Handbook of Drugs in Intensive Care

A thoroughly updated edition of this well-established guide to drugs and prescribing for intensive care. The book is split into two sections: an A–Z guide to the drugs available, and concise notes on the key topics and situations faced on a daily basis. The A–Z section provides succinct information on each drug including uses, limitations, administration directions and adverse effects. The second section details complications that may arise in patients with particular conditions such as diabetes, epilepsy and renal failure, and other factors that may affect drug prescribing. There is also a section of key data, showing weight conversions, body mass index and corresponding dosage calculations. This edition includes a colour fold-out chart showing drug compatibility for intravenous administration. Presented in a concise, compact format, this book is an invaluable resource for doctors, nurses and other medical professionals caring for critically ill patients.

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This book is dedicated to Georgina Paw
Handbook of Drugs in Intensive Care: An A-Z Guide
3rd ed

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INTRODUCTION

The main challenge when I embarked in writing the third edition has been to keep it down to size. This third edition remains a concise book that explains how to use drugs safely and effectively in a critical care setting. Doctors, nurses and other professionals caring for the critically ill patient will find it useful. It is intended to be small enough to fit in the pocket and to provide sufficient information about drug prescribing in the critically ill patient. To keep the book down to size has meant restricting the list of drugs to ones that I consider as common drugs. It is not intended to list every conceivable complication and problem that can occur with a drug but to concentrate on those the clinician is likely to encounter. These constraints mean that this pocket book should be seen as complementary to, rather than replacing, the standard textbooks.

The book is composed of two main sections. The A-Z guide is the major part and is arranged alphabetically by the non-proprietary name of the drug. This format has made it easier for the user to find a particular drug when in a hurry. The discussion on an individual drug is restricted to its use in the critically ill adult patient. The second part is comprised of short notes on relevant intensive care topics.

While every effort has been made to check drug dosages based on a 70kg adult and information about every drug, it is still possible that errors may have crept in. I would therefore ask readers to check the information if it seems incorrect. In addition, I would be pleased to hear from any readers with suggestions about how this book can be improved. Comments should be sent via e-mail to: henry.paw@york.nhs.uk.

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European law (directive 92/27/EEC) requires the use of the Recommended International Non-proprietary Name (rINN) in place of the British Approved Name (BAN). For a small number of drugs these names are different. The Department of Health requires the use of BAN to cease and be replaced by rINN with the exceptions of adrenaline and noradrenaline. For these two drugs both their BAN and rINN will continue to be used.

The format of this book was chosen to make it more ‘user friendly’ – allowing the information to be readily available to the reader in times of need. For each drug there is a brief introduction, followed by the following categories:

**Uses**
This is the indication for the drug’s use in the critically ill. There will be some unlicensed use included and this will be indicated in brackets.

**Contraindications**
This includes conditions or circumstances in which the drug should not be used – the contraindications. For every drug, this includes known hypersensitivity to the particular drug or its constituents.

**Administration**
This includes the route and dosage for a 70 kg adult. For obese patients, estimated ideal body weight should be used in the calculation of the dosage (Appendix D). It also advises on dilutions and situations where dosage may have to be modified. To make up a dilution, the instruction ‘made up to 50 ml with 0.9% saline’ means that the final volume is 50 ml. In contrast, the instruction ‘to dilute with 50 ml 0.9% saline’ could result in a total volume >50 ml. It is recommended that no drug should be stored for >24 h after reconstitution or dilution.

**How not to use . . .**
Describes administration techniques or solutions for dilution which are not recommended.

**Adverse effects**
These are effects other than those desired.

**Cautions**
Warns of situations when the use of the drug is not contraindicated but needs to be carefully watched. This will include drug-drug interactions.
Organ failure
Highlights any specific problems that may occur when using the drug in a particular organ failure.

Renal replacement therapy
Provides guidance on the effects of haemofiltration/dialysis on the handling of the drug. For some drugs, data are either limited or not available.
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>ACE-I</td>
<td>angiotensin converting enzyme inhibitor</td>
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<tr>
<td>ACh</td>
<td>acetylcholine</td>
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<tr>
<td>ACT</td>
<td>activated clotting time</td>
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<tr>
<td>ADH</td>
<td>antidiuretic hormone</td>
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<tr>
<td>AF</td>
<td>atrial fibrillation</td>
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<tr>
<td>APTT</td>
<td>activated partial thromboplastin time</td>
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<tr>
<td>ARDS</td>
<td>acute respiratory distress syndrome</td>
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<td>AV</td>
<td>atrioventricular</td>
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<tr>
<td>BP</td>
<td>blood pressure</td>
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<tr>
<td>CABG</td>
<td>coronary artery bypass graft</td>
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<tr>
<td>cAMP</td>
<td>cyclic AMP</td>
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<tr>
<td>CC</td>
<td>creatinine clearance</td>
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<td>CMV</td>
<td>cytomegalovirus</td>
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<tr>
<td>CNS</td>
<td>central nervous system</td>
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<tr>
<td>CO</td>
<td>cardiac output</td>
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<tr>
<td>COPD</td>
<td>chronic obstructive pulmonary disease</td>
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<tr>
<td>CPR</td>
<td>cardiopulmonary resuscitation</td>
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<td>CSF</td>
<td>cerebrospinal fluid</td>
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<td>CT</td>
<td>computerised tomography</td>
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<tr>
<td>CVVH</td>
<td>continuous veno-venous haemofiltration</td>
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<td>CVVHHD</td>
<td>continuous veno-venous haemodiafiltration</td>
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<tr>
<td>DI</td>
<td>diabetes insipidus</td>
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<tr>
<td>DIC</td>
<td>disseminated intravascular coagulation</td>
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<td>deep vein thrombosis</td>
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<td>Epstein Barr virus</td>
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<td>electrocardiogram</td>
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<td>electroencephalogram</td>
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<td>EMD</td>
<td>electromechanical dissociation</td>
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<td>ETCO₂</td>
<td>end-tidal carbon dioxide concentration</td>
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<td>FBC</td>
<td>full blood count</td>
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<td>FFP</td>
<td>fresh frozen plasma</td>
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<td>gram</td>
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<td>GFR</td>
<td>glomerular filtration rate</td>
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<td>gastrointestinal</td>
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<td>HOCM</td>
<td>hypertrophic obstructive cardiomyopathy</td>
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<td>h</td>
<td>hour</td>
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<td>heart rate</td>
</tr>
<tr>
<td>ICP</td>
<td>intracranial pressure</td>
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<td>ICU</td>
<td>intensive care unit</td>
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<td>IHD</td>
<td>ischaemic heart disease</td>
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<td>IM</td>
<td>intramuscular</td>
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<td>INR</td>
<td>international normalised ratio</td>
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<td>IOP</td>
<td>intraocular pressure</td>
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<td>IPPV</td>
<td>intermittent positive pressure ventilation</td>
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<td>IV</td>
<td>intravenous</td>
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<td>K⁺</td>
<td>potassium</td>
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<tr>
<td>kg</td>
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l litre
LFT liver function tests
LMWH low molecular weight heparin
MAOI monoamine oxidase inhibitor
M6G morphine-6-glucuronide
mg milligram
MH malignant hyperthermia
MI myocardial infarction
MIC minimum inhibitory concentration
min minute
ml millilitre
MRSA methicillin-resistant *Staphylococcus aureus*
NG nasogastric route
ng nanogram
NJ nasojejunal
nocte at night
NSAID non-steroidal anti-inflammatory drugs
PaO₂ partial pressure of oxygen in arterial blood
PaCO₂ partial pressure of carbon dioxide in arterial blood
PCAS patient controlled analgesia system
PCP *Pneumocystis carinii* pneumonia
PCWP pulmonary capillary wedge pressure
PD peritoneal dialysis
PE pulmonary embolism
PEA pulseless electrical activity
PEG percutaneous endoscopic gastrostomy
PEJ percutaneous endoscopic jejunostomy
PO *per orum* (by mouth)
PR *per rectum* (rectal route)
PRN *pro re nata* (as required)
PVC polyvinyl chloride
PVD peripheral vascular disease
s second
SC subcutaneous
SIRS systemic inflammatory response syndrome
SL sublingual
SSRI selective serotonin re-uptake inhibitors
SVR systemic vascular resistance
SVT supraventricular tachycardia
TFT thyroid function tests
TNF tumour necrosis factor
TPN total parenteral nutrition
U&E urea and electrolytes
VF ventricular fibrillation
VRE Vancomycin-resistant *Enterococcus faecium*
VT ventricular tachycardia
WFI water for injection
WPW syndrome Wolff-Parkinson-White syndrome
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I would like to thank all my colleagues from whom I have sought advice during the preparation of this book. In particular, I acknowledge the assistance of Dr Neil Todd for microbiological advice.