

2-6 Bradycardia v.1

Bradycardia in theatre should not be treated as an isolated variable: remember to tailor treatment to the patient and the situation.
Follow the full steps to exclude a serious underlying problem.

START

- 1 **Immediate action:** Stop any stimulus, check pulse, rhythm and blood pressure:
 - If no pulse OR not sinus bradycardia OR severe hypotension: use Box A.
 - If pulse present AND sinus bradycardia: use Box B.
- 2 **Adequate oxygen delivery**
 - Check fresh gas flow for circuit in use 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.
- 3 **Airway**
 - Check position of airway device and listen for noise (including larynx and stomach).
 - Check capnogram shape compatible with patent airway.
 - Confirm airway device is patent (consider passing suction catheter).
- 4 **Breathing**
 - Check chest symmetry, rate, breath sounds, SpO_2 , measured VT_{exp} , $ETCO_2$.
 - Feel the airway pressure using reservoir bag and APL valve <3 breaths.
- 5 **Circulation**
 - Check rate, rhythm, perfusion, recheck blood pressure.
- 6 **Depth**
 - Consider current depth of anaesthesia AND adequacy of analgesia.
- 7 Consider underlying problem (Box C).
- 8 Call for help if problem not resolving quickly.
- 9 Consider transcutaneous pacing (Box D).

Box A: CRITICAL BRADYCARDIA

Give atropine $20 \mu\text{g.kg}^{-1}$ (adult 0.5-1 mg) with fluid flush.

If no pulse: (or heart rate <60 bpm infant or neonate):

- Delegate (minimum) 1 person to chest compressions
- → **2-1 Cardiac arrest**

Box B: DRUGS FOR BRADYCARDIA

- Glycopyrrolate $5 \mu\text{g.kg}^{-1}$ (adult 200-400 μg)
- Ephedrine $100 \mu\text{g.kg}^{-1}$ (adult 3-12 mg)
- Atropine $10 \mu\text{g.kg}^{-1}$ (adult 300-600 μg)
- Isoprenaline $0.5 \mu\text{g.kg.min}^{-1}$ (adult $5 \mu\text{g.min}^{-1}$)
- Adrenaline $1 \mu\text{g.kg}^{-1}$ (adult 10-100 μg) in emergency only

Box C: POTENTIAL UNDERLYING PROBLEMS

- Consider whether you could have made a drug error.
- Consider known drug causes (eg. remifentanyl, digoxin etc).
- Surgical stimulation with inadequate depth.
- Also consider: high intrathoracic pressure; pneumoperitoneum; local anaesthetic toxicity (→ **3-10**); beta-blocker; digoxin; calcium channel blocker; myocardial infarction, hyperkalaemia, hypothermia, raised intra-cranial pressure.

Box D: TRANSCUTANEOUS PACING

- Attach pads and ECG leads from pacing defibrillator.
- Set to PACING MODE.
- Set PACER RATE.
- Increase PACER OUTPUT from 60 mA until capture (spikes align QRS).
- Confirm capture: electrical AND mechanical (femoral pulse).
- Set PACER OUTPUT 10 mA above capture.