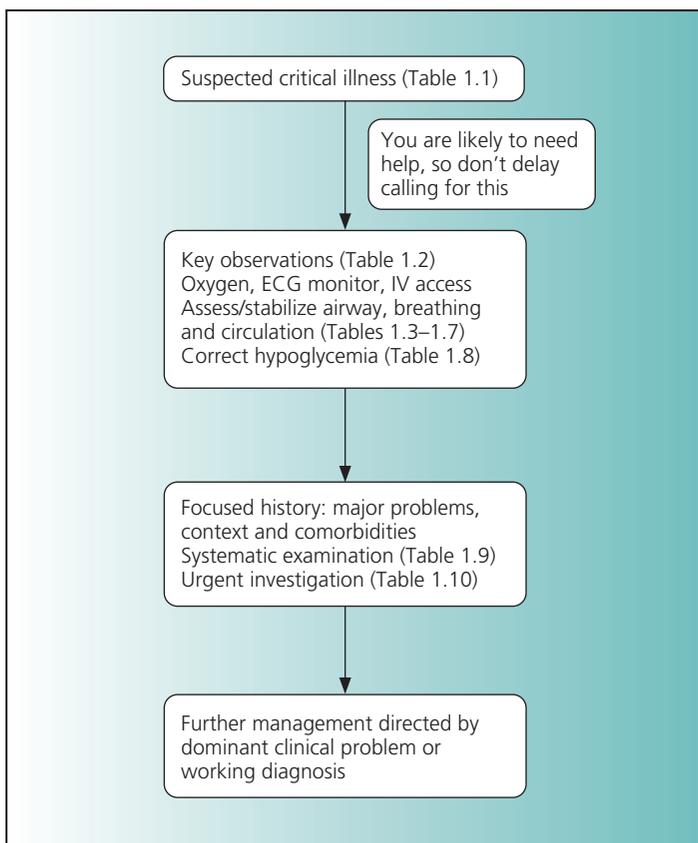


SECTION 1

# Common presentations



# 1 The critically ill patient: assessment and stabilization



4 COMMON PRESENTATIONS

**TABLE 1.1** Identification of patients with potential critical illness using the Early Warning Score

Score	3	2	1	0	1	2	3
<b>Respiratory rate (/min)</b>	<8	8–11	12–20	21–25	26–30	>30	
<b>Arterial oxygen saturation(%)</b>	<85	86–89	90–94	>95			
<b>Heart rate (/min)</b>	<40	41–50	51–100	101–110	111–130	>130	
<b>Systolic blood pressure (mmHg)</b>	<70	71–80	81–100	101–179	180–199	200–220	>220
<b>Temperature (°C)</b>	<35	35.1–36.5	36.6–37.4	>37.5			
<b>Neurological status</b>		New confusion	Alert	Alert	Responds to voice	Responds to pain	Unresponsive

A score of 3 or more suggests potential critical illness and requires immediate assessment. The score is a guide and has not been fully validated.

**TABLE 1.2** Nine key observations in suspected critical illness

Observation	Signs of critical illness	Action
<b>1 Airway</b>	Evidence of upper airway obstruction	See Table 1.3 and pp. 245–52 for management of the airway
<b>2 Respiratory rate</b>	Respiratory rate <8 or >30/min	Give oxygen (initially 60–100%) Check arterial oxygen saturation and blood gases (pp. 98–103, 587) See Table 1.5; pp. 104–9 for management of respiratory failure
<b>3 Arterial oxygen saturation</b>	Arterial oxygen saturation <90%	Give oxygen (initially 60–100% if there are other signs of critical illness) Check arterial blood gases (pp. 587, 98–103)
<b>4 Heart rate</b>	Heart rate <40 or >130bpm	Give oxygen 60–100% Connect an ECG monitor and obtain IV access See p. 18 for management of cardiac arrhythmia
<b>5 Blood pressure</b>	Systolic BP <90 mmHg, or fall in systolic BP by more than 40 mmHg with signs of impaired perfusion	Give oxygen 60–100% Connect an ECG monitor and obtain IV access See p. 53 for management of hypotension/impaired perfusion

*Continued*

## 6 COMMON PRESENTATIONS

The critically ill patient: assessment and stabilization

Observation	Signs of critical illness	Action
<b>6 Perfusion</b>	Signs of reduced organ perfusion: cool/mottled skin with capillary refill time >2 s; agitation/reduced conscious level; oliguria (urine output <30 ml/h)	Give oxygen 60–100% Connect an ECG monitor and obtain IV access See p. 53 for management of hypotension/ impaired perfusion
<b>7 Conscious level</b>	Reduced conscious level (unresponsive to voice)	Stabilize airway, breathing and circulation Endotracheal intubation if GCS 8 or less Exclude/correct hypoglycemia Give naloxone if opioid poisoning is possible (respiratory rate <12/min, pinpoint pupils) (see Table 11.2) See pp. 118–25 for management of the unconscious patient
<b>8 Temperature</b>	Core temperature <36 or >38°C, with hypotension, hypoxemia, oliguria or confusional state	See pp. 59–65 for management of sepsis
<b>9 Blood glucose</b>	Blood glucose <3.5 mmol/l, with signs of hypoglycemia (sweating, tachycardia, abnormal behavior, reduced conscious level or fits)	Give 50 ml of 50% glucose IV via a large vein (or 500 ml of 5% glucose IV over 15–30 min) or glucagon 1 mg IV/IM/SC Recheck blood glucose after 5 min and again after 30 min. See p. 10

GCS, Glasgow Coma Scale score (see p. 297).

**TABLE 1.3** Assessment and stabilization of the airway

	<b>Signs of acute upper airway obstruction</b>	<b>Causes of acute upper airway obstruction</b>	<b>Action if you suspect upper airway obstruction</b>
<b>Conscious patient</b>	Respiratory distress* Inspiratory stridor Suprasternal retraction Abnormal voice Coughing/choking	Foreign body Anaphylaxis Angioedema	Sit the patient up Give high-flow oxygen Call for urgent help from an anesthetist and ENT surgeon
<b>Unconscious patient</b>	Respiratory arrest Inspiratory stridor Gurgling Grunting/snoring	Above causes Tongue and soft tissues of oropharynx Inhalation of foreign body, secretions, blood, vomitus	Head-tilt/chin-lift maneuver (p. 249) Remove dentures (if loose) and aspirate the pharynx, larynx and trachea with a suction catheter Call for urgent help from an anesthetist Before intubation, ventilate the patient using a bag-mask device with 100% oxygen
* Respiratory distress is shown by dyspnea, tachypnea, inability to speak only in short sentences or single words, agitation and sweating.			

**TABLE 1.4** Assessment of breathing

- Conscious level, mental state and speech
- Respiratory rate and pattern
- Arterial oxygen saturation
- Depth and symmetry of chest expansion
- Accessory muscles of respiration active?
- Volume of secretions?
- Tracheal position
- Signs of pleural effusion?
- Signs of pneumothorax?
- Focal/generalized wheeze?
- Focal/generalized crackles?

**ALERT**

Pulse oximetry can give an inaccurate reading of arterial oxygen saturation (see Table 15.3): always check arterial blood gases if in doubt.

**TABLE 1.5** Management of respiratory failure (impaired oxygenation and/or ventilation): general principles

- Maintain patent airway (pp. 245–9)
- Increase inspired oxygen concentration if needed to achieve arterial oxygen saturation >90% (>88% in acute exacerbation of COPD)
- Diagnose and treat underlying cause and contributory factors (see Table 16.3)
- If feasible, sit the patient up to improve diaphragmatic descent and increase tidal volume
- Clear secretions: encourage cough, physiotherapy, aspiration
- Drain large pleural effusion if present
- Drain pneumothorax if present (Table 43.3; p. 619)
- Optimize cardiac output: treat hypotension and heart failure (Table 1.7)
- Consider ventilatory support (p. 108)

COPD, chronic obstructive pulmonary disease.

**TABLE 1.6** Assessment of the circulation

- Conscious level and mental state
- Heart rate
- Cardiac rhythm by ECG monitor
- Blood pressure
- Skin color, temperature and sweating
- Capillary refill time: squeeze the finger pulp, held at the level of the heart, for 5s and then release: a capillary refill time of >2s is abnormal
- Jugular venous pressure
- Auscultation: added heart sounds, murmurs or pericardial rub?
- Major pulses: present and symmetrical?
- Signs of pulmonary and/or peripheral edema?

**TABLE 1.7** Management of circulatory failure: general principles

- Stabilize airway and breathing: maintain arterial oxygen saturation >90%
- Correct major arrhythmia (p. 18)
- Fluid resuscitation to correct hypovolemia (e.g. from acute blood loss (pp. 367–9) or severe sepsis (p. 63))
- Consider/exclude tension pneumothorax (p. 282) and cardiac tamponade (p. 216)
- Use inotropic vasopressor agent if there is pulmonary edema, or refractory hypotension despite fluid resuscitation (see Table 9.5)
- Diagnose and treat underlying cause (pp. 53–4, 178–9)
- Correct major metabolic abnormalities (e.g. derangements of electrolytes or blood glucose) (see Table 1.8)

**TABLE 1.8** Management of hypoglycemia

- 1** If the patient is drowsy or fitting (this may sometimes occur with mild hypoglycemia, especially in young diabetic patients):
  - Give 50 ml of 50% glucose IV via a large vein (if not available give 250 ml of 10% glucose over 15–30 min) or glucagon 1 mg IV/IM/SC
  - Recheck blood glucose after 5 min and again after 30 min
  - In patients with chronic alcohol abuse, there is a remote risk of precipitating Wernicke's encephalopathy by a glucose load; prevent this by giving thiamine 100 mg IV before or shortly after glucose administration
- 2** Identify and treat the cause (pp. 423–4)
- 3** If hypoglycemia recurs or is likely to recur (e.g. liver disease, sepsis, excess sulfonylurea):
  - Start an IV infusion of glucose 10% at 1 litre 12-hourly via a central or large peripheral vein
  - Adjust the rate to keep the blood glucose level at 5–10 mmol/L
  - After excess sulfonylurea therapy, maintain the glucose infusion for 24 h
- 4** If hypoglycemia is only partially responsive to glucose 10% infusion:
  - Give glucose 20% IV via a central vein
  - If the cause is intentional insulin overdose, consider local excision of the injection site

**TABLE 1.9** Systematic examination of the critically ill patient

Site	Check list
<b>Central nervous system (pp. 293–302)</b>	<p>Conscious level and mental state</p> <p>Pupils: size, symmetry, response to light (p. 121)</p> <p>Fundi</p> <p>Lateralized weakness?</p> <p>Tendon reflexes and plantar responses</p>
<b>Head and neck</b>	<p>Neck stiffness?</p> <p>Jaundice/pallor?</p> <p>Jugular venous pressure</p> <p>Central venous cannula?</p> <p>Mouth, teeth and sinuses</p> <p>Lymphadenopathy?</p>
<b>Chest</b>	<p>Focal lung crackles/bronchial breathing?</p> <p>Pleural/pericardial rub?</p> <p>Heart murmur?</p> <p>Prosthetic heart valve?</p> <p>Pacemaker/ICD?</p>
<b>Abdomen and pelvis</b>	<p>Vomiting/diarrhea?</p> <p>Distension?</p> <p>Ascites?</p> <p>Tenderness/guarding?</p> <p>Bladder catheter?</p> <p>Perineal/perianal abscess?</p>
<b>Limbs</b>	<p>Acute arthritis?</p> <p>Prosthetic joint?</p> <p>Abscess?</p>
<b>Skin</b>	<p>Cold/flushed/sweating?</p> <p>Rash/purpura?</p> <p>Pressure ulcer/cellulitis?</p> <p>IV cannula/tunneled line?</p>
ICD, implantable cardioverter-fibrillator.	

**TABLE 1.10** Investigation of the critically ill patient**Immediate**

- Arterial blood gases and pH
- ECG
- Blood glucose
- Sodium, potassium and creatinine
- Full blood count

**Urgent**

- Chest X-ray
- Cranial CT if reduced conscious level or focal signs
- Coagulation screen if low platelet count, suspected coagulation disorder, jaundice or purpura
- Biochemical profile
- Amylase if abdominal pain or tenderness
- C-reactive protein
- Blood culture if suspected sepsis
- Urine stick test
- Toxicology screen (serum 10ml and urine 50ml) if suspected poisoning

**Further reading**

Andrews FJ, Nolan JP. Critical care in the emergency department: monitoring the critically ill patient. *Emerg Med J* 2006; 23: 561–4.

Bion JF, Heffner JE. Challenges in the care of the acutely ill. *Lancet* 2004; 363: 970–77.

Reilly B. Physical examination in the care of medical inpatients: an observational study. *Lancet* 2003; 362: 100–5.