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Oxford Handbook of Emergency Medicine

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OXFORD
UNIVERSITY PRESS

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Great Clarendon Street, Oxford OX2 6DP

Oxford University Press is a department of the University of Oxford.
It furthers the University's objective of excellence in research, scholarship,
and education by publishing worldwide in

Oxford New York

Auckland Cape Town Dar es Salaam Hong Kong Karachi

Kuala Lumpur Madrid Melbourne Mexico City Nairobi

New Delhi Shanghai Taipei Toronto

With offices in

Argentina Austria Brazil Chile Czech Republic France Greece

Guatemala Hungary Italy Japan Poland Portugal Singapore

South Korea Switzerland Thailand Turkey Ukraine Vietnam

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Published in the United States
by Oxford University Press Inc., New York

© Oxford University Press, 2012

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Database right Oxford University Press (maker)

First edition published 1999

Second edition published 2005

Third edition published 2006

Fourth edition published 2012

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British Library Cataloguing in Publication Data
Data available

Library of Congress Cataloging-in-Publication-Data
Data available

Typeset by Cenveo, Bangalore, India

Printed in Italy

on acid-free paper by

L.E.G.O. S.p.A.—Lavis TN

ISBN 978-0-19-958956-2

10 9 8 7 6 5 4 3 2 1

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and recommendations are for the non-pregnant adult who is not breastfeeding.

Dedicated to Dr Robin Mitchell (1964–2010)
Emergency Physician in Christchurch, Edinburgh and Auckland.
Outstanding clinician and teacher, tremendous colleague and friend.

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Abbreviations and symbols

°	degrees
≈	approximately
+ve	positive
-ve	negative
±	plus or minus
↑	increase(d)
↓	decrease(d)
ABC	airway, breathing, circulation
ABG	arterial blood gas
AC	acromio-clavicular
ACE	angiotensin-converting enzyme
ACTH	adrenocorticotrophic hormone
ACS	acute coronary syndrome
AF	atrial fibrillation
AIDS	acquired immune deficiency syndrome
AIO	Ambulance incident officer
AIS	abbreviated injury scale
ALS	advanced life support
ALT	alanine aminotransferase
ALTE	apparently life-threatening event
AP	antero-posterior
APLS	Advanced Paediatric Life Support
APTT	activated partial thromboplastin time
ARDS	adult respiratory distress syndrome
ARF	acute renal failure
AST	aspartate transaminase
ATLS	advanced trauma life support
AV	atrio-ventricular
bd	twice daily
BKPOP	below knee Plaster of Paris
BKWPOP	below knee walking Plaster of Paris
BLS	basic life support
BMG	bedside strip measurement of venous/capillary blood glucose
BNF	<i>British National Formulary</i>
BNFC	<i>British National Formulary for Children</i>

BP	blood pressure
BTS	British Thoracic Society
BZP	benzylpiperazine
CBRN	chemical, biological, radiological, nuclear
CCU	critical care unit
CK	creatinine kinase
cm	centimetre(s)
CMV	cytomegalovirus
CN	chloroacetophenone
CNS	central nervous system
CO	carbon monoxide
CO ₂	carbon dioxide
COHb	carboxyhaemoglobin
COPD	chronic obstructive pulmonary disease
CPAP	continuous positive airways pressure
CPR	cardiopulmonary resuscitation
CRF	chronic renal failure
CRP	C-reactive protein
CSF	cerebrospinal fluid
CT	computed tomography
CTPA	computed tomography pulmonary angiography
CVP	central venous pressure
CVS	cardiovascular system
CXR	chest X-ray
DIC	disseminated intravascular coagulation
DIPJ	distal interphalangeal joint
DKA	diabetic ketoacidosis
dL	decilitre
DPL	diagnostic peritoneal lavage
DPT	diphtheria, pertussis, and tetanus
DSH	deliberate self-harm
DVT	deep venous thrombosis
EBV	Epstein–Barr virus
ECG	electrocardiogram
ECT	electroconvulsive therapy
ED	emergency department
EEG	electroencephalogram
EMLA	eutectic mixture of local anaesthetics
ENT	ear, nose and throat
EPAP	expiratory positive airway pressure

ESR	erythrocyte sedimentation rate
ET	endotracheal
ETCO ₂	end-tidal carbon dioxide
FAST	focused assessment with sonography for trauma
FB	foreign body
FBC	full blood count
FFP	fresh frozen plasma
FG	French Gauge
FiO ₂	inspired oxygen concentration
FOB	faecal occult blood
G6-PD	glucose 6-phosphate dehydrogenase
g	gram(s)
G	gauge
GA	general anaesthetic
GCS	Glasgow Coma Score
GFR	glomerular filtration rate
GI	gastrointestinal
GHB	gamma-hydroxybutyrate
GMC	General Medical Council
GP	general practitioner
GTN	glyceryl trinitrate
GU	genitourinary
5HT	5-hydroxytryptamine
HATI	human anti-tetanus immunoglobulin
Hb	haemoglobin
HCG	human chorionic gonadotrophin
HCM	hypertrophic cardiomyopathy
Hct	haematocrit
HDU	high dependency unit
HHS	hyperosmolar hyperglycaemic state
HIV	human immunodeficiency virus
HONK	hyperosmolar non-ketotic hyperglycaemia
hr	hour/s
HTLV	human T-cell lymphotropic virus
ICP	intracranial pressure
ICU	intensive care unit
IDDM	insulin dependent diabetes mellitus
IHD	ischaemic heart disease
IM	intramuscular
INR	international normalized ratio (of prothrombin time)

IO	intra-osseous
IPAP	inspiratory positive airway pressure
IPg	interphalangeal
IPPV	intermittent positive pressure ventilation
ISS	injury severity score
ITP	idiopathic thrombocytopenic purpura
IUCD	intrauterine contraceptive device
IV	intravenous
IVI	intravenous infusion
IVRA	intravenous regional anaesthesia
IVU	intravenous urography
JVP	jugular venous pressure
KE	kinetic energy
kPa	kiloPascal(s) pressure
KUB	X-ray covering the area of kidneys, ureters and bladder
L	litre(s)
LA	local anaesthetic
LAD	left axis deviation
LBBB	left bundle branch block
LDH	lactate dehydrogenase
LET	lidocaine epinephrine tetracaine
LFTs	liver function tests
LMA	laryngeal mask airway
LMP	last menstrual period
LMWH	low molecular weight heparin
LP	lumbar puncture
LSD	lysergic acid diethylamide
LV	left ventricular
LVF	left ventricular failure
LVH	left ventricular hypertrophy
m	metre(s)
MAOI	monoamine oxidase inhibitor
MAST	military anti-shock trousers
max	maximum
MC	metacarpal
MCA	Mental Capacity Act
MCPJ	metacarpophalangeal joint
MDU	Medical Defence Union
MI	myocardial infarction
min	minute/s

MIO	medical incident officer
mL	millilitre(s)
mmHg	millimetres of mercury pressure
mmol	millimoles
MMR	mumps, measles, and rubella
MRI	magnetic resonance imaging
MRSA	meticillin resistant <i>Staphylococcus aureus</i>
MS	multiple sclerosis
MSU	mid-stream specimen of urine
MT	metatarsal
MTPJ	metatarsophalangeal joint
MUA	manipulation under anaesthetic
NAC	<i>N</i> -acetyl cysteine
NAI	non-accidental injury
ND	notifiable disease
NG	nasogastric
NHS	National Health Service
NIV	non-invasive ventilation
NO	nitrous oxide
NSAID	non-steroidal anti-inflammatory drug
NSTEMI	non-ST segment elevation myocardial infarction
NWBPOP	non-weight-bearing Plaster of Paris
O ₂	oxygen
OA	osteoarthritis
OCP	oral contraceptive pill
od	once daily
OPG	orthopantomogram
ORIF	open reduction and internal fixation
ORT	oral replacement therapy
PA	postero-anterior
PACS	picture archiving and communication system
PAN	polyarteritis nodosa
PCI	percutaneous coronary intervention
pCO ₂	arterial partial pressure of carbon dioxide
PCR	polymerase chain reaction
PE	pulmonary embolus
PEA	pulseless electrical activity
PEEP	positive end-expiratory pressure
PEFR	peak expiratory flow rate
PGL	persistent generalized lymphadenopathy

PICU	paediatric intensive care unit
PID	pelvic inflammatory disease
PIP	proximal interphalangeal joint
PO	per os (orally/by mouth)
pO ₂	arterial partial pressure of oxygen
POP	plaster of Paris
PPE	personal protective equipment
PPI	proton pump inhibitor
PR	per rectum
PRF	patient report form
PRN	pro re nata (as required)
PSP	primary spontaneous pneumothorax
PV	per vaginam
qds	four times a day
RA	rheumatoid arthritis
RAD	right axis deviation
RBBB	right bundle branch block
RBC	red blood cells
Rh	Rhesus
ROSC	restoration of spontaneous circulation
RR	respiratory rate
RSI	rapid sequence induction/intubation
RSV	respiratory syncytial virus
rtPA	recombinant tissue plasminogen activator
RTS	revised trauma score
RV	right ventricular
SA	sino-atrial
SARS	severe acute respiratory syndrome
SC	subcutaneous
SCIWORA	spinal cord injury without radiographic abnormality
sec	second(s)
SIDS	sudden infant death syndrome
SIGN	Scottish Intercollegiate Guidelines Network
SIRS	systemic inflammatory response syndrome
SL	sublingual
SLE	systemic lupus erythematosus
SpO ₂	arterial oxygen saturation
SSP	secondary spontaneous pneumothorax
SSRI	selective serotonin re-uptake inhibitor
STD	sexually transmitted disease

STEMI	ST segment elevation myocardial infarction
SVT	supraventricular tachycardia
T°	temperature
T ₃	tri-iodothyronine
T ₄	thyroxine
TAC	tetracaine, adrenaline and cocaine
TB	tuberculosis
tds	three times a day
TFTs	thyroid function tests
TIA	transient ischaemic attack
TIMI	thrombolysis in myocardial infarction
tPA	tissue plasminogen activator
TSH	thyroid stimulating hormone
u/U	unit(s)
U&E	urea and electrolytes
URTI	upper respiratory tract infection
USS	ultrasound scan
UTI	urinary tract infection
V	volts
VA	visual acuity
VF	ventricular fibrillation
VHF	viral hemorrhagic fever
V/Q	ventilation/perfusion (scan)
VT	ventricular tachycardia
WB	weight-bear(ing)
WBC	white blood cells
WCC	white cell count
WHO	World Health Organization
WPW	Wolff Parkinson White (syndrome)

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Normal values

Note that 'normal' values in adults may vary slightly between labs.

Normal values in pregnancy are shown in  The pregnant patient, p.576.

Arterial blood gas analysis

H ⁺	35–45 nanomol/L
pH	7.35–7.45
pO ₂ (on air)	>10.6 kPa, 75–100 mmHg
pCO ₂	4.5–6.0 kPa, 35–45 mmHg
bicarbonate	24–28 mmol/L
base excess	±2 mmol/L

Biochemistry

alanine aminotransferase (ALT)	5–35 iu/L
albumin	35–50 g/L
alkaline phosphatase	30–300 iu/L
amylase	0–180 Somogyi U/dL
aspartate transaminase (AST)	5–35 iu/L
bicarbonate	24–30 mmol/L
bilirubin	3–17 micromol/L
calcium (total)	2.12–2.65 mmol/L
calcium (ionized)	1–1.25 mmol/L
chloride	95–105 mmol/L
creatinine kinase (CK)	25–195 iu/L
creatinine	70–150 micromol/L
C-reactive protein (CRP)	<10 mg/L
glucose (fasting)	3.5–5.5 mmol/L
γ glutamyl transpeptidase (♂)	11–51 IU/L
(♀)	7–33 IU/L
magnesium	0.75–1.05 mmol/L
osmolality	278–305 mosmol/kg
potassium	3.5–5.0 mmol/L
sodium	135–145 mmol/L
urea	2.5–6.7 mmol/L
urate (♀)	150–390 micromol/L
(♂)	210–480 micromol/L

Haematology

RBC (women)	$3.9\text{--}5.6 \times 10^{12}/\text{L}$
(men)	$4.5\text{--}6.5 \times 10^{12}/\text{L}$
Hb (women)	11.5–16.0g/dL
(men)	13.5–18.0g/dL
Hct (women)	0.37–0.47
(men)	0.40–0.54
MCV	76–96 femtoL
WCC	$4.0\text{--}11.0 \times 10^9/\text{L}$
neutrophils	$2.0\text{--}7.5 \times 10^9/\text{L}$ (40–75% of WCC)
lymphocytes	$1.5\text{--}4.0 \times 10^9/\text{L}$ (20–40% of WCC)
monocytes	$0.2\text{--}0.8 \times 10^9/\text{L}$ (2–10% of WCC)
eosinophils	$0.04\text{--}0.40 \times 10^9/\text{L}$ (1–6% of WCC)
basophils	$<0.1 \times 10^9/\text{L}$ (<1% of WCC)
platelets	$150\text{--}400 \times 10^9/\text{L}$
prothrombin time (factors I, II, VII, X)	12–15sec
APTT (factors VII, IX, XI, XII)	23–42sec

International Normalized Ratio (INR) therapeutic targets

2.0–3.0	(for treating DVT, pulmonary embolism)
2.5–3.5	(embolism prophylaxis for AF)
3.0–4.5	(recurrent thrombo-embolic disease, arterial grafts & prosthetic valves)
ESR (women)	$< (\text{age in years} + 10)/2 \text{ mm/hr}$
(men)	$< (\text{age in years})/2 \text{ mm/hr}$

Metric conversion**Length**

1m = 3 feet 3.4 inches	1 foot = 0.3048m
1cm = 0.394 inch	1 inch = 25.4mm

Weight

1kg = 2.20 pounds	1 stone = 6.35kg
1g = 15.4 grains	1 pound = 0.454kg
	1 ounce = 28.4g

Volume

1 L = 1.76 UK pints = 2.11 US liquid pints
1 UK pint = 20 fluid ounces = 0.568 L
1 US liquid pint = 16 fluid ounces = 0.473 L
1 teaspoon \approx 5mL
1 tablespoon \approx 15mL

Temperature

$$T^{\circ} \text{ in } ^{\circ}\text{C} = (T^{\circ} \text{ in Fahrenheit} - 32) \times \frac{5}{9}$$

Pressure

$$1\text{kPa} = 7.5\text{mmHg}$$

Acknowledgements

A number of people provided comments, help and moral support. Special thanks are due to Dr Phil Munro. We also wish to thank:

Miss Sehlah Abassi, Mr David Alao, Dr Matt Baker, Dr Joan Barber, Dr Ruth Beach, Mr Dewald Behrens, Dr Ash Bhatia, Dr Angela Bonnar, Dr Rachel Broadley, Dr Chris Brown, Mrs Debra Clayton, Mr Jon Davies, Dr Kate Evans, Dr James Falconer, Miss Paula Fitzpatrick, Mrs Jennifer Flemen, Dr Adrian Flynn, Dr Debbie Galbraith, Mr Blair Graham, Dr Catherine Guly, Mr Chris Hadfield, Dr Steve Halford, Mr Andrew Harrower, Miss Emily Hotton, Mr Jim Huntley, Mrs Eileen Hutchison, Mr Nicholas Hyatt, Dr Karen Illingworth, Mr Ian Kelly, Mr Jacques Kerr, Dr Alastair Kidd, Dr Paul Leonard, Mr Malcolm Lewis, Mr AF Mabrook, Dr Simon Mardel, Dr Nick Mathiew, Ms Carolyn Meikle, Dr Louisa Mitchell, Dr Claudia Murton, Dr Louisa Pieterse, Dr Stephanie Prince, Dr Laura Robertson, Miss Katharine Robinson, Dr Andrew Sampson, Mr Tom Scott, Dr Simon Scott-Hayward, Ms Karen Sim, Mr Toby Slade, Dr Timothy Squires, Mr Ashleigh Stone, Dr Luke Summers, Dr Rob Taylor, Dr Ross Vanstone, Ms Fiona Wardlaw, Dr Mike Wells, Mr Ken Woodburn, Mrs Polly Wyatt.

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The emergency department

The role of the emergency department

The emergency department (ED) occupies a key position in terms of the interface between primary and secondary care. It has a high public profile. Many patients attend without referral, but some are referred by NHS Direct, minor injury units, general practitioners (GPs), and other medical practitioners. The ED manages patients with a huge variety of medical problems. Many of the patients who attend have painful and/or distressing disorders of recent origin.

Priorities are:

- To make life-saving interventions.
- To provide analgesia.
- To identify relevant issues, investigations, and commence treatment.
- To decide upon need for admission or discharge.

ED staff work as a team. Traditional roles are often blurred, with the important issue being what clinical skills a member of staff is capable of.

ED staff include:

- Nurses (including nurse practitioners, nurse consultants, health care assistants).
- Doctors (permanent and fixed-term).
- Reception and administrative staff (receptionists, secretaries, managers).
- Radiographers, including reporting radiographers.
- Other specialist staff (eg psychiatric liaison nurses, plaster technicians, physiotherapists, paramedic practitioners, physician assistants, occupational therapists, clinic/ED ward staff).
- Supporting staff (security, porters, cleaners, police).

Physical resources

A principal focus of the ED is to provide immediate resuscitation for patients who present with emergency conditions. In terms of sheer numbers, more patients attend with minor conditions and injuries, often presenting quite a challenge for them to be seen and treated in a timely fashion. Different departments have systems to suit their own particular needs, but most have a resuscitation room, an area for patients on trolleys, and an area for ambulant patients with less serious problems or injuries. Paediatric patients are seen in a separate area from adults. In addition, every ED requires facilities for applying casts, exploring and suturing wounds, obtaining X-rays, and examining patients with eye problems.

Discharge from the ED

To work efficiently, the overall hospital system needs to enable easy flow of patients out of the ED. Options available for continuing care of patients who leave the ED, include:

- Discharge home with no follow-up.
- Discharge home with GP and/or other community support/follow-up.
- Discharge with hospital clinic follow-up arranged.
- Admission to hospital for further investigation and treatment.
- Transfer to another hospital with more specialist facilities.

Emergency department staff beyond the emergency department

In addition to their roles in providing direct clinical care in their departments, many ED staff provide related clinical care in other settings and ways:

- *Short stay wards* (sometimes called clinical decision units) where emergency care can be continued by ED staff. The intention is for admissions to these units to be short: most of the patients admitted to such wards are observed for relatively short periods (<24hr) and undergo assessments at an early stage to decide about the need for discharge or longer-term admission.
- *Outpatient clinics* enable patients with a variety of clinical problems (eg burns, soft tissue injuries, and infections) to be followed up by ED staff.
- *Planned theatre lists* run by ED specialists are used by some hospitals to manage some simple fractures (eg angulated distal radial fractures).
- *Telemedicine advice* to satellite and minor injury units.

Emergency medicine in other settings

As the delivery of emergency care continues to develop, patients with emergency problems are now receiving assessment and treatment in a variety of settings. These include minor injury units, acute medical assessment units and walk-in centres. Traditional distinctions between emergency medicine, acute medicine, and primary care have become blurred.

Note keeping

General aspects

It is impossible to over-emphasize the importance of note keeping. Doctors and nurse practitioners each treat hundreds of patients every month. With the passage of time, it is impossible to remember all aspects relating to these cases, yet it may be necessary to give evidence in court about them years after the event. The only reference will be the notes made much earlier. Medicolegally, the ED record is the prime source of evidence in negligence cases. If the notes are deficient, it may not be feasible to defend a claim even if negligence has not occurred. A court may consider that the standard of the notes reflects the general standard of care. Sloppy, illegible, or incomplete notes reflect badly on the individual. In contrast, if notes are neat, legible, appropriate, and detailed, those reviewing the case will naturally expect the general standards of care, in terms of history taking, examination, and level of knowledge, to be competent.

The *Data Protection and Access to Medical Records Acts* give patients right of access to their medical notes. Remember, whenever writing notes, that the patient may in the future read exactly what has been written. Follow the basic general rules listed below.

Layout

Follow a standard outline:

Presenting complaint Indicate from whom the history has been obtained (eg the patient, a relative, or ambulance personnel). Avoid attributing events to certain individuals (eg patient was struck by 'Joe Bloggs').

Previous relevant history Note recent ED attendances. Include family and social history. An elderly woman with a Colles' fracture of her dominant hand may be able to manage at home with routine follow-up provided she is normally in good health, and has good family or other support, but if she lives alone in precarious social conditions without such support, then admission on 'social grounds' may be required.

Current medications Remember to ask about non-prescribed drugs (including recreational, herbal, and homeopathic). Women may not volunteer the oral contraceptive pill (OCP) as 'medication' unless specifically asked. Enquire about allergies to medications and document the nature of this reaction.

Examination findings As well as +ve features, document relevant -ve findings (eg the absence of neck stiffness in a patient with headache and pyrexia). Always document the side of the patient which has been injured. For upper limb injuries, note whether the patient is left or right handed. Use 'left' and 'right', not 'L' and 'R'. Document if a patient is abusive or aggressive, but avoid non-medical, judgemental terms (eg 'drunk').

Investigation findings Record clearly.

Working diagnosis For patients being admitted, this may be a differential diagnostic list. Sometimes a problem list can help.

Treatment given Document drugs, including dose, time, and route of administration (see current *British National Formulary (BNF)* for guidance). Include medications given in the ED, as well as therapy to be continued (eg course of antibiotics). Note the number and type of sutures or staples used for wound closure (eg '5 × 6/0 nylon sutures').

Advice and follow-up arrangements Document if the patient and/or relative is given preprinted instructions (eg 'POP care'). Indicate when/if the patient needs to be reviewed (eg 'see GP in 5 days for suture removal') or other arrangement (eg 'Fracture clinic in one week').

Record advice about when/why the patient should return for review, especially if there is a risk of a rare but serious complication (eg for low back pain 'see GP if not better in 1 week. Return to the ED at once if bladder/bowel problem or numb groin/bottom' that might be features of cauda equina syndrome).

Basic rules

- Write legibly in ballpoint pen, ideally black, which photocopies well.
- Always date and time the notes.
- Sign the notes, and print your name and status below.
- Make your notes concise and to the point.
- Use simple line drawings or preprinted sheets for wound/injury descriptions.
- Avoid idiosyncratic abbreviations.
- *Never* make rude or judgemental comments.
- *Always* document the name, grade, and specialty of any doctor from whom you have received advice.
- When referring or handing a patient over, *always* document the time of referral/handover, together with the name, grade, and specialty of the receiving doctor.
- Inform the GP by letter (📖 *Liaising with GPs*, p.10), even if the patient is admitted. Most EDs have computerized systems that generate such letters. In complex cases, send also a copy of ED notes, with results of investigations.

Pro formas

Increasing emphasis on evidence-based guidelines and protocols has been associated with the introduction of protocols for many patient presentations and conditions. Bear in mind the fact that, for some patients, satisfactory completion of a pro forma may not adequately capture all of the information required.

Electronic records

In an electronic age, there has been an understandable move towards trying to introduce electronic patient records. The potential advantages are obvious, particularly in relation to rapidly ascertaining past medical history. When completing electronic records, practitioners need to follow the same principles as those outlined above for written records.

Access to old records can make a huge contribution to decision making. One potential advantage of electronic records is that they can be accessed rapidly (compared with older systems requiring a porter to search through the medical records store and retrieve paper-based notes).


Radiological requests

'I am glad to say that in this country there is no need to carry out unnecessary tests as a form of insurance. It is not in this country desirable, or indeed necessary, that over protective and over examination work should be done, merely and purely and simply as I say to protect oneself against possible litigation'—Judge Fallon, quoted by Oscar Craig, Chairman Cases Committee, Medical Protection Society.

Requesting investigations

The Royal College of Radiologists' booklet *'Making the Best Use of a Department of Clinical Radiology: Guidelines for Doctors'* (6th edn, London, RCR, 2007) contains very useful information and is strongly recommended.

General aspects

- An X-ray is no substitute for careful, thorough clinical examination. It is usually unnecessary to request X-rays to confirm the clinical diagnosis of uncomplicated fractures of the nose, coccyx, a single rib, or toes (other than the big toe).
- If in doubt about the need for X-rays or the specific test required, consider relevant guidelines (eg Ottawa rules for ankle injuries,  p.484) and/or discuss with senior ED staff or radiologist.
- When requesting X-rays, describe the indication/mechanism of injury, clinical findings, including the side involved (right or left—spelt out in full, not abbreviated) and the suspected clinical diagnosis. This is important for the radiologist reporting the films without the advantage of being able to examine the patient.
- Do not worry about specifying exactly which X-ray views are required. The radiographer will know the standard views that are needed, based on the information provided (eg AP + simplified apical oblique views for a patient with suspected anterior shoulder dislocation). In unusual cases, discuss with senior ED staff, radiographer, or radiologist.
- Always consider the possibility of pregnancy in women of child-bearing age before requesting an X-ray of the abdomen, pelvis, lumbar spine, hips, or thighs. If the clinical indication for X-ray is overriding, tell the radiographer, who will attempt to shield the foetus/gonads. If the risks/benefits of X-rays in pregnant or possibly pregnant women are not obvious, consult senior ED or radiology staff.

X-ray reporting system

Many hospitals have systems so that all ED X-rays are reported by a specialist within 24hr. Reports of any missed abnormalities are returned with the X-rays to the ED for the attention of senior staff, so that appropriate action can be taken.

System for identifying abnormalities

In addition to the formal reporting system described above, a system is commonly used whereby the radiographer taking the films applies a sticky 'red dot' to hard copy X-ray films and/or request card or to the equivalent electronic image if they identify an abnormality. This alerts other clinical staff to the possibility of abnormal findings.

Triage

The nature of ED work means that a sorting system is required to ensure that patients with the most immediately life-threatening conditions are seen first. A triage process aims to categorize patients based on their medical need and the available departmental resources. One most commonly used process in the UK is the National Triage Scale (Table 1.1).

Table 1.1

National Triage Scale	Colour	Time to be seen by doctor
1 Immediate	Red	Immediately
2 Very urgent	Orange	Within 5–10 min
3 Urgent	Yellow	Within 1 hr
4 Standard	Green	Within 2 hr
5 Non-urgent	Blue	Within 4 hr

As soon as a patient arrives in the ED he/she should be assessed by a dedicated triage nurse (a senior, experienced individual with considerable common sense). This nurse should provide any immediate interventions needed (eg elevating injured limbs, applying ice packs or splints, and giving analgesia) and initiate investigations to speed the patient's journey through the department (eg ordering appropriate X-rays). Patients should not have to wait to be triaged. It is a brief assessment which should take no more than a few minutes.

Three points require emphasis:

- Triage is a dynamic process. The urgency (and hence triage category) with which a patient requires to be seen may change with time. For example a middle-aged man who hobbles in with an inversion ankle injury is likely to be placed in triage category 4 (green). If in the waiting room he becomes pale, sweaty, and complains of chest discomfort, he would require prompt re-triage into category 2 (orange).
- Placement in a triage category does not imply a diagnosis, or even the lethality of a condition (eg an elderly patient with colicky abdominal discomfort, vomiting, and absolute constipation would normally be placed in category 3 (yellow) and a possible diagnosis would be bowel obstruction). The cause may be a neoplasm which has already metastasized and is hence likely to be ultimately fatal.
- Triage has its own problems. In particular, patients in non-urgent categories may wait inordinately long periods of time, whilst patients who have presented later, but with conditions perceived to be more urgent, are seen before them. Patients need to be aware of this and to be informed of likely waiting times. Uncomplaining elderly patients can often be poorly served by the process.

Discharge, referral, and handover

Most patients seen in the ED are examined, investigated, treated, and discharged home, either with no follow-up, or advice to see their GP (for suture removal, wound checks, etc.). Give these patients (and/or attending relative/friend) clear instructions on when to attend the GP's surgery and an indication of the likely course of events, as well as any features that they should look out for to prompt them to seek medical help prior to this. *Formal written instructions* are particularly useful for patients with minor head injury (📖 p.367) and those with limbs in POP or other forms of cast immobilization (📖 Casts and their problems, p.424).

The referral of patients to an inpatient team can cause considerable anxiety, misunderstanding, and potential conflict between ED staff and other disciplines. Before making the referral the following should be considered.

Is it appropriate to refer this patient to the inpatient team?

Usually, this will be obvious. For example, a middle-aged man with a history of crushing chest pain and an ECG showing an acute MI clearly requires urgent management in the ED, and rapid admission for further investigation and treatment. Similarly, an elderly lady who has fallen, is unable to weight-bear and has a fractured neck of femur will require analgesia, inpatient care and surgery.

However, difficult situations occur where the clinical situation is less clear; for example, if a man experienced 4–5min of atypical chest pain, has a normal ECG and chest X-ray (CXR), and is anxious to go home. Or a lady has no apparent fracture on X-ray, but cannot weight-bear.

Is there appropriate information to make this decision?

This requires a balance between availability, time, and appropriateness. In general, simple investigations which rapidly give the diagnosis, or clues to it, are all that are needed. These include electrocardiogram (ECGs), arterial blood gas (ABG), and plain X-rays. It is relatively unusual to have to wait for the results of investigations such as full blood count (FBC), urea & electrolytes (U&E), and liver function tests (LFTs) before referring a patient, since these rarely alter the immediate management. Simple trolley-side investigations are often of great value, for example, stix estimations of blood glucose (BMG) and urinalysis. If complicated investigations are needed, then referral for inpatient or outpatient specialist care is often required.

Has the patient had appropriate treatment pending the admission?

Do not forget, or delay, analgesia. Treat every patient in pain appropriately as soon as possible. A patient does not have to 'earn' analgesia. Never delay analgesia to allow further examination or investigation. Concern regarding masking of signs or symptoms (for example, in a patient with an acute abdomen) is inhumane and incorrect.

How to refer patients

Referral is often by telephone, and this can create problems:

- Introduce yourself and ask for the name and grade of the specialist.
- Give a clear, concise summary of the history, investigations, and treatment that you have already undertaken.
- Early in the discussion say clearly whether you are making a referral for admission or a request for a specialist opinion. With ever increasing pressure on hospital beds, inpatient teams can be reluctant to come and see patients, and may appear to be happier to give advice over the phone to avoid admission. If, in your view, the patient needs to be admitted, then clearly indicate this. If, for whatever reason, this is declined, do not get cross, rude, or aggressive, but contact senior ED medical staff to speak to the specialist team.
- When the specialist team comes to see the patient, or the patient is admitted directly to a ward, the ED notes need to be complete and legible. Make sure that there is a list of the investigations already performed, together with the available results and crucially, a list of investigations whose results remain outstanding. The latter is essential to ensure continuity of care and to prevent an important result 'falling through the net'. Similarly, summarize treatment already given and the response. In an emergency, do not delay referral or treatment merely to complete the notes, but complete them at the earliest opportunity.
- Encourage inpatient specialists who attend patients to write their findings and management plan in the notes, adding a signature and the time/date.

Handing over patients

Dangers of handing over

Handing over a patient to a colleague, because your shift has ended and you are going home, is fraught with danger. It is easy for patients to be neglected, or receive sub-optimal or delayed treatment. It is safest to complete to the point of discharge or referral to an inpatient team every patient that you are seeing at the end of a shift. Occasionally this may not be possible (eg if there is a delay in obtaining an X-ray or other investigation). In these situations, hand over the patient carefully to the doctor who is taking over and inform the nursing staff of this.

How to hand over

Include in the handover relevant aspects of history and examination performed, the investigation results, and the treatment undertaken. Sign and aim to complete records on the patient as soon as possible. Note the time of hand over, and the name of the doctor or nurse handed over to. When accepting a 'handed-over patient' at the start of a shift, spend time establishing exactly what has happened so far. Finally, it is courteous (and will prevent problems) to tell the patient that their further care will be performed by another doctor or nurse.