Resuscitation and preparation for anaesthesia and surgery

Key Points
The emergency measures that are familiar to most of us are:

- **A** Airway
- **B** Breathing
- **C** Circulation

To manage a collapsed patient:

- Keep calm
- Use ABC principles for immediate treatment
- Think about and treat the underlying cause.
13.1 MANAGEMENT OF EMERGENCIES AND CARDIOPULMONARY RESUSCITATION

Cardiac Arrest And Inadequate Circulation

• In emergencies: look – feel – listen.

• In cardiac arrest, keep ventilating and continue ECM until there is a response or you decide to stop treatment.

• At this stage, you are temporarily averting the fatal consequences of cardiopulmonary arrest.

• The ABC routine is life saving, but only for a few minutes. Some other treatment must be given and normal circulation must be restored if the patient is to survive.

• Do not waste time during a cardiac arrest trying to make an ECG machine work.
13.1 MANAGEMENT OF EMERGENCIES AND CARDIOPULMONARY RESUSCITATION

CARDIAC ARREST AND INADEQUATE CIRCULATION

Figure 13.1
13.1 MANAGEMENT OF EMERGENCIES AND CARDIOPULMONARY RESUSCITATION

• When there is no ECG diagnosis

  – Epinephrine (adrenaline) is life saving in many cases of cardiac arrest.

  – Always use it once the diagnosis is made, even if you do not know the cause of the arrest.
13.1 MANAGEMENT OF EMERGENCIES AND CARDIOPULMONARY RESUSCITATION

Ventricular fibrillation

- Nodal rhythm
- Atrial fibrillation
- Pulsus bigeminus: alternate ventricular ectopics
- Multi-focal ventricular ectopics
- Ventricular fibrillation

Figure 13.3
• Recognize shock by:
  – Tachycardia (may be the only sign in a child)
  – Thready pulse
  – Narrow pulse pressure: e.g. 110/70 becomes 95/75
  – Cold hands and feet
  – Sweating, anxious patient
  – Breathlessness and hyperventilation
  – Confusion leading to unconsciousness.

• There may be more than one cause of shock. In surgical patients, look for hypovolaemia and sepsis first.
13.1 MANAGEMENT OF EMERGENCIES AND CARDIOPULMONARY RESUSCITATION

Unconsciousness

Monitor the airway and await progress and diagnosis
13.2 OTHER CONDITIONS REQUIRING URGENT ATTENTION

ANAEMIA

• A critical haemoglobin concentration is 4 g/dl, below which significant reduction in oxygen consumption starts to occur.

• Blood transfusion is mandatory in all such cases.
13.3 INTRAVENOUS ACCESS

- Develop the attitude: ‘There is a vein in there. I must find it’

- There is almost no emergency case that can survive without a drip.

- How To Find A Vein
  - When access is difficult, make sure you have a good light and an assistant to help you.
  
  - Ideally, an intravenous cannula should be placed in a vein in the arm that is not over a joint and where fixation is easy, comfortable for the patient and convenient for drug administration and care of the IV site.

  - In shocked patients, such veins may be hard to find.
13.3 INTRAVENOUS ACCESS contd.

- Often the best veins to use in emergencies are:
  - Antecubital fossa
  - Femoral vein
  - Internal jugular vein.

- Do not attempt the subclavian vein as there is a high risk of pleural puncture.
13.3 INTRAVENOUS ACCESS

Femoral vein

- If you are right handed, it is easiest to stand on the patient’s right and use your left index and middle fingers to palpate the femoral artery.
- Use a 14, 16 or 18 G (20 G in a child) cannula mounted on a 5 ml syringe.
13.3 INTRAVENOUS ACCESS

Internal jugular vein

• Use of the internal jugular vein may be life saving, but serious complications can occur, including air embolism, damage to structures in neck and pneumothorax.

• Remove the IV line as soon as an alternative is available.

• Cannulation of a big central vein is useful for emergencies, but poses more hazards for the patient than a peripheral vein.
13.3 INTRAVENOUS ACCESS

- The internal jugular vein is the most popular vein to choose in severe shock and CPR as well as for elective major surgery.
- Two approaches are possible:

  - Mid sternomastoid (upper)
  - Sternomastoid triangle (lower)
13.3 INTRAVENOUS ACCESS

Venous cutdown

Intraosseous puncture
13.4 FLUIDS AND DRUGS

- Always try to calculate the volume and type of fluids lost
- Replace with fluids of a similar volume and composition
- Add the patient's daily maintenance requirements to the fluid needed to replace losses to make the total daily requirement
- Watch carefully for a response to your fluid regime and modify it, if necessary.
13.4 FLUIDS AND DRUGS

- Every patient responds differently to fluid therapy.
- Look for the difference.
- Avoid fluids containing dextrose during resuscitation.
- Monitor the response by looking at the vital signs and urine output.
- Whole blood transfusion is the ultimate life saving treatment for haemorrhagic shock.
13.4 FLUIDS AND DRUGS

Paediatric Fluids

- In emergency paediatric resuscitation, it is customary to give a fluid bolus of normal saline (20 ml/kg body weight and repeat if needed) as initial therapy as soon as the drip is in place.

- Events happen quickly in babies. Monitor closely.
13.4 FLUIDS AND DRUGS

Speed Of Intravenous Fluid Therapy

• As with inadequate volumes of infusion, it is common that shocked patients receive their fluids too slowly.

• A slow running drip overnight is the commonest reason for a dead patient in the morning.
What Blood Pressure Should You Aim For?

- In severe haemorrhage, control of bleeding is the first priority, whatever the blood pressure or haemoglobin.
13.5 DRUGS IN RESUSCITATION

- Always give drugs intravenously during resuscitation

- Most drugs are only helpful once the cause of cardiac arrest has been diagnosed, but epinephrine is an exception and should always be given to patients with circulatory arrest.

- Epinephrine saves lives in cases of acute collapse.
13.6 PREOPERATIVE ASSESSMENT AND INVESTIGATIONS

- Always take a history – if the patient cannot tell you, someone else may be able to

- Make a rapid evaluation of a collapsed patient

- Follow this with a full and detailed examination to avoid missing out anything important.
13.6 PREOPERATIVE ASSESSMENT AND INVESTIGATIONS

Initial Assessment

- The events leading up to admission should be carefully considered: for example, following an accident:
  - When did it happen?
  - What happened?
  - Was the patient a passenger, driver or pedestrian?
  - Is there any blood loss?
  - How far away did it occur?
  - How did the victim get to hospital?
  - If unconscious now, was the patient conscious before?
• Before starting the clinical examination, make an “end-of-the-bed” examination of such signs as:
  – Breathing pattern (flail segment, asymmetrical or paradoxical movement, tachypnoea, dyspnoea)
  – Position of patient (sitting up or lying down)
  – Position of arms and legs (showing limb or pelvic fracture)
  – Restlessness, such as from pain, hypoxia or shock
  – Dehydration (skin turgor, sunken eyes)
  – Distended abdomen
  – Scars of recent surgery or dressings covering a wound that has not been inspected
  – Blood stained clothes.
• Before starting any case, ask yourself: “Have I missed anything out?”

• Ask: “Will the investigation be useful?”

• Talk to your surgical colleague to make sure you each know what the other will do.

• However strong the indications may seem for using a particular technique, the best anaesthetic technique, especially in an emergency, will normally be one with which you are experienced and confident.
13.7 ANAESTHETIC ISSUES IN THE EMERGENCY SITUATION

- Choose a suitable anaesthetic technique that fits in with the patient’s condition, the needs of the surgeon and your own experience and skill.

- Most cases in district hospitals are full-stomach emergencies, so general anaesthesia will normally require protection of the lungs with a tracheal tube.
13.7 ANAESTHETIC ISSUES IN THE EMERGENCY SITUATION

• It is a dangerous mistake to think that conduction anaesthesia is always safe.

• Never start a case if you are alone with the patient in the operating room.

• If in doubt about the regurgitation risk, apply cricoid pressure – it costs nothing and may save a life.
13.7 ANAESTHETIC ISSUES IN THE EMERGENCY SITUATION

Figure 13.12
13.7 ANAESTHETIC ISSUES IN THE EMERGENCY SITUATION

- Where facilities for anaesthesia are limited, ventilators often do not have alarms to warn about disconnection and trained, experienced anaesthetists are not available.

- Emergency surgery under general anaesthesia in these conditions is safer when performed with the patient breathing spontaneously.

- Use a rigid sucker for emergencies.
13.8 IMPORTANT MEDICAL CONDITIONS FOR THE ANAESTHETIST

• Pre-existing medical problems can have a profound influence on the course of anaesthesia and surgery.

• If the patient’s condition requires urgent surgery, use your skills to minimize the harmful effects of pre-existing conditions.
13.8 IMPORTANT MEDICAL CONDITIONS FOR THE ANAESTHETIST

- There is no absolute haemoglobin concentration below which a patient is “unfit for anaesthesia”.

- Look for medical complications in the diabetic patient.

- Low blood sugar is the main intra-operative risk from diabetes. Monitor blood sugar levels and treat, as necessary.