Acute and Critical Care Nursing at a Glance

Helen Dutton
Jacqui Finch

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Acute and Critical Care Nursing at a Glance

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Acute and Critical Care Nursing at a Glance

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Preface

In 2000, the UK Department of Health's publication the *Comprehensive Critical Care – A Review of Adult Critical Care Services* classified patients according to the severity of their illness. This led to the concept of 'critical care without walls', identifying the presence of acutely unwell patients outside the Intensive Care Unit and acknowledging that specialist nurse education and training in recognition and preliminary management of acute deterioration, was now required in all areas of clinical practice. Since that time, society's growing, diverse and ageing population has augmented this need and an ever increasing use of technology in care settings has meant that practitioners are frequently required to plan, implement and evaluate care for patients with complex, multiple problems in a variety of clinical settings. Certainly, the expansion of community services has meant that many patients are successfully managed outside the hospital. However, the centralisation of acute services in healthcare, especially for emergency medicine, has seen a huge demand for in-hospital bed capacity in some areas. This has led to the increasing development of a wide range of assessment units designed to manage large numbers of patients presenting to hospital with acute problems. Over recent years the development of critical care outreach teams and the birth of track and trigger systems all assist with this, but there still remains a great need for nurses to further develop their assessment skills and their ability to promptly and appropriately respond to worsening clinical scenarios and life-threatening events. The 2015 Nursing and Midwifery Council Code of Conduct clearly states that registered nurses and midwives must, at all times, 'preserve safety'. Whilst acknowledging the limits of their competence, they have to be able to assess accurately the patients in their care, taking account of current evidence and knowledge and demonstrate the ability to make timely referral. Failure to achieve this standard is failure to act in the patients' best interests.

It has been suggested that nurses may possess differing perspectives on what clinical deterioration actually is. This may be irrespective of the scoring systems that exist to assist them and, of course, the tools themselves are sometimes subject to misinterpretation and misuse. One way to address this is to revisit the basic principles of normality and abnormality when considering how a patient might present, systematically collecting subjective and objective data in order to recognise when problems are occurring. Development of sound clinical reasoning like this, strongly founded in evidence-based knowledge, will vastly contribute to the provision of quality care, ensuring patient safety both now and in the future.

The chapters in the book are structured according to the systematic ABCDE framework.[1] This emphasises the priorities of care when faced with an acutely unwell patient and use of the 'at a glance' approach greatly facilitates this with its focus on immediacy. To complement this, in each chapter the text and accompanying diagrams present key information in a concise format, using current evidence gathered from local, national and international policies, protocols and guidelines. In addition, the inclusion of patient case studies and multiple choice questions covering a range of specialist content also serve to highlight significant issues in practice, enabling consolidation of learning by way of self-assessment. In summary, we hope this book will be a good reference source for our readers (be they registered or student practitioners), fostering their critical thinking. We also hope, in the interests of evidence-based quality care, that it creates a desire in our readers to learn more about critical care and that this knowledge is used to teach and support others who are providing care to the acutely ill.

Helen Dutton
Jacqui Finch

[1]Resuscitation Council UK (2015) The ABCDE approach. https://www.resus.org.uk/resuscitation-guidelines/abcde-approach/

Abbreviations

A	Aorta
ABCDE	Airway, breathing, circulation, disability circulation
ABG	Arterial blood gas
ACEI	Angiotensin converting enzyme inhibitors
ACP	Advance care plan
ACS	Acute coronary syndrome
ACTH	Adrenocorticotrophic hormone
ADH	Antidiuretic hormone
AECOPD	Acute exacerbations of COPD
AF	Atrial fibrillation
AKI	Acute kidney injury
ALS	Adult advanced life support
AMI	Acute myocardial infarction
AMPLE	Allergies, Medications, Past medical history, Last ate and drank, Events leading (to injury)
AMTS	Abbreviated Mental Test Score
ANNT	Aseptic non-touch technique
ANS	Autonomic nervous system
ARB	Angiotensin receptor blockers
ARDS	Acute respiratory distress syndrome
ATOMFC	Airway, tension pneumothorax, open pneumothorax, massive haemothorax, flail chest, cardiac tamponade
ATP	Adenosine triphosphate
AV	Atrioventricular
AVN	Atrioventricular node
AVPU	Alert, voice, pain, unresponsive
BBB	Blood–brain barrier
BiPAP	Bi-level positive airways pressure
BMI	Body mass index
BMR	Basal metabolic rate
BNP	B-type natriuretic peptide
BP	Blood pressure
CA	Cardiac arrest
Ca^+	Calcium ion
CABG	Coronary artery bypass grafting
CAM ICU	Confusion assessment method: Intensive care unit
CAP	Community-acquired pneumonia
CCF	Congestive cardiac failure
CCOT	Critical care outreach team
CHF	Chronic heart failure
CO	Cardiac output
COPD	Chronic obstructive pulmonary disease
CPAP	Continuous positive airways pressure
CPB	Cardiopulmonary bypass
CPR	Cardiopulmonary resuscitation
CQC	Care Quality Commission
CRBSI	Catheter-related blood stream infection
CRF	Chronic respiratory failure
CRP	C-reactive protein
CRT	Capillary refill time
CSF	Cerebrospinal fluid
CT	Computed tomography
CTPA	Computerised tomographic pulmonary angiography
CURB 65	Confusion, urea, respiratory rate, systolic blood pressure (age ≥65)
CVA	Cerebrovascular accident
CVC	Central venous catheter/cardiovascular centre
CVP	Central venous pressure
CXR	Chest X-ray
DDAVP	1- deamino-8-D-arginine vasopressin
DI	Diabetes insipidus
DINAMAP	Direct non-invasive automated mean arterial blood pressure measurement
DKA	Diabetic ketoacidosis
DNAR	Do not attempt to resuscitate
DVT	Deep vein thrombosis
ECG	Electrocardiogram
EPAP	End positive airways pressure
ERCP	Endoscopic retrograde cholangio-pancreatogram
ERV	Expiratory reserve volume
ETT	Endotracheal tube
EWS	Early warning systems
FBAO	Foreign body airway obstruction
FEV_1	Forced expiratory volume in one second
FRC	Functional residual capacity
FVC	Forced vital capacity
GABA	Gabba amino butyric acid
GAD-7	Generalised anxiety disorder assessment
GCS	Glasgow Coma Scale
GFR	Glomerular filtration rate
GI	Gastrointestinal
GTN	Glyceryl trinitrate
H^+	Hydrogen ions

HADS	Hospital anxiety and depression scale
HAP	Hospital-acquired pneumonia
HCO_3^-	Bicarbonate ion
HCAI	Healthcare-associated infection
HDU	High dependency unit
HF	Heart failure
HFNC	High flow nasal cannula
HFPEF	Heart failure with preserved ejection fraction
HHS	Hyperglycaemic hyperosmolar syndrome
HME	Heat and moisture exchanger
HR	Heart rate
I:E ratio	The ratio of inspiration to expiration
ICD	Implantable cardioverter
ICP	Intracranial pressure
ICU	Intensive care unit
IPAP	Inspiratory positive airways pressure
IV	Intravenous
JVD	Jugular venous distension
JVP	Jugular venous pressure
K^+	Potassium ion
LMA	Laryngeal mask airway
LMWH	Low molecular weight heparin
LOC	Level of consciousness
LPA	Lasting power of attorney
LV	Left ventricle
LVF	Left ventricular failure
LVSD	Left ventricular systolic dysfunction
mAChR	Muscarinic receptors
MAP	Mean arterial pressure
Mg^{++}	Magnesium ion
$MgSO_4$	Magnesium sulphate
MI	Myocardial infarction
MILS	Manual in-line stabilisation
MODS	Multiple organ dysfunction syndrome
MRI	Magnetic resonance imaging
MUST	Malnutrition universal screening tool
Na^+	Sodium ion
NATMIST	Name, age, time of injury, mechanism of injury, injuries sustained, signs and symptoms, treatments given
NC	Nasal cannula
NEWS	National Early Warning Score
NICE	The National Institute for Health and Care Excellence
NIV	Non-invasive ventilation
NSTEMI	Non-ST-segment elevated myocardial infarction
NPA	Nasopharyngeal airway
NSAID	Non-steroidal anti-inflammatory drugs
OPA	Oropharyngeal airway
PA	Pulmonary artery
PAO_2	The partial pressure of oxygen in the alveoli
PAINAD	Pain Assessment in Advanced Dementia
PaO_2	The partial pressure of oxygen in arterial blood
PCA	Patient-controlled analgesia
PCI	Percutaneous coronary intervention
PCT	Proximal convoluted tubule
PE	Pulmonary embolism
PEEP	Positive end expired pressure
PEF	Peak expiratory flow
PEFR	Peak expiratory flow rate
PNS	Parasympathetic nervous system
PPCI	Primary percutaneous coronary intervention
PPE	Personal protective equipment
PS	Pressure support
PSP	Primary spontaneous pneumothorax
qSOFA	Quick Sequential (Sepsis Related) Organ Failure Assessment
RA	Right atrium
RAAS	Renin-angiotensin-aldosterone system
REM	Rapid eye movement
ROSC	Return of spontaneous circulation
RR	Respiratory rate
RV	Residual volume/Right ventricle
SAN	Sinoatrial node
SAH	Subarachnoid haemorrhage
SBAR	Situation, background, assessment, recommendation
SBP	Systolic blood pressure
SIADH	Syndrome of inappropriate ADH
SNS	Sympathetic nervous system
SOCRATES	Site, onset, character, radiation, associated symptoms, time course, exacerbating and relieving factors, severity
SP	Secondary pneumothorax
SpO_2	Oxygen saturation of peripheral capillary blood
SSP	Secondary spontaneous pneumothorax
SSRI	Selective Serotonin re-uptake inhibitor
STEMI	ST elevation myocardial infarction
Sup.VC	Superior vena cava
SV	Stroke volume
SVR	Systemic vascular resistance
SVT	Supraventricular tachycardia
TBSA	Total body surface area
TIA	Transient ischaemic attack
TIMI	Thrombolysis in myocardial infarction
TIPS	Trans intrahepatic portosystemic shunt
TSH	Thyroid-stimulating hormone
V/Q	Ventilation/perfusion
VATS	Video-assisted thoracoscopic surgery
VBG	Venous blood gas
V_E	Minute ventilation
VF	Ventricular fibrillation
VIP	Visual infusion phlebitis
V_T	Tidal volume
VT	Ventricular tachycardia
VTE	Venous thromboembolism
WBC	White blood cells
WCC	White cell count
WHO	World Health Organization
WOB	Work of breathing

About the companion website

Don't forget to visit the companion website for this book:

www.ataglanceseries.com/nursing/acutecare

There you will find valuable material designed to enhance your learning, including:

- Interactive multiple choice questions
- Nine patient case studies with questions and answers

Nursing in acute and critical care

Part 1

Chapters

1 Critical care without walls 2
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1 Critical care without walls

Figure 1.1 Critical Care without walls

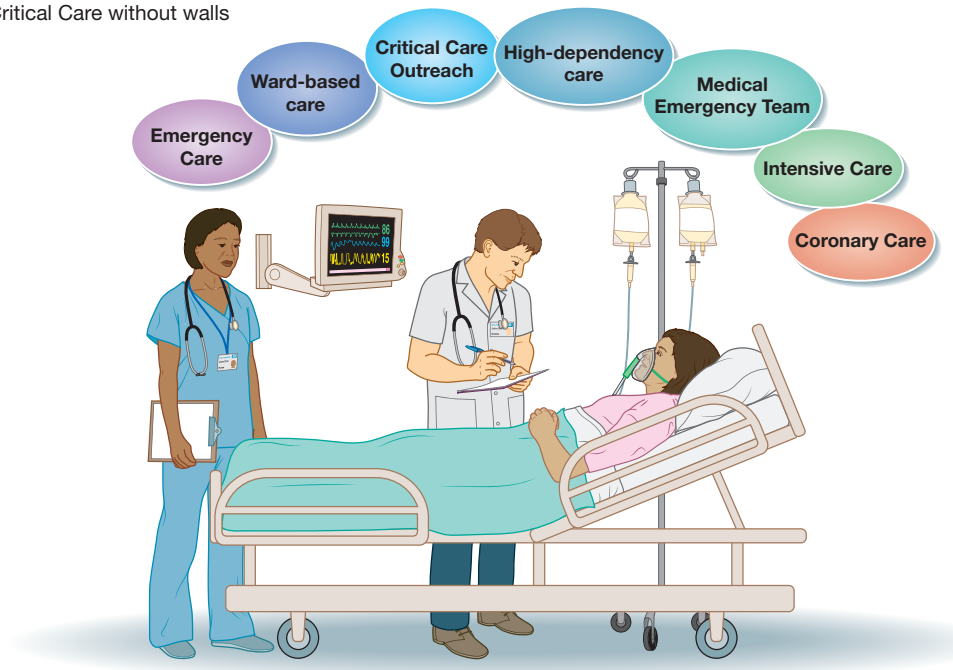


Table 1.1 Selections from 'The Safer Nursing Care Tool', endorsed by NICE (2014), recommended staffing levels increase according to patient dependency.
Source: http://shelfordgroup.org[10]

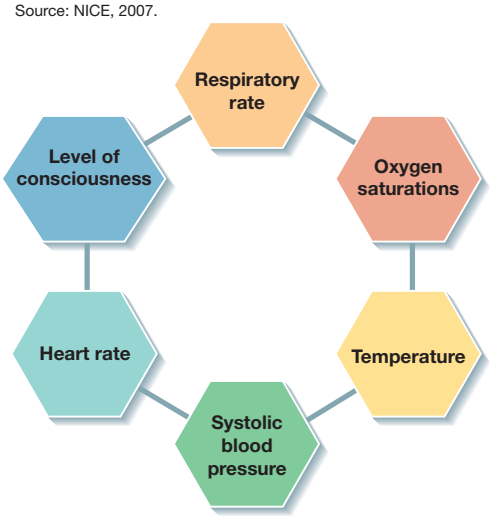
Level of care	Descriptor
Level 1a Acutely ill patients requiring intervention or those who are **UNSTABLE** with a **GREATER POTENTIAL** to deteriorate	Care requirements may include the following: • Increased level of observations and interventions • Early Warning Score – trigger point • Postoperative care following complex surgery • Emergency admissions requiring immediate intervention • Oxygen therapy greater than 35% +/– • Post 24 hours following insertion of tracheostomy • Severe infection or sepsis
Level 1b Patients who are in a **STABLE** condition but are dependent on nursing care to meet most or all of the activities of daily living	Care requirements may include the following: • Complex wound management requiring more than one nurse or takes more than one hour to complete • Mobility or repositioning difficulties requiring assistance of two people • Patient and/or carers requiring enhanced psychological support • Patients on End of Life Care Pathway • Confused patients who are at risk or requiring constant supervision • Potential for self-harm, requiring observation
Level 2 May be managed within clearly identified, designated beds, resources with the required expertise and staffing level *OR* may require transfer to a dedicated level 2 facility/unit	• Deteriorating/compromised single organ system • Postoperative optimisation (preop invasive monitoring)/extended postop care • Patients requiring non-invasive ventilation/ respiratory support; CPAP/BiPAP in acute respiratory failure • First 24 hours following tracheostomy insertion • Requires: greater than 50% oxygen, continuous cardiac monitoring and invasive pressure monitoring • Drug infusions requiring more intensive monitoring e.g. vasoactive drugs (inotropes, GTN) or potassium, magnesium • CNS depression of airway and protective reflexes • Invasive neurological monitoring

Box 1.1 The Sepsis 6. Source: http://sepsistrust.org

To be initiated on suspicion of sepsis:

1 Administer high flow oxygen to meet target saturations
2 Take blood cultures and consider infective source
3 Administer intravenous antibiotics
4 Give intravenous fluid resuscitation
5 Check Hb and serial Lactates
6 Commence hourly urine measurements

Figure 1.2 Six key physiological parameters.
Source: NICE, 2007.



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The last decade has seen a change in the environment in which care of the acutely unwell patient is delivered. Nurses working in acute care areas are increasingly exposed to patients who require more detailed assessment and monitoring. Nurses need to be competent in the skills required to care effectively for critically ill patients.

Changing patterns in acute care

The general population is ageing, with those requiring hospital admission older, sicker and generally more dependent. In 2010 the over-65 age group accounted for 10 million of the population in the UK, and by 2030 the number will be closer to 15.5 million. Emergency admissions for patients who have increasingly complex comorbidities requiring multidisciplinary and cross-speciality input are increasing. Meanwhile, greater emphasis has been placed on managing patients in their home environment for longer periods, meaning those who are admitted to hospital are sicker and require greater use of resources. Technological developments in healthcare means that treatments once thought too high a risk are now commonplace in hospitals.

With the increase in patient acuity it became evident that wards were not always able to cope effectively with the extra demands placed on them. Studies in the late 1990s identified that the deteriorating patient was not always recognised, and/or sufficient action was not taken prior to admission into the intensive care unit (ICU), adversely affecting patient outcome.

Reconfiguration of critical care services

In 2000 the Department of Health[1] published its report, *Comprehensive Critical Care*, recommending a systems approach was taken to deliver care for patients during acute and critical illness, and in the recovery period. Critical care emerged as a new speciality, addressing the severity of patient illness, regardless of their physical location within the hospital. The Department of Health introduced the concept of 'critical care without walls', to ensure acutely unwell patients nursed in a variety of environments, from ward-based care through to intensive care, come under the 'critical care umbrella' (Figure 1.1). A spectrum of dependency levels from levels 0 to 3, were outlined to encompass all those requiring critical care:[1]

- *Level 0*: Patients whose needs can be met through normal care in an acute hospital.
- *Level 1*: Patients at risk of their condition deteriorating, or those recently relocated from higher levels of care whose needs can be met on an acute ward with advice and support.
- *Level 2*: Patients requiring more detailed observation or interventions, including support for single organ failure, postoperative care, and those stepping down from a higher level of care.
- *Level 3*: Patients requiring advanced respiratory support or support of at least two organs, including all complex patients requiring support for multiorgan failure.

Workforce development, to ensure that staff caring for potentially critically ill patients receive education and training, is essential.[2] Key clinical competencies to be achieved have been identified.[3] Registered nurses are accountable for all aspects of care, even those tasks often delegated to others, such as the taking and recording of observations.[4]

Safe staffing levels

The Intensive Care Society (2013) and others published core standards for organisation of intensive care units (levels 2 and 3) and recommended safe staffing levels.[5] As acutely unwell patients are nursed across a range of environments, there are challenges for the provision of safe staffing levels on acute wards, which have been highlighted by the Francis Report (2013).[6] **NICE** (2014) issued guidance for safe staffing for nurses in acute hospitals supporting 'The Safer Nursing Care Tool' (Table 1.1).[2] This tool is based on the Department of Health classification, but adds an additional level, 1b, acknowledging the differing demands on nursing care activities, such as supporting the patient at risk of self-harm. It is designed to inform nursing establishments to be planned, linked to patient acuity both in ward-based care and critical care units.

Resuscitation to medical emergency

Cardiac arrests are predictable and preventable. Survival to discharge post cardiac arrest is as low as 15%.[7] Early recognition of deterioration is the first step in the chain of survival. Almost half of patients who die without a 'do not attempt resuscitation' (**DNAR**) order have serious, potentially reversible abnormalities in their vital signs in the 24 h preceding death. In fact, slow, progressive physiological deterioration with unrecognised and inadequately treated hypoxaemia and hypotension, can often be seen prior to admission to ICU and leads to poor survival. Delays in time to treatment have a profound effect on patient outcome. Specific intervention and timely instigation of organ support, via a medical emergency team or critical care outreach team (CCOT), is more important than getting the patient to the ICU.

Critical care outreach

Critical care outreach teams have evolved to provide expert input outside the environment of intensive and high dependency units. They aim to avert or ensure timely admissions to critical/intensive care and share critical care skills across the multidisciplinary team. Implementation of early therapies, for example, high flow oxygen, fluid resuscitation, or care bundles such as the 'Sepsis Six' (Box 1.1) can improve mortality and reduce rates of cardiac arrest. The CCOT's role in sharing critical care skills, improving early recognition of deterioration, has empowered nurses to escalate care appropriately and is now a widely adopted approach to maintaining patient safety.

Monitoring the acutely unwell patient

Recommendations to improve the recording of six key physiological observations (Figure 1.2), include the use of multiparameter Early Warning Scores to help identify patients at risk and escalate care appropriately.[8] The National Early Warning Score (**NEWS**)[9] (see Chapter 3) is a well-validated tool in the recognition and prevention of deterioration, and is now used widely in acute care trusts throughout the UK. Acutely unwell patients require competent and confident nurses to interpret clinical signs, recognise risk of deterioration and escalate care to the appropriate healthcare professional, ensuring senior medical input occurs in a timely manner to optimise patient outcome.