

**Definitions and Treatment - Cardiogenic and Septic Shock**

**CARDDIOGENIC SHOCK**
- Systolic blood pressure <90mmHg for 30 minutes despite adequate volume status or Vasopressors required to achieve/maintain ≥90mmHg
- Signs of impaired organ perfusion:
  - a) Altered mental status
  - b) Cold, clammy skin
  - c) Oliguria: <0.5ml/h for 6h
  - d) Increased serum lactate ≥2mmol/L
- Optional haemodynamic criteria:
  - a) Elevated LV-filling pressures
  - b) Reduced cardiac index: ≥1.8 L/min/m² without support
  - c) 2.2 L/min/m² with support

**SEPTIC SHOCK**

**CRITERIA: ORGAN DYSFUNCTION**
- Mental status respiratory rate ≥22/min systolic blood pressure <100mmHg
- **qSOFA**= quick SOFA

**CRITERIA: RISK OF INFECTION**
- Clinics, Laboratories, Temperature, Leukocytes, Heart Rate, "Biomarker", Antibiotics

**AND**
- Suspicion SEPSIS

**DIAGNOSIS SEPTIC SHOCK**
- Volume AND vasopressor for MAP ≥65mmHg
- Serum lactate ≥2mmol/L

**Reference for septic shock**

**ARTIFICIAL VENTILATION**

- **Criteria:**
  - PaO₂/FiO₂, platelets, bilirubin, mean arterial pressure, pH, lactate, serum creatinine, urine output
  - **SOFA** = sequential organ failure assessment

**Cardiac tamponade**
- Tachycardia, dyspnea, muffled heart sounds, distended neck veins, pulsus paradoxus
- Causes: Trauma, iatrogenic, cancer, pericarditis, tuberculosis, aortic dissection

**Acute Myocardial Ischaemia (80% of cardiogenic shock)**
- Myocardial ischaemia associated with characteristic ischaemic electrocardiographic abnormalities and/or serum troponin elevation

**Acute Myocardial Infarction**
- Coronary angiography – Early revascularization
- Echocardiography – Mechanical complications

**Pulmonary Embolism**
- Typical signs with dyspnea, chest pain, (pre) syncope, haemoptysis
- Simplified version of the Wells rule or revised Geneva score D-Dimer testing

**Pulmonary Arterial Hypertension**
- Mean PAPm ≥65mmHg
- Low central venous O₂ saturation (<60%)

**Chronic Cardiomyopathy**
- Decompensation of a previously known cardiomyopathy of any origin

**Post Cardiac Surgery**
- No weaning from cardiopulmonary bypass possible or development of cardiogenic shock after cardiac surgery (including post-heart transplantation)

**Acute Myocardial Infarction**
- Coronary angiography – Early revascularization
- Echocardiography – Mechanical complications

**Cardiac tamponade**
- Pericardiocentesis
- Echocardiography – Surgery (aortic dissection)

**Acute or chronic cardiomyopathy/Post cardiac surgery**
- Fluid challenge if no overt volume overload, inotropes (Dobutamine, Levosimendan) and/or vasopressors (Norepinephrine);
  - consider temporary mechanical circulatory assist devices in hemodynamic shock

**Vascular access**
- Central venous access
- Blood cultures
- Source control
- Antibiotics

**Volume management**
- Volume should be infused as long as haemodynamic parameters improve.
- 30ml/kg in the first 3h
- CVP 8-12mmHg
- **Diagnosis SEPSIS**
- Blood cultures
- 2 samples of aerobic/anaerobe cultures before antibiotic therapy
- **Source control**
- Target tidal volume of 6ml/kg predicted body weight
- Upper limit goal of plateau pressures of 30cm H₂O

**Antibiotics**
- Administration of intravenous antimicrobials as soon as possible after recognition and within 1 h for both sepsis and septic shock

**Abbreviations:**
- mL= milliliter
- L= liter
- h= hour
- mmHg= millimeters mercury
- PaO₂= arterial oxygen pressure
- PAPm= mean pulmonary arterial pressure
- MAP= mean arterial pressure
- qSOFA= quick SOFA
- r= revised
- CVP= central venous pressure
- PWP= pulmonary wedge pressure
- SOFA= sequential organ failure assessment
- LV= left ventricle
- PCWP= pulmonary capillary wedge pressure
- D-Dimer= measurement of D-Dimer