Shock & Primary Assessment of Critically ill Patients
Objectives: SSBAT

• Define the types of shock and the pathophysiological changes.

• Describe the components of primary assessment.

• Demonstrate knowledge of appropriate interventions to stabilise a critically ill patient and evaluate their effectiveness.
Classification & Aetiology of Shock

- Shock is a clinical syndrome resulting from inadequate tissue perfusion needed to meet the oxygen and nutritional needs of cells (Dolan & Holt, 2000).

- The body responds initially by activating intrinsic compensatory mechanisms to improve perfusion to the brain, heart and lungs.

- When these mechanisms fail a cascade of cellular abnormalities result in total organ dysfunction and eventually death. (Lim et al 2007)
<table>
<thead>
<tr>
<th>Classification</th>
<th>Signs &amp; symptoms</th>
<th>Causes</th>
<th>Management</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hypovolemic Shock</strong></td>
<td>•Cool, pale, clammy · ↓ BP, ↓ HR · Cyanosis · Restlessness · ↓ UO &amp; Cap refill</td>
<td>•Blood loss · Burns · Adrenal crisis · Vomiting &amp; Diarrhoea</td>
<td>•IV fluid replacement · Volume expanders · Blood &amp; blood products · Monitor BP &amp; CVP</td>
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<tr>
<td>Decreased Blood Volume</td>
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<td><strong>Septic Shock</strong></td>
<td>•Fever · Chills · Greyish skin(gram neg shock) · Reddish skin (gram pos shock) · Restlessness · Confusion</td>
<td>•Vasodilation &amp; pooling of blood caused by release of bacterial toxins (caused often by gram neg septicaemia)</td>
<td>•O2 therapy · IV Fluids · Antibiotics · Corticosteroids – to ↓ inflammation &amp; increase microcirculation · Assess for S&amp;S of infection · Remove source of infection</td>
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<td>Risk factors:</td>
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<tr>
<td>UT procedures</td>
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<td>immunosupression,</td>
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<td>peritonitis from blood in peritoneal cavity</td>
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<td>Food poisoning</td>
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<tr>
<td>Classification</td>
<td>S&amp;S</td>
<td>Causes</td>
<td>Management</td>
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<td><strong>Cardiogenic Shock</strong></td>
<td>•S&amp;S of MI</td>
<td>•MI</td>
<td>•Dopamine or Dobutamine to ↑ CO &amp; ↑ Myocardial contractility</td>
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<td>Failure of heart to</td>
<td>•↓ BP, ↓ HR</td>
<td>•CCF</td>
<td>•Nor ephinephrine to ↑BP, ↑ CO ↑ HR</td>
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<td>pump effectively</td>
<td>•Jugular vein distension</td>
<td>•Cardiac arrhythmias</td>
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<td></td>
<td>•N&amp;V</td>
<td>•Pericardial tamponade</td>
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<td></td>
<td>•Dyspnoea</td>
<td>•Tension pneumothorax</td>
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<td></td>
<td>•Oliguria</td>
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<td><strong>Neurogenic Shock</strong></td>
<td>•Sudden hypotension</td>
<td>•Exposure to unpleasant circumstances</td>
<td>•Vasopressors</td>
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<tr>
<td>Interruption of SNS</td>
<td>•Hypothermia</td>
<td>•Extreme pain</td>
<td>•Steroids</td>
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<td>Leads to vasodilation &amp; blood pooling</td>
<td>•↓ HR due to vagal stimulation</td>
<td>•Spinal cord injury</td>
<td>•Monitor BP &amp; assess for cardiac arrhythmias</td>
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<td></td>
<td></td>
<td>•Head Injury</td>
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<td></td>
<td></td>
<td>•High spinal anaesthesia</td>
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<td>•Vasomotor depression</td>
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<td><strong>Anaphylactic shock</strong></td>
<td>•Dyspnoea,</td>
<td>•Allergic reaction to insect venom, medications, blood</td>
<td>•Epinephrine</td>
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<td></td>
<td>•Wheezing</td>
<td>transfusion or dyes to radiological studies</td>
<td>•Antihistamines</td>
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<tr>
<td></td>
<td>•Oedema around site of injection or</td>
<td></td>
<td>•Aminophylline for bronchospasm</td>
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<tr>
<td></td>
<td>sting</td>
<td></td>
<td>•Apply pressure to site of injection or sting</td>
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<td></td>
<td>•Urticaria</td>
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<td>to ↓ absorption</td>
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<td></td>
<td>•Flushed skin</td>
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<td></td>
<td>•Tight sensation in throat/ voice</td>
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<td>change indicating laryngeal oedema</td>
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Patients at risk of Life-Threatening Events

- Admitted as emergencies
- Elderly patients
- Pre-existing disease – chronic
- Acute illness
- Shocked patient
- Post anaesthesia/ post surgery
- Patients transferred from ICU/HDU/CCU
- Patients requiring blood transfusion.
Primary Assessment

Aims: Assist student to

- Predict - Recognise the ‘at risk’ patient
- Prevent - Identify problems early
- Treat - Initiate simple treatment
- Communicate - Improve communication skills to team members
Assessing the critically ill patient

• Use Primary Assessment: A-B-C-D-E to assess, monitor and treat the patient.

• Call for help

• Decision & planning

• Reassess

• Management plan
A-B-C-D-E

- **A** - Airway
- **B** - Breathing
- **C** - Circulation
- **D** - Disability
- **E** - Exposure

**Remember**

Airway adjuncts, oxygen, bag-valve-mask ventilation, fluids, recovery position, blood glucose, monitoring:- pulse oximeter, ECG & BP monitor.
AIRWAY

- Assessment
- Patent?
- Compromised?
A - Airway

Obstruction is a medical emergency.

Causes –

**Upper airway obstruction**
- vomit, secretions – blood/gastric fluid
- Swelling – trauma, allergy, infection

**Lower airway obstruction**
- laryngeal oedema – burns, allergy
- Laryngeal spasm – foreign body, secretions
- Tracheobronchial obstruction – secretions, inhaled gastric contents, pulmonary oedema
Airway - Assessment

Look
• Chest rise & fall.
• See-saw, use of accessory muscles, tracheal tug
• Central cyanosis is a late sign of obstruction

Listen
• Complete obstruction - no sounds,
• Partial - diminished/noisy
• Gurgling – fluid
• Obstruction by tongue
• Inspiratory stridor – obst above level of larynx
• Expiratory wheeze – airway collapse during expiration
Airway - Management

- Use head tilt/chin lift manoeuvre
- Airway adjuncts: oropharyngeal airway, Naso tracheal intubation
- Suction to remove the secretions
- If not successful - Tracheal intubation/cricothyroidectomy
Breathing - Assessment

**Look** (observe deformity, raised JVP, drains)
- Sweating
- Cyanosis
- Use of accessory muscles/abdominal breathing
- Rate & dept of breaths
- Equality of chest movements

**Listen**
- Near face-note presence of secretions, stridor/wheeze
- Auscultate - note dept & equality, consolidation, sounds

**Feel**
- Position of trachea
- Palpate for crepitus/emphysema, assess depth & equality
- Percussion note – hyper-resonance: pneumothorax, dullness: fluid
Breathing - Management

Present
• Effective: O2 100% via nonrebreather mask (12-15 litres)
• Ineffective: O2 100%, assist ventilations, intubate

Absent
• Ventilate with bag-valve-mask device with oxygen
• Assist with endotracheal intubation
IMMEDIATE LIFE THREATENING CONDITIONS

Open chest wound
IMMEDIATE LIFE THREATENING CONDITIONS

Large Haemothorax
Interventions

• Needle thoracostomy
• Pericardiocentesis
Chest drain insertion
C - Circulation

In almost all surgical & medical emergencies, hypovolaemia should be considered to be the primary source of shock

(S&S:- tachycardia, altered LOC, uncontrolled external bleeding, distended/flattened jugular veins, pale, cool, diaphoretic skin, distant heart sounds)
Circulation - Assessment

Look
• Signs of compromise, cool pale digits, decreased capillary refill, peripheral cyanosis, decreased LOC
• Signs of external haemorrhage

Listen
• Obtain BP – may be normal. Decreased pulse pressure indicates arterial vasoconstriction (may get other team member to obtain BP)

Feel
• Palpate peripheral & central pulses- rate, rhythm quality & equality

Aim - replace fluid, control haemorrhage, restore tissue perfusion
Circulation - Management

• Adequate Venous Access – insert two 14-16g cannula
• Rapid fluid challenge - 500mls over 5-10 mins
• Repeat 500mls over 5-10mins if hypotensive i.e. systolic BP below 100mmHg
• Reassess pulse rate and BP every 5 mins
• Take bloods – FBC, U&E, clotting, Obtain blood for typing- determine ABO & Rh group
D - Disability

• Examine the pupils – for size, shape & reaction to light

• AVPU scale

  A  Alert
  V  Voice
  P  Pain
  U  Unresponsive

• Hypoglycaemia must be excluded - if below 3mmom/l give 25-50ml of glucose solution IV

• Place in recovery position if decreased LOC
E - Exposure

- Full body exposure is required for examination
- Insure dignity is respected & heat loss prevented
- Perform focused examination of frontal and dorsal aspects of the body.

- Do you need HELP?
Full Patient Assessment

• Review patients notes & charts (TPR, BP, neurological, fluid balance, drug prescription)
• Obtain Patients history
• Review routine investigation & results (Biochemistry, Haematology, Microbiology, Radiology, ECG)
• Decisions & Planning – is patient improving or not: Reassess ABC’s
• Record Keeping
• Definitive Care
Patient History

• A  Allergies  (eg Penecillin Aspirin)
• M  Medications  (beta-blockers Warfarin)
• P  Past medical history  (previous surgery or anaesthetic reaction)
• L  Last ate/drank
• E  Events leading to presentation.  
  (i.e. Fall >5m in height, seizure, post-op, received meds)
Communication & Organisational Skills

• Managing critically ill patients using the ABCDE demand good organisational and communication skills.
• Ensure communication is carried out once the patient is assessed, examined and initial treatment is given.
• Ensure the message is clear and succeeds in attaining your intended goal – getting help to you quickly.

‘He is very unwell, I want to you come and review him, I am very worried that he is deteriorating’
Diagnostic procedures

Lab studies
• Blood typing, FBS, U&E, Clotting factor,
• Urinalysis
• Arterial pH, PaO2, PaCO2 and base deficit

Radiological Studies
• CXR – presence of haemothorax or pneumothorax and assess size of mediastinum
• Pelvis radiograph to locate fractures
• Femur radiograph
References

• ALERT – Acute Life-threatening Events Recognition and Treatment 2003, 2nd ed, University of Portsmouth & NHS Trust

• ATLS – Advanced Trauma Life Support, American College of Surgeons, 7th ed. USA.


• Classification Available http://two.xthost.info/wardclass/ClassificationofShock.pdf (11/01/2009)