# Intensive Care Nursing

## Fourth Edition

### A Framework for Practice

Philip Woodrow

ROUTLEDGE

# Intensive Care Nursing

Especially written for qualified nurses working in intensive care nursing units, this comprehensive text has been developed to be as accessible as possible. This fourth edition has been revised throughout to ensure the evidence base is completely up to date and the content reflects contemporary best practice.

*Intensive Care Nursing* is structured in user-friendly sections. The chapters contain sections outlining the "fundamental knowledge" needed to understand key chapters, "implications for practice" boxes, further reading and resources overviews, "time out" sections for revision and clinical scenarios with questions included. Reviewed throughout by experienced practitioners and teachers, it covers:

- patient-focused issues of bedside nursing;
- the technical knowledge necessary to care safely for ICU patients;
- the more common and specialised disease processes and treatments encountered;
- how nurses can use their knowledge and skills to develop their own and others' practice.

Written by a practice development nurse with a strong clinical background in intensive care nursing and experience of teaching nursing, *Intensive Care Nursing* is essential reading for nurses and health professionals working with seriously ill patients, particularly those undertaking post-registration training in the area.

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## A Framework for Practice

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To the States or any one of them, or any city of the States,
Resist much, obey little,
Once unquestioning obedience, once fully enslaved,
Once fully enslaved, no nation, state, city, of this earth,
ever afterwards resumes its liberty.

Walt Whitman

Fashion, even in medicine.

Voltaire

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# Preface

This book is for ICU nurses. Intensive care is a diverse speciality, with many sub-specialities. Even within a single ICU, the range of pathologies and treatments seen may vary considerably. No text can hope to cover every possible condition readers may see, and general texts cannot cover topics comprehensively. My aim for this edition, as in the previous ones, is to offer nurses working in general ICUs an overview of the more commonly encountered pathologies and treatments. This text will probably be most useful about six to 12 months into ICU nursing careers, so assumes that readers are already qualified nurses, with experience of caring for ventilated patients, but wish to develop their knowledge and practice further. Because some knowledge is assumed, "fundamental knowledge" is listed at the start of many chapters for readers to pursue any assumed aspects of which they are unsure. "Further reading" at the end of each chapter identifies some useful, and usually relatively easily accessible, resources for readers to pursue. Definitions of some technical terms can be found in the glossary – where these terms appear in the text they are italicised, although italics are sometimes used for other reasons – for example, standard practices of italicising names of publications and micro-organisms is followed.

This book focuses on nursing care of Level 3 patients. Level 2 patients are the focus of a companion volume (Woodrow, 2016). Some overlap between the two is inevitable, but where reasonably possible I have attempted to make the books complementary. Some topics relevant to Level 3 patients are included in the other text – for example, intrapleural chest drains and non-invasive ventilation. The title and terminology, "intensive care unit (ICU)", has been retained, rather than replaced with the often used "critical care unit (CCU)", largely to avoid confusion with coronary care units (also CCUs).

This fourth edition has provided the opportunity to update and develop contents; the structure remains essentially unchanged from the third edition. Much more could be covered, but a larger book would be less affordable, more unwieldy and less used. My priority in revising this book has therefore been to identify core issues within a similar-length text. Some links made to incorporate topics into chapters are tenuous, but I hope that their presence justifies this approach.

Many aspects are inevitably relevant to various chapters; as most readers are likely to "dip in" to parts of this book, there is some repetition. I have also cross-referenced to chapters in both this book and Woodrow (2016). The index and glossary are also useful resources for expanding knowledge of many aspects.

The amount of evidence continues to increase, together with increased accessibility through the internet. Increased numbers of meta-analyses and systematic reviews means that some sources are more comprehensive than were generally available when developing the first edition of this book. Conversely, the quantity of dubious evidence has also proliferated. Searching literature is therefore necessarily selective, heavily reliant on guidelines, meta-analyses and publications from key organisations, as well as being influenced by serendipity. I have tended to follow UK standards and guidelines; for example, biochemistry references ranges follow the UK's Pathology Harmony. Readers outside the UK should check standards in their own country. References to statute and civil law are usually English and Welsh law, so readers in Scotland and Northern Ireland and those outside the United Kingdom should check applicability to local legal systems. Selection and interpretation from this wealth of resources is mine, and like any other selection and interpretation is inevitably subjective.

Many controversies are identified, but all aspects of knowledge and practice should be actively questioned and constantly reassessed. I have tried to minimise errors, but some are almost inevitable in a text this size; like any other source, this text should be read critically. If this book encourages further debate among practising nurses it will have achieved its main purpose. My hope remains that this book benefits readers, and so contributes to delivering quality patient care.

*Philip Woodrow, 2018*

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Any book is inevitably a collaborative effort, and I am grateful to everyone who has contributed towards this text. Previous editions have benefitted in particular from advice of John Albarran and Jane Roe. Jane Roe also developed the scenarios used in the first edition, these have largely been retained in this edition. Reviewers and contributors towards text development include Grace McInnes (Commissioning Editor), Carolina Antunes (Editorial Assistant), Christina O'Brien (Production Editor), Josh Curtis and Richard Sanders (Project Management), Hugh Jackson (Copy-Editor), and Susan Leaper (Typesetting and Design Production).

The text has also been influenced by input from many other people, including reviewers, colleagues in the British Association of Critical Care Nurses, and East Kent Hospitals University NHS Foundation Trust – especially the staff of its three ICUs at Kent & Canterbury (Canterbury), Queen Elizabeth the Queen Mother (Margate) and William Harvey (Ashford) hospitals. I am especially grateful to the team at Routledge/Taylor & Francis for commissioning this fourth edition and supporting it throughout its development.

# Abbreviations

| | |
|---|---|
| < | less than |
| > | more than |
| 2,3 DPG | 2,3-diphosphoglycerate: a chemical in erythrocytes which aids oxygen dissociation from haemoglobin |
| ACS | acute coronary syndromes (see Chapter 29) |
| ACT | activated clotting times (normal 120–150 seconds) |
| AF | atrial fibrillation |
| AIDP | acute inflammatory demyelinating polyneuropathy |
| AIDS | acquired immunodeficiency syndrome |
| AMAN | acute motor axonal neuropathy |
| ANCA | antineutrophil cytoplasmic antibodies (test for renal vasculitis) |
| ANF | atrial natriuretic factor (also called atrial natriuretic peptide = ANP) |
| ANP | atrial natriuretic peptide (also called atrial natriuretic factor = ANF) |
| APACHE | acute physiology and chronic health evaluation |
| APRV | airway pressure release ventilation |
| ARC | AIDS-related complex |
| ARDS | acute respiratory distress syndrome (see Chapter 27) |
| ASV | adaptive support ventilation |
| ATP | adenosine triphosphate |
| AV | atrioventricular |
| BE | base excess |
| bpm | depending on context, "beats per minute" (heart rate) or "breaths per minute" (respiratory rate) |
| BSD | brainstem death |
| CCO | Critical Care Outreach |
| CABG | coronary artery bypass graft(s) |
| CCP | cerebral perfusion pressure |
| CD4, CD8 | CD = cluster designation; type of surface antigen; numbers refer to different types |
| CIDP | chronic inflammatory demyelinating polyneuropathy |
| CK | creatine kinase |
| CMV | controlled mechanical ventilation *or* cytomegalovirus |

| | |
|---|---|
| COP | colloid osmotic pressure |
| COPD | chronic obstructive pulmonary disease |
| CPAP | continuous positive airway pressure |
| *CPE* | carbapenemase-producing *enterobacteriacae* |
| CPP | cerebral perfusion pressure |
| *CRE* | *Carbapenem-resistant enterobacteriaceae* |
| CRP | C-reactive protein (see Chapter 21) |
| CRRT | continuous renal replacement therapy, blanket term used to describe any mode |
| CSF | cerebrospinal fluid |
| CT | computerised tomography (scan) |
| cTnI | (cardiac) troponin I |
| cTnT | (cardiac) troponin T |
| CVVH | continuous veno-venous haemofiltration |
| CVVHDF | continuous veno-venous haemodiafiltration |
| Da | daltons: a unit of molecular weight |
| DCD | donation after circulatory death |
| DIC | disseminated intravascular coagulation |
| DKA | diabetic ketoacidosis |
| DSa | digital subtraction angiography |
| DVT | deep-vein thrombosis |
| *E. coli* | *Escherichia coli*, a species of gram-negative bacteria, one of the major gut commensals; presence of *E. coli* in the blood (or wounds) is an infection |
| $ECCO_2R$ | extracorporeal carbon dioxide removal |
| ECLS | extracorporeal lung support |
| ECMO | extracorporeal membrane oxygenator |
| EfCCNa | European Federation of Critical Care Nursing Associations |
| eGFR | estimated glomerular filtration rate; normal > 90 ml/min/1.73m$^2$ |
| ELSD | Extracorporeal liver support devices |
| ESBL | extended spectrum beta-lactamases: enzymes producing cross-resistance to many antibiotics |
| $etCO_2$ | end-tidal carbon dioxide |
| ETT | endotracheal tube |
| EVAR | endovascular aneurysm repair |
| FDP | fibrin degradation product |
| FEV | forced expiratory volume (so $FEV_1$ = forced expiratory volume at one second) |
| FFP | fresh frozen plasma |
| $FiO_2$ | fraction of inspired oxygen (expressed as a decimal fraction, so $FiO_2$ 1.0 = 100% or pure oxygen) |
| FRIII | fixed-rate intravenous insulin infusion |
| FVC | functional ventilatory capacity |
| GBS | Guillain-Barré Syndrome |
| GCS | Glasgow Coma Scale |
| GFR | see eGFR |

| | |
|---|---|
| *GRE* | glycopeptide-resistant *Enterococci* (previously called *VRE*) |
| GTN | glyceryl trinitrate |
| HAI/HCAI | healthcare-associated infection |
| HAS | human albumin solution (i.e. albumin for infusion) |
| HbA | adult haemoglobin |
| HbF | foetal haemoglobin (abnormal after three months of age) |
| HBV | hepatitis B virus |
| Hct | haematocrit (also called "packed cell volume") |
| HCV | hepatitis C virus |
| HDL | high density lipoprotein |
| HELLP | Haemolysis elevated liver enzymes and low platelets |
| HHS | hyperosmolar hyperglycaemic state (= HONKS) |
| HITTS | heparin-induced thrombocytopenia and thrombosis syndrome |
| HIV | Human immunodeficiency virus (see Chapter 25) |
| HONKS | hyperosmolar non-ketotic state (= HHS) |
| HUS | haemolytic uraemic syndrome |
| Hz | hertz |
| I.C.N. | International Council of Nurses |
| I.C.S. | Intensive Care Society. |
| ICP | intracranial pressure |
| Ig | immunoglobulin (e.g. IgA = immunoglobulin A) |
| IL | interleukin |
| iLA | interventional lung assist |
| INR | international normalised ratio (measures clotting time – see Chapter 21) |
| iu | international units |
| IVI | intravenous infusion |
| IVIG | intravenous immunoglobulin |
| kDa | kiloDaltons (molecular weight), = 1000 daltons (Da) |
| kJ | kilojoule |
| LBBB | left bundle branch block |
| LDL | low density lipoprotein |
| LMW | low molecular weight (when prefixed to heparin) |
| MDMA | 3–4 methylenedioxymethamphetamine (ecstasy) |
| MetHb | methaemoglobin |
| MIDCAB | minimally invasive direct coronary artery bypass grafting |
| mmol | millimole |
| MODS | multi-organ dysfunction syndrome |
| MRI | magnetic resonance imaging |
| *MRSa* | meticillin-resistant *Staphylococcus aureus*, also called *multi-resistant Staphylococcus aureus*; originally spelled "methicillin" |
| NAFLD | non-alcoholic fatty liver disease |
| NASH | non-alcoholic steatohepatitis |
| NIRS | near infrared spectroscopy |
| NIV | non-invasive ventilation |
| NPi | neurological pupil index |

| | |
|---|---|
| NSAID | non-steroidal anti-inflammatory drug |
| NSTEMI | non-ST elevation myocardial infarction |
| $O_2Hb$ | fraction of total haemoglobin combined with oxygen |
| OPCAB | off-pump coronary artery bypass |
| $PaCO_2$ | arterial carbon dioxide (from blood gas) |
| $PaO_2$ | partial pressure of arterial oxygen |
| PAV | proportional assist ventilation |
| PCI | percutaneous coronary intervention |
| PCP | *Pneumocystis carinii* pneumonia (now retitled *Pneumocystis jirovici* pneumonia) |
| PCV | packed cell volume (also called "haematocrit") |
| PDIs | phosphodiesterase inhibitors |
| PE | pulmonary embolus |
| PEA | pulseless electrical activity |
| PEEP | positive end expiratory pressure |
| PERTL | pupils equal (and) react to light |
| PFC | perfluorocarbon |
| $PGI_2$ | prostaglandin $I_2$ (also called "prostacyclin") |
| PJP | *Pneumocystis jirovici* pneumonia |
| pPCI | primary percutaneous coronary interventions |
| PPE | personal protective equipment |
| PPI | proton pump inhibitors |
| PS | pressure support |
| PSV | pressure support ventilation |
| PTT | prothrombin time |
| PUFAs | polyunsaturated fatty acids |
| QALYs | quality adjusted life years |
| QTc | QT interval corrected to what it would be if heart rate were 60 bpm |
| RBBB | right bundle branch block |
| RCT | randomised controlled trial |
| RNA | ribonucleic acid |
| ROS | reactive oxygen species (see oxygen radicals) |
| RR | respiratory rate |
| SA | sinoatrial (node) |
| SBE | standardised base excess |
| SD plasma | solvent detergent plasma |
| SDD | selective digestive decontamination |
| SIADH | syndrome of inappropriate antidiuretic hormone |
| SIMV | synchronised intermittent mandatory ventilation |
| $SjO_2$ | jugular venous bulb saturation |
| SOD | selective oral decontamination |
| STEMI | ST elevation myocardial infarction |
| $StO_2$ | saturation of tissues (venous blood) by oxygen |
| SV | stroke volume |
| SVT | supraventricular tachycardia |

| | |
|---|---|
| TBI | traumatic brain injury |
| TIA | transient ischaemic attack |
| Tn | troponin |
| TNF | tumour necrosis factor |
| TNFα | tumour necrosis factor alpha |
| t-PA | tissue plasminogen activator, also called recombinant tissue plasminogen activator (rt-PA) |
| TTP | thrombotic thrombocytopenia purpura |
| TV | tidal volume (also written at $V_t$) |
| UA | unstable angina |
| V/Q | (alveolar) ventilation to (pulmonary capillary) perfusion ratio; minute volume compared with cardiac output. Normal V/Q = 0.8 |
| VALI | ventilator-associated lung injury (see VILI) |
| VAP | ventilator-associated pneumonia |
| VILI | ventilator-induced lung injury (see VALI) |
| *VRE* | vancomycin-resistant *Enterococci* (former name for *GRE*) |
| $V_t$ | tidal volume (also written at TV) |
| VT | ventricular tachycardia |
| $W/m^2$ | watts per square metre |
| WBC | white blood cells (in this text called "white cell count") |
| WCC | white cell count (see Chapter 21) |

Part I

# Contexts of care

Chapter 1

# Nursing perspectives

**Contents**

## Introduction

This book is about nursing care of critically ill (Level 3 – see Table 1.1) patients; a companion book (Woodrow, 2016) focuses on Level 2 patients.

The 60 years of intensive care units (ICUs) have seen various technologies, drugs and protocols developed to treat problems of critical illness. While many have found a valid niche, initial hopes have often been largely disappointed. What has been constant is the contribution of nurses and nursing to outcomes for critically ill patients. So what is the purpose of nurses in ICU? What does critical illness, and admission to intensive care, cost patients and their families? In the busyness of everyday practice, these fundamental questions can be too easily forgotten. Nursing is expensive, costing more than one quarter of acute trust budgets, and although ICU staffing costs vary, high nurse:patient ratios necessitate the need for ICU nurses to clarify their value (Bray *et al.*, 2009). This book explores issues for ICU nursing practice; this section establishes core fundamental aspects of ICU nursing. To help readers articulate the importance of their role, this first chapter explores what nursing means in the context of intensive care, while Chapter 2 outlines two schools of psychology (Behaviourism and Humanism) that have influenced healthcare and society.

A recurring theme of pathologies described are two responses:

- inflammation
- stress

These are innate defensive/protective responses. Balanced responses (appropriate to the threat) often help resolve non-critical illness. Critical illness typically occurs with imbalanced responses – insufficient response means disease can cause death, while excessive responses themselves become pathological.

***Table 1.1* Levels of care**

| | |
|---|---|
| *Level 0* | Patients whose needs can be met through normal ward 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 additional advice and support from the critical care team. |
| *Level 2* | Patients requiring more detailed observation or intervention including support for a single failing organ system or post-operative care and those "stepping down" from higher levels of care. |
| *Level 3* | Patients requiring advanced respiratory support alone or basic respiratory support together with support of at least two organ systems. This level includes all complex patients requiring support for multi-organ failure. |

**Source: D.O.H., 2000a; I.C.S., 2015**

## Technology

Intensive care is a young speciality. Ibsen is widely credited with creating the first "modern" ICU in 1953 (Reisner-Senelar, 2011). The first purpose-built intensive care unit (ICU) in the UK opened in 1964 (Ashworth, personal communication). ICUs offer potentially life-saving intervention during acute physiological crises, with emphasis on medical need and availability of technology.

Technology facilitates monitoring and treatment but can also be dehumanising (Almerud *et al.*, 2007). Patients, not machines, should remain the focus of care (Bagherian *et al.*, 2017). Nurses should ensure that the use of technology is compatible with the safety, dignity and rights of people (I.C.N., 2012). ICU patients, often disempowered by their disease and drugs, are confronted with environments designed for medical and technical support which can create barriers for patients and their care (Eriksson *et al.*, 2010), so advocacy remains a fundamental nursing role (Williams *et al.*, 2016). Nurses should develop therapeutic and Humanistic environments which help the patient as a whole person towards their recovery (Almerud *et al.*, 2007). For patients, caring behaviour and relieving their fear and worries are the most valuable aspects of nursing (Hofhuis *et al.*, 2008a).

## The patient . . .

Patients are admitted to intensive care because potentially reversible physiological crises threaten one or more body systems, and life (Crunden, 2010). Care therefore needs to focus primarily on supporting failed systems. This book discusses various aspects of technological and physiological care, many chapters focusing on specific systems and treatments. But these aspects should be placed in the context of the whole person. People are influenced by, and interact with, their environment. Extrinsic needs for:

- dignity
- privacy
- psychological support
- spiritual support

define each person as a unique individual, rather than just a biologically functioning organism.

Uniquely among healthcare workers, nurses are with the patient throughout their hospital stay. A fundamental role of nurses is to be with and be for the patient, as a whole person (McGrath, 2008). Person-centred care is widely cited in strategic documents, policy statements and organisational values, but its evaluation tends to be narrow and reductionist (Manley and McCormac, 2008).

## . . . Their relatives . . .

Relatives are an important part of each person's life (Wong *et al.*, 2015), giving patients courage to struggle for survival (Bergbom and Askwall, 2000).

So, caring for relatives is an important part of patient care (Davidson *et al.*, 2017). Of all staff, nurses are best placed to meet relatives' needs, and are a valuable source for updating relatives about progress (Iverson *et al.*, 2014; Wong *et al.*, 2015).

In contrast to the often-high-tech focus of staff, families of intensive care patients often focus on fundamental aspects of physiological needs, such as pain relief and communication (Tingle, 2007). Rather than ruminate by bedsides, afraid to touch their loved ones in case they interfere with some machine, relatives should be offered opportunities to be actively involved in care (Davidson *et al.*, 2017).

Physiological crises for patients often create psychological crises for their relatives (Wong *et al.*, 2015). Holistic patient care should include caring for their families (Bagherian *et al.*, 2017).

Relatives experience a range of emotions, including anxiety, anger and frustration (Turner-Cobb *et al.*, 2016). They are usually angry at the disease, but it is difficult to take anger out on a disease. Instead, anger, complaints or passive withdrawal may be directed at those nearby, who are usually nurses (Maunder, 1997). Relatives may blame themselves, however illogically, for their loved one's illness. They place low priorities on their own physical and physiological needs, such as rest and food (Padilla, 2014). Facilities for relatives should include a waiting room near the unit, somewhere to stay overnight and facilities to make refreshments (NHS Estates, 2003; B.A.C.C.N., 2012).

Relatives need information, both to cope with their own psychological crisis and to make decisions (Padilla, 2014; Gaeeni *et al.*, 2015). Relatives, and patients, may seek information from the internet, often immediately available through mobile telephones and tablets. While many internet resources are reliable, some are not and can be a source for misinformation and confusion. Nurses should therefore clarify relatives' understanding of pathological conditions, treatments and other aspects.

Relatives often have a psychological need for hope (Bagherian *et al.*, 2017), but with nearly one fifth of patients dying on the unit (Vincent *et al.*, 2009), and additional post-discharge mortality and morbidity, there may be little hope to offer. If death seems likely, relatives need to know so they can start grieving (Wright, 2007). Relatives often anticipate more positive outcomes than physicians (Lee Char *et al.*, 2010), so may be unconvinced when bad news is broken. Changes in critical illness may be rapid and unpredictable. Where possible, both the nurse caring for the patient and a senior doctor should inform the family of anticipated outcomes, away from the patient's bedside, preferably in a room where discussion will not be interrupted by others. The door should be closed for privacy, but access to doors should not be obstructed in case distressed relatives need to escape. Everyone should sit down, as family members may faint, and staff should not stand above relatives. Posture, manner and voice should be as open as possible. Tissues should be available. Having witnesses is useful in case relatives later complain. Detailed records of discussions should be recorded.

Relatives should be given time to think about information, express their emotions and ask anything they wish, and be offered opportunities for further discussions if they wish. An information book, including details of who to contact and support groups (such as CRUSE), is useful. Further discussion about end-of-life care can be found in Woodrow (2016).

### . . . And the nurse

Nurses monitor and assess patients. But nurses also provide care. Assessment is fundamental to providing care, but excessive paperwork can hinder care. Nursing assessments should therefore remain patient-focused, enabling nurses and others to deliver effective care. Proliferation of policies, protocols and competencies is often intended to ensure quality and parity of care wherever patients are admitted and whoever cares for them. But each patient is an individual and needs individualised nursing care. While guidance and safeguards can be useful, increasing protocols does not correlate with either compliance or reducing patient mortality (Sevransky *et al.*, 2015). Rather than introduce more proformas, nurses need to maintain and develop knowledge and skills to be able to adapt care to individualised patient needs.

Nurses should collaborate with other professions (N.M.C., 2015). Nurse-to-patient ratios for Level 3 patients should be 1:1 (I.C.S., 2015). The UK faces specific challenges: UK ICU patients are sicker than in most countries (Mandelstam, 2007), there are fewer ICU beds per 100,000 population (Adhikari *et al.*, 2010) than in other developed, and many Third World, countries. There is also disparity between the four UK countries: I.C.S. (2015) cite England as having seven beds per 100,000 population, compared with 3.2 in Wales and Scotland and 4.7 in Northern Ireland. For Level 2 patients, nurse:patient ratios should be 1:2 (I.C.S. 2015). These levels may reflect acuity of disease but often fail to reflect nursing workload: a conscious but delirious Level 2 patient often requires more nursing time than a fully sedated Level 3 patient. Decreasing staffing levels increase complication rates (EfCCNa, 2007) and mortality (Cho *et al.*, 2008; West *et al.*, 2009).

Nurses, and nursing, have valuable roles within intensive care. But staff are an expensive commodity. Even if economic pressures are ignored, the global shortage of nurses and ageing workforce (Crisp and Chen, 2014) limit supply. A pragmatic solution to both economic and recruitment limitations has been to develop support worker roles. Most units employing support workers have found they provide valuable contributions to teamwork. B.A.C.C.N. guidelines should protect patients, nurses and support workers from inappropriate delegation (Bray *et al.*, 2009).

Deterioration of acutely ill patients, and need for ICU admission, is often preventable (Hogan *et al.*, 2012; NHS Improvement, 2016). Comprehensive Critical Care (D.O.H. 2000a) recommended that acute hospitals should have a Critical Care Outreach service to prevent the avoidable deterioration of ward patients, and to facilitate their timely admission if ICU is needed. They also follow up on ICU patients after discharge back to wards, and sometimes

post-hospital discharge through "ICU clinics". CCO forms an important part of the ICU team, and concerns during discharge to wards should be escalated to them.

## Stress

Stress is frequently experienced by patients in ICU (Samuelson *et al.*, 2007), but it can also be a problem for relatives and staff. For staff, stress can lead to burnout, potentially causing staff to change careers and suffer mental ill health. Moss *et al.* (2016) suggest that burnout is especially common in staff caring for critically ill patients, although arguably stressors of nursing in other areas, while different, are potentially greater.

Stress is both a psychological and physiological phenomenon; psychology and physiology interact. Critically ill patients suffer physiological stress from their illness, and psychological stress from negative emotions, such as fear. Stress responses are defensive, activating the hypothalamic–pituitary–adrenal (HPA) axis (Chrousos, 2009; Steptoe and Kivimäki, 2012). The pituitary gland responds by releasing adrenocorticotrophic hormone (ACTH), which stimulates adrenal gland production of adrenaline (epinephrine) and noradrenaline (norepinephrine), with increased production of other hormones, including cortisol. This "fight or flight" response, discussed further in Chapter 31, increases:

- heart rate
- stroke volume
- systemic vascular resistance
- respiration rate
- blood sugar
- thrombolysis
- fluid retention.

While protective for healthy people facing acutely life-threatening confrontation, all factors are frequently detrimental with critical illness. Caring for both physical and psychological needs, nurses can add a humane, holistic perspective into patient care, transcending an often-hostile environment (McGrath, 2008).

## Duty of care

Nurses' primary duty of care should be to their patients. This includes a duty to maintain confidentiality (N.M.C., 2015). If patients are unable to express their wishes, and what information they wish shared with others, nurses should be cautious about sharing information even with close relatives and friends. Usually, if patients are unconscious, information will be given to the identified next of kin, who will usually be asked to liaise with other family and friends. Next of kin may identify a password to enable information to be shared