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ABCDE: Assessment and treatment of the acutely ill patient

Box 1.1 ABCDE assessment

A	Airway
B	Breathing
C	Circulation
D	Disability
E	Exposure

ABCDE approach: Guiding principles

- Undertake a complete initial ABCDE assessment (Box 1.1); reassess regularly
- Treat life-threatening problems first, before proceeding to the next part of assessment.
- Evaluate the effects of treatment and/or other interventions
- Recognise the circumstances when additional help is required
- Ensure effective communication
- Call for help early (SBAR) (Box 1.2)

Box 1.2 SBAR: Structured approach to calling for help

S	Situation
B	Background
A	Assessment
R	Recommendation

Initial approach

Safety

- Ensure safe approach: check the environment and remove any hazards
- Take measures to minimise the risk of cross infection

Simple question

- Ask the patient a simple question, e.g. 'How are you, sir?' If there is a normal verbal response the patient has a patent airway, is breathing, and has cerebral perfusion. If the patient can only speak in short sentences, they may have extreme respiratory distress, and failure to respond is a clear indicator of serious illness. If there is an inappropriate response or if there is no response, the patient may be acutely ill



NB If the patient is unconscious: summon help from colleagues immediately.

General appearance

- Note the general appearance of the patient, e.g. comfortable or distressed, content or concerned, colour and posture

Vital signs monitoring

- Attach vital signs monitoring, e.g. pulse oximetry, electrocardiogram (ECG) and continuous non-invasive blood pressure (BP) monitoring

Airway

- Patient talking: there is a patent airway
- Complete airway obstruction: there are no breath sounds at the mouth or nose
- Partial airway obstruction: air entry diminished, often noisy breathing

Look

- Look for the signs of airway obstruction, e.g. paradoxical chest and abdominal movements ('see-saw' respirations); central cyanosis is a late sign of airway obstruction

Listen

- Gurgling: fluid in the mouth or upper airway
- Snoring: tongue partially obstructing the pharynx
- Crowing: laryngeal spasm

- Inspiratory stridor: 'croaking respirations' indicating partial upper airway obstruction, e.g. foreign body, laryngeal oedema
- Expiratory wheeze: noisy musical sound caused by turbulent flow of air through narrowed bronchi and bronchioles, more pronounced on expiration; causes include asthma and chronic obstructive pulmonary disease (COPD)

Feel

- Feel for signs of airway obstruction. Place your face or hand in front of the patient's mouth to determine whether there is movement of air

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Causes of airway obstruction

- ✓ Tongue: commonest cause of airway obstruction in a semi-conscious or unconscious patient – relaxation of the muscles supporting the tongue can result in it falling back and blocking the pharynx
- ✓ Vomit, blood, and secretions
- ✓ Foreign body
- ✓ Tissue swelling: causes include anaphylaxis, trauma, or infection
- ✓ Laryngeal oedema (due to burns, inflammation, or allergy occurring at the level of the larynx)
- ✓ Laryngeal spasm (due to foreign body, airway stimulation, or secretions/blood in the airway)
- ✓ Tracheobronchial obstruction (due to aspiration of gastric contents, secretions, pulmonary oedema fluid, or bronchospasm)

Treatment of airway obstruction

- If airway obstruction is identified, treat appropriately; for example suction, lateral position, and insertion of oropharyngeal airway are often effective
- Administer oxygen 15 l min^{-1} via a non-rebreathe oxygen mask as appropriate
- If necessary, call for help early (SBAR)

Breathing

Inspect

- Look for signs of respiratory distress: tachypnoea, sweating, central cyanosis, use of the accessory muscles of respiration, abdominal breathing, and posture (e.g. pyramid position)

- Count the respiratory rate (normal respiratory rate in adults is approximately 12–20 min⁻¹): tachypnoea is often the first sign that the patient is becoming acutely ill and causes include pneumonia, pulmonary embolism (PE), heart failure, and shock; bradypnoea is an ominous sign and possible causes include drugs, opiates, fatigue, hypothermia, head injury, and central nervous system (CNS) depression

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Causes of tachypnoea

- ✓ Respiratory pathology, e.g. acute asthma attack, PE
- ✓ Heart failure
- ✓ Acidosis
- ✓ Normal physiological response, e.g. exercise

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Causes of bradypnoea

- ✓ Medications, e.g. opiates
- ✓ Head injury
- ✓ CNS depression
- ✓ Hypothermia

- Assess the depth of breathing. Ascertain whether chest movement is equal on both sides. Unilateral movement of the chest suggests unilateral disease, e.g. pneumothorax, pneumonia, or pleural effusion. Kussmaul's breathing (air hunger) is characterised by deep, rapid respirations due to stimulation of the respiratory centre by metabolic acidosis, e.g. in ketoacidosis and chronic renal failure.
- Assess the pattern (rhythm) of breathing. A Cheyne–Stokes breathing pattern (periods of apnoea alternating with periods of hyperpnoea) can be associated with brainstem ischaemia, cerebral injury, and severe left ventricular failure (altered carbon dioxide sensitivity of the respiratory centre)
- Note the presence of any chest deformity, e.g. kyphosis, as this could increase the risk of deterioration in the patient's ability to breathe normally

- If the patient has a chest drain, check it is patent and functioning effectively
- Note the presence of abdominal distension (could limit diaphragmatic movement, thereby exacerbating respiratory distress)
- Note the oxygen saturation (SaO_2) reading (normal is 94–100%); in a COPD patient normal can be 88–92%
- Check the inspired oxygen concentration (%) being administered to the patient; adjust if necessary



Common misinterpretations and pitfalls

Pulse oximetry does not detect hypercapnia and that, if the patient is receiving oxygen therapy, the SaO_2 may be normal in the presence of a very high PaCO_2 .

Palpate

- Check chest expansion
- Palpate the chest wall to detect surgical emphysema or crepitus (suggesting a pneumothorax until proven otherwise)
- Perform chest percussion

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Causes of different percussion notes

- ✓ *Resonant*: air-filled lung
- ✓ *Dull*: liver, spleen, heart, lung consolidation/collapse
- ✓ *Stoney dull*: pleural effusion/thickening
- ✓ *Hyper-resonant*: pneumothorax, emphysema
- ✓ *Tympanic*: gas-filled viscus

- Check the position of the trachea. Place the tip of your index finger into the suprasternal notch, let it slip either side of the trachea and determine whether it fits more easily into one or other side of the trachea; deviation of the trachea to one side indicates mediastinal shift (e.g. pneumothorax, lung fibrosis, pleural fluid)

Auscultate

- Auscultate the chest: assess the depth of breathing and the equality of breath sounds on both sides of the chest. Any additional sounds, e.g. crackles, wheeze, and pleural rubs should be noted. Bronchial breathing indicates lung consolidation; absent or reduced sounds suggest a pneumothorax or pleural fluid

Assessing efficacy of breathing, work of breathing, and adequacy of ventilation

- *Efficacy of breathing*: can be assessed by air entry, chest movement, pulse oximetry, arterial blood gas analysis, and capnography
- *Work of breathing*: can be assessed by respiratory rate and accessory muscle use, e.g. neck and abdominal muscles
- *Adequacy of ventilation*: can be assessed by heart rate, skin colour, and mental status

Causes of compromised breathing

Causes of compromised breathing include:

- Respiratory illness, e.g. asthma, COPD, pneumonia
- Lung pathology, e.g. pneumothorax
- Pulmonary embolism
- Pulmonary oedema
- CNS depression
- Drug-induced respiratory depression

Treatment of compromised breathing

- Position patient appropriately (usually in an upright position)
- Administer oxygen 15 l min^{-1} via a non-rebreathe oxygen mask if required and appropriate
- If possible treat the underlying cause
- If necessary, call for help early (SBAR)

Circulation



NB In most medical and surgical emergencies, if shock is present, treat for hypovolaemic shock until proven otherwise: administer IV fluid challenge to all patients who have tachycardia and cool peripheries, unless the cause of the circulatory shock is obviously cardiac (cardiogenic shock).

Inspect

- Look at the colour of the hands and fingers. Signs of cardiovascular compromise include cool and pale peripheries
- Measure the capillary refill time (CRT). A prolonged CRT (>2seconds) could indicate poor peripheral perfusion, although other factors, e.g. cool ambient temperature, poor lighting, and old age can also do this
- Note any other signs suggesting poor cardiac output, e.g. reduced conscious level and, if the patient has a urinary catheter, oliguria (urine volume <0.5mlkg⁻¹ h⁻¹)
- Examine the patient for signs of external haemorrhage from wounds or drains or evidence of internal haemorrhage. Concealed blood loss can be significant, even if drains are empty

Palpate

- Assess the skin temperature of the patient's limbs to determine whether they are warm or cool, the latter suggesting poor peripheral perfusion
- Palpate peripheral and central pulses. Assess for presence, rate, quality, regularity, and equality; a thready pulse suggests a poor cardiac output, whilst a bounding pulse may indicate sepsis
- Assess the state of the veins: if hypovolaemia is present the veins could be underfilled or collapsed
- Check the BP: a low systolic BP suggests shock. However, even in shock, the BP can still be normal as compensatory mechanisms increase peripheral resistance in response to reduced cardiac output. A low diastolic BP suggests arterial vasodilation (e.g. anaphylaxis or sepsis). A narrowed pulse pressure – i.e. the difference between systolic and diastolic pressures (normal pulse pressure is 35–45mmHg) – suggests arterial vasoconstriction (e.g. cardiogenic shock or hypovolaemia)

Auscultate

- Auscultate the heart

Monitoring

- Commence ECG monitoring
- Arrange for a 12 lead ECG

Causes of circulatory compromise

Causes of circulatory problems include:

- Acute coronary syndrome
- Cardiac arrhythmias
- Shock, e.g. hypovolaemia, septic and anaphylactic shock

- Heart failure
- Pulmonary embolism

Treatment of circulatory compromise

- The specific treatment required for circulatory compromise will depend on the cause; fluid replacement, haemorrhage control, and restoration of tissue perfusion will usually be necessary

Acute coronary syndromes (Box 1.3)

Box 1.3 Acute coronary syndromes

- Unstable angina
 - Non-ST-segment-elevation myocardial infarction (NSTEMI)
 - ST-segment-elevation myocardial infarction (STEMI)
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- If necessary, call for help early (SBAR)
 - Assist patient into a comfortable position (usually semi-recumbent position)
 - Commence oxygen saturation monitoring and if necessary administer oxygen to achieve an arterial blood oxygen saturation of 94–98% (88–92% in COPD patients)
 - Administer aspirin 300mg orally crushed or chewed (if no known allergy to aspirin)
 - Administer glyceryl trinitrate (GTN) sublingually
 - Administer analgesia, e.g. morphine (diamorphine) IV and titrate to control symptoms (avoid sedation and respiratory depression)
 - Consider the need for an antiemetic
 - Consider reperfusion therapy, e.g. percutaneous coronary intervention (For further information see Chapter 13)

Hypovolaemic shock

- Assist patient into a comfortable position (usually supine)
- Ensure open airway and administer oxygen 15l via a non-rebreathe mask
- Insert a large bore cannula (12–14G) and commence IV fluid challenge (500ml stat) (a second large bore cannula may be required)
- Regularly (every 5 minutes) reassess the patient; repeat the fluid challenge if there is no improvement
- If there are symptoms of heart failure (dyspnoea, increased heart rate, raised jugular venous pressure, pulmonary crackles on chest auscultation,

and/or third heart sound) develop, reduce, or stop IV fluid therapy. Seek expert advice concerning alternative treatments to improve tissue perfusion, e.g. inotropes or vasopressors

- Call for help early (SBAR)
- If possible, identify and treat the underlying cause
(For further information see Chapter 10)

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Rapid fluid challenge (over 5–10 minutes)

- ✓ *Normtensive*: 500 ml of warmed crystalloid, e.g. Hartmann's solution or 0.9% sodium chloride
- ✓ *Hypotensive*: 1000 ml of warmed crystalloid, e.g. Hartmann's solution or 0.9% sodium chloride
- ✓ *Known cardiac failure*: 250 ml of warmed crystalloid, e.g. Hartmann's solution or 0.9% sodium chloride and closely monitor patient (auscultate chest for crackles and consider central venous pressure (CVP) line)

Disability

- Evaluate CNS function
- Undertake a rapid assessment of the patient's level of conscious using AVPU (Box 1.4) and, if necessary (e.g. head injury), the Glasgow coma score (GCS)

Box 1.4 AVPU assessment of level of consciousness

A	Alert
V	Voice (responds to)
P	Pain (responds to)
U	Unresponsive

- Review ABC to exclude hypoxaemia and hypotension
- Check the patient's drug chart for reversible drug-induced causes of altered conscious level

- Undertake bedside glucose measurement to exclude hypoglycaemia
- Examine the pupils (size, equality, reaction to light, and consensual reaction)



NB Altered level of consciousness is the most common underlying cause of a compromised airway in the healthcare setting.

Causes of altered conscious level

Causes of altered conscious level include:

- Severe hypoxia
- Poor cerebral perfusion
- Drugs, e.g. sedatives, opiates
- Cerebral pathology
- Hypercapnia
- Hypoglycaemia
- Alcohol

Treatment of altered conscious level

- Undertake ABC assessment (as earlier in chapter) and exclude or treat hypoxia and hypotension
- If drug-induced altered conscious level is suspected and the effects are reversible, consider an antidote, e.g. naloxone, which can be used with caution for opiate toxicity
- Administer glucose if hypoglycaemia is suspected or confirmed
- Ensure the patient's airway is maintained: consider placing the patient in the lateral (recovery) position
- If necessary, call for help early (SBAR)

Exposure

- Fully expose the patient and undertake a thorough examination and ensure important details are not missed
- In particular, examine the part of the body which is most likely contributing to the patient's ill status, e.g. in suspected anaphylaxis, examine the skin for urticaria
- Maintain the patient's dignity and minimise heat loss

In addition:

- Undertake a full clinical history

- Review the patient's case notes, observations chart, and medications chart
- Study the recorded vital signs: trends are more significant than one-off recordings
- Ensure that prescribed medications are being administered
- Review the results of laboratory, ECG, and radiological investigations
- Consider the level of care the patient requires (e.g. ward, high dependency unit, intensive care unit)
- Record in the patient's case notes any details of assessment, treatment, and response to treatment
- Call for senior help if necessary (SBAR)

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Minimising the risk of cross infection

- ✓ Decontaminate hands with an alcohol-based handrub between caring for different patients and between different care activities for the same patient
- ✓ If hands are visibly soiled, or potentially grossly contaminated with dirt or organic material, wash with liquid soap and water
- ✓ Before regular hand decontamination begins, all wrist and ideally hand jewellery should be removed
- ✓ Cover cuts and abrasions with waterproof dressings
- ✓ Ensure fingernails are kept short, clean, and free from nail polish

