MANAGEMENT OF SHOCK

Definition of shock

Shock is a state in which there is inadequate blood flow to the tissues to meet demand.

Shock and hypotension often co-exist, BUT a normal blood pressure DOES NOT exclude the diagnosis of shock.

Clinical evidence of organ hypoperfusion include:
Decreased conscious level, skin mottling, cold peripheries, poor capillary refill, oligouria, lactic acidosis.

Different types of Shock:

1. hypovolaemic
2. cardiogenic
3. distributive
4. obstructive

Type of shock	JVP/ CVP	CO	SVR	clinically
Hypovolaemic	↓	↓	↑	cold and shut down
Cardiogenic	↑	↓	↑	cold and shut down
Distributive	↓	↓/-/↑	↓	warm and dilated
Obstructive	↑	↓	↑	cold and shut down

Management of Shock

Early recognition and prompt treatment of the underlying cause of shock
Ensure oxygenation and maintain perfusion
Usually aim for MAP ≥ 65mmHg
u/o ≥ 0.5ml/kg/hr

Hypovolaemic shock

- due to inadequate circulating fluid volume
- **Causes:**

- divided to haemorrhagic or non-haemorrhagic (major burns; gastrointestinal losses: vomiting, fistulas; urinary losses: diabetes, diabetes insipidus; evaporative losses with fever, abdominal surgery)
- **Management:**
- fluid resuscitation
- haemorrhagic cause: transfusion of red cells and blood products. 1:1:1 for red cells, FFP, platelet. Transfusion via blood warmer. Ensure normal iCa level
- review source of bleeding and stop bleeding promptly
- use of hemostatic agent: discuss with senior
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Cardiogenic shock

- due to cardiac pump failure resulting from myocardial or valvular failure

- **Causes:**
- commonest: acute coronary syndrome
- in this ICU with CTS specialty we also encounter post-cardiotomy syndrome
- other causes: arrhythmia, myocardial contusions post-trauma; myocarditis; acute valvular dysfunction; cardiomyopathy
- echo is very useful in reviewing the cause and monitor the progress
- **Management:**
- **ACS: reperfusion by fibrinolytics or PCI**
- control arrhythmia: pharmacological, electrical: pacing/ cardioversion
- optimise preload by fluid: a trial of small bolus of fluid with close observation of CVP/BP trend
- inotropic support: augment myocardial contractility. increasing diastolic blood pressure to increase coronary perfusion pressure and flow
- afterload: vasodilator will cause further hypotension, use with caution in normotensive patients
- mechanical device: IABP, ECMO: discuss with senior

Distributive shock

- due to peripheral vascular dilatation causes a fall in peripheral resistance. The cardiac output is often increased but the perfusion of

vital organs is comprised because the body loses its ability to distribute blood properly. (vasoplegia)

- **Causes:**
- septic shock; anaphylaxis; neurogenic shock
- **Management:**
- Fluid resus
- Septic shock: prompt antibiotics, source control
- Inotropic support: start when BP is refractory to fluid. Usually nor-adrenaline for septic shock
- Anaphylaxis: SC/ IV adrenaline

Obstructive shock

- due to obstruction of great vessels or heart that impedes the blood flow

- **Causes:**
- cardiac tamponade; tension pneumothorax; pulmonary or air embolism
- **Mangement:**
- Promt relief of obstruction: e.g. pericardiocentesis for tamponade, chest drain for tension pneumothorax
- Fluid and inotrope are for temporary support

Common inotropes and vasopressors used in our unit (refer to IPMOE drug set)