MANAGEMENT OF THE POSTOPERATIVE CARDIAC SURGERY PATIENT

General Principles

Unit condition: 2 designated beds for post cardiac surgery patients. Admitted both elective and emergency cases. Usual types of operation: CABG, valvular surgery, aortic dissection repair, TEVAR etc. Occasionally admit patient with percutaneous valvular procedure (eg TAVI). Always check with senior when you receive consult regarding post op cardiac bed.

- Admission note should include
    - Preop condition: comorbidities, cardiac investigations, medications
    - Intraop condition: airway, hemodynamics, TEE result, pacing, hemostasis, weaning of bypass
    - Always refer to operative and anaesthetic record
- Examination – vitals, circulation, drains, pacemaker wires
- Routine bloods – CBP, Clotting, LFT, RFT and electrolytes, ABG (lactate included)
- CXR, ECG
- Medications:
    - Cefuroxime 750mg Q8H (unless allergy)
    - Bactroban topical nasal tds
    - Continue inotropes +/- vasodilators from OT and wean as appropriate. If increasing inotropic support, inform senior. Some practice in our unit:
        - Keep GTN for patients with LIMA graft to reduce vasopasm risk

- The first line inotrope is dopamine, if you think Nor-adrenaline and other inotropes should be used. Check with senior first

- Check with senior before starting beta blocker eg labetalol infusion

- Intravenous fluids: with KCL supplement (eg 10mmol or 20mmol per 500ml) to target serum K >4 mmol/L

- Glucose control: use insulin sliding scale. Target normoglycemia

- Pacemaker at the bedside of all cardiac patients while in ICU. Identify if pacing wires present, if pacemaker from OT attached and operational, continue with appropriate pacing. If no pacemaker from OT or patient is NOT being paced by OT pacemaker, replace OT pacemaker with ICU pacemaker

Respiratory Management

- Following surgery commence all patients on an ICU ventilator

- After the first ABG, adjust the FiO_2 to maintain a PaO_2 >10kPa

- Wean from ventilation according to past medical history, surgery performed and current clinical status

- Extubation criteria: Temperature > 36^0C Awake, analgesed, able to protect airway with a good cough Cardiovascularly stable - MAP >60mmHg, pH 7.35-7.45 Adequate gaseous exchange – PaO_2 >10kPa on FiO_2 0.4 Minimal bleeding – drain output <100ml/hour

- Respiratory failure post-op secondary to collapse/consolidation is common. Ensure good analgesia and frequent, effective physiotherapy.

Management of Bleeding

- *** Call cardiac surgeon and ICU senior early whilst you are continuing with your management

- Perform appropriate investigations: Hcue, CBC, clotting, CXR, Echo
- Correct coagulopathy, optimize fluid status
- Ensure that bedside sternotomy set ready at all times
- Consider re-opening if:

  bleeding >200ml/hr for 3-4 hours

  bleeding >400ml/hr in 1 hour

  total loss >1500-2000mls

- **Hypotension (SBP <100mmHg or MAP <60mmHg)**
- Gradual decline in BP, not uncommon during rewarming
- Correct fluid/blood losses as appropriate using blood or fluid
- Early ECG, Echo and inform cardiothoracic surgeons
- Treat reversible causes – bleeding, pneumothorax, tamponade, kinked graft, graft vasospasm
- Treat arrhythmia
- Inotropes:

  Dopamine/dobutamine – mild hypotension

  Adrenaline/Noradrenaline – severe resistant hypotension with low SVR

- IABP

Sudden and severe hypotension

- Call chief cardiac surgeon and senior ICU staff **immediately**. Inform theatre

- While routine resuscitation underway – exclude tension pneumothorax and cardiac tamponade, consider opening chest in ICU

- **Hypertension**

- The MAP is to be kept quite strictly at about 60-80mmHg for the first 24-36hours

- This may vary according to the patient's preoperative blood pressure and condition (e.g. carotid stenosis). Must discuss with cardiothoracic team if the targets need to be adjusted

- Ensure adequate analgesia: give morphine if patient is in pain

- Titrate GTN infusion or Nitroprusside infusion to maintain MAP of 60-80mmHg

- If hypertension persists – (please discuss with ICU senior and surgeon first) β blocker: atenolol 1-2mg IV or esmolol 10-25mg IV (if no contraindication and good LV). Must be used cautiously after valve surgery.

- **Arrhythmias**

- Treat electrolyte abnormalities, hypoxia, hypercarbia, tamponade, hypotension

- Bradycardia – AV sequential pacing first if < 60 beats per minute

- Atrial fibrillation – if $K^+ < 4$ give potassium, if $K^+ > 4.5$ give amiodarone, cardioversion (inform ICU senior and surgeon first)

- Pulseless VT or VF – defibrillate (observe protocol for defibrillation, inform ICU senior and surgeon)

Anticoagulation

- Patients with saphenous vein grafts should receive aspirin 160mg oral after 24 hours if not bleeding

- For some patients with valve replacements. Check with surgeon first

- Patients with a valve replacement ventilated >48hours may require heparinisation