2-4 Hypotension v.1

Hypotension is commonly due to unnecessarily deep anaesthesia, the autonomic effects of neuraxial block, hypovolaemia or combined causes.
You should rapidly exclude a problem in adequate oxygen delivery, airway and breathing first.

START

1 Adequate oxygen delivery

- Pause surgery if possible.
- Increase fresh gas flow AND give 100% oxygen AND check measured F_iO_2.
- Visual inspection of entire breathing system including valves and connections.
- Rapidly confirm reservoir bag moving OR ventilator bellows moving.

2 Airway

- Check position of airway device and listen for noise (including larynx and stomach).
- Check capnogram shape compatible with patent airway.
- Check airway AND airway device are patent (consider passing suction catheter).

3 Breathing

- Check chest symmetry, rate, breath sounds, SpO_2, measured VTexp, $ETCO_2$.
- Feel the airway pressure using reservoir bag and APL valve <3 breaths.
- Exclude high intrathoracic pressure as a cause.

4 Circulation

- Check heart rate, rhythm, perfusion, recheck blood pressure.
- If heart rate <60 bpm consider giving anticholinergic drug (Box B).
- Consider giving vasopressor (Box C) and positioning (e.g. move head down).
- Consider fluid boluses (250 ml adult, 10 $ml.kg^{-1}$ paediatric).
- If heart rate >100 bpm sinus rhythm, treat as hypovolaemia: give i.v fluid bolus.
- If heart rate >100 bpm and non-sinus → **2-7 Tachycardia.**

5 Depth

- Ensure correct depth of anaesthesia AND analgesia (consider risk of awareness).

6 Exclude potential surgical causes (Box D) – discuss with surgical team.

7 Consider causes in Box E and call for help if problem not resolving quickly.

Box A: CRITICAL CHANGES

If problem worsens significantly or a new problem arises, call for **help** and go back to **START** of **1-1 Key basic plan**.

Box B: ANTICHOLINERGIC DRUGS

- Glycopyrrolate 5 $\mu g.kg^{-1}$ (adult 200-400 µg)
- Atropine 5 $\mu g.kg^{-1}$ (adult 300-600 µg)

Box C: VASOPRESSOR DRUGS

- Ephedrine 100 $\mu g.kg^{-1}$ (adult 3-12 mg)
- Phenylephrine 5 $\mu g.kg^{-1}$ (adult 100 µg)
- Metaraminol 5 $\mu g.kg^{-1}$ (adult 500 µg)
- Adrenaline 1 $\mu g.kg^{-1}$ (adult 10-100 µg) in emergency only

Box D: SURGICAL CAUSES

- Decreased venous return (e.g. vena cava compression / pneumoperitoneum)
- Blood loss (unrecognised / undeclared / occult)
- Vagal reaction to surgical stimulation
- Embolism (gas / fat / blood / cement reaction)

Box E: DON'T FORGET!

- Consider whether you could have made a drug error.
- Pneumothorax and/or high intrathoracic pressure can cause hypotension.
- Also consider:
  - Cardiac ischaemia → **3-12**
  - Anaphylaxis → **3-1**
  - Cardiac tamponade → **3-9**
  - Local anaesthetic toxicity → **3-10**
  - Sepsis → **3-14**
  - Cardiac valvular problem
  - Endocrine cause (eg steroid dependency)