intensive care should have access to emergency planning and response training including strategic/crisis leadership.

3	Intensive care staff should participate in the local and regional multidisciplinary exercises including 'table-top' and 'live' exercises to further refine local and regional plans and communication routes between organisations and networks.
4	Intensive care leads should work with their EPRR team to facilitate exercises in the evacuation of very dependent patients from any part of their hospital.
5	Action cards should be available for all staff to use on activation of the plan, which include information and communication routes that are to be used.
6	Advance consideration of staff workforce requirements, including mutual aid from colleagues in other departments or neighbouring hospitals should form part of the intensive care service planning.
7	Staff welfare should be actively supported during an incident with access to informal, immediate debrief and later formal counselling.

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5.4 HIGH CONSEQUENCE INFECTIOUS DISEASES: INITIAL ISOLATION AND MANAGEMENT

Minimum Standards

1	Each ICU must ensure that there are local contingency plans in place for the initial isolation and management of critically ill patients with suspected HCIDs.
2	Local contingency plans must be regularly practised and reviewed, including the use of table-top exercises and simulations.
3	ICUs must liaise with local Directors of Infection Prevention and Control to ensure the correct personal protective equipment (PPE) is procured and sufficient stocks are readily available for use by appropriately trained intensive care staff in the event it is required.

Recommendations To Provide A Quality Service	
1	There should be a standard operating procedure in place to guide the management of a patient with a suspected HCID.
2	An intensive care consultant should have responsibility for intensive care aspects of local emergency planning and resilience preparations, incorporating plans for the appropriate isolation and management of suspected patients with HCID.
3	A clinical area where critically ill patients with a suspected HCID may be isolated, either within the ICU or elsewhere, should be prospectively identified and ideally utilising negative pressure rooms with anterooms where available.
4	All clinical equipment used in the management of a patient with a HCID should be dedicated to that patient alone and be single use where possible.
5	Training should be provided on a regular basis to ensure intensive care staff are familiar with using and safely removing PPE.
6	Staff should undergo annual fit testing of respiratory protective equipment (e.g. FFP3 masks).
7	Intensive care staff providing care for a patient with a suspected or confirmed HCID should be dedicated to the care of that patient on a clinical shift and not provide concurrent care for other patients, limiting the risk of cross-infection.
8	Contingency planning should incorporate plans for securely holding the large volume of clinical waste resulting from clinical care, including discarded contaminated PPE.
9	Patients with a suspected viral haemorrhagic fever should be risk assessed in accordance with the Advisory Committee on Dangerous Pathogens Viral Haemorrhagic Fever (ACDP VHF) Risk Assessment algorithm and investigations to exclude malaria promptly undertaken, in keeping with local procedures.
10	Patients with suspected airborne HCIDs should be risk assessed according to national guidelines where they exist (disease-specific, e.g. MERS guidance collections or generic airborne HCID guidelines, as appropriate).
11	ICUs accepting international medical transfers should have a mechanism by which to perform a risk assessment prior to transfer if a patient is being transferred from a country with known HCID outbreaks or countries where there is a significant risk of specific HCIDs; refer to national guidance (disease specific or generic HCID guidance).

5.5 FIRE AND EVACUATION

Minimum Standards	
1	All ICUs must have an appropriate number of well-marked and accessible fire call points, fire extinguishers (of appropriate type) and oxygen shut off valves.
2	All ICUs must comply with the latest health department regulations in their country regarding the fire-retardant nature of all furnishings, including mattresses, chairs, bedding, flooring and curtains.
3	All staff must undertake appropriate fire and evacuation training with regular updates in the clinical areas where they work.
4	All ICUs must have an emergency evacuation plan which is regularly reviewed.
5	Regional intensive care networks must have an agreed policy on escalation of care and mutual aid to ensure the safe provision of intensive care for all patients who require it in the region, including for a major incident in one ICU.
6	Portable oxygen cylinders must be stored safely in an appropriate holder or other designated storage area with the valve and flowmeter turned off in a location where they are readily available in an emergency but do not compromise potential evacuation routes.
7	Staff must ensure they follow recommendations for the safe use of oxygen cylinders at all times and that any problem with oxygen cylinders or equipment is reported immediately to both the medical gas supplier and the Medicines and Healthcare products Regulatory Authority (MHRA).

Recommendations to Provide a Quality Service	
1	ICU fire alarms should be audible throughout the department.

2	Ventilation of ICUs and other clinical areas where high-flow nasal oxygen, facemask continuous positive airway pressure and non-invasive ventilation are in use should be >10 air changes per hour to prevent oxygen enrichment of the ambient atmosphere.
3	Action cards should be displayed clearly at fire call points and other relevant places within the ICU, so that they are immediately accessible in an emergency.
4	A computerised fire alarm handler system should be installed in hospital switchboards to make it quicker and easier to liaise with the fire and rescue services.
5	All staff should know where to find the evacuation plan.
6	ICUs should have a system whereby staff involved in a critical event (such as a fire and emergency evacuation) receive debriefing and appropriate review for signs of a trauma stress reaction or post-traumatic stress disorder (PTSD).
7	Each ICU's evacuation policy should link with the hospital major incident plan and be tested regularly, both as tabletop exercises and in simulation scenarios, including at night and out-of- hours.

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