

3-14 Sepsis v.1

Severe sepsis (hypotension persisting after initial fluid challenge of 30ml.kg^{-1} or blood lactate concentration $\geq 4\text{mmol.l}^{-1}$ if infection most likely underlying cause) or septic shock (sepsis with end organ dysfunction).

START

- 1 Call for help and inform theatre team of problem.
- 2 Increase FiO_2 , consider reducing anaesthetic agent and intubate patient.
- 3 Give crystalloid i.v.:
 - Adult: at least 30 ml.kg^{-1} (Box A, Box B).
 - Child: at least 20 ml.kg^{-1} (Box C).
- 4 Take bloods including blood gas, lactate, FBC, U&Es, coagulation and cultures.
- 5 Give empiric intravenous antimicrobials within 1 h (seek microbiology advice).
- 6 Consider whether indwelling devices could have caused a septic shower.
- 7 If patient is not improving proceed to the next steps.
- 8 Insert central and arterial access lines. Check serial lactates.
- 9 Start noradrenaline to achieve mean arterial pressure $\geq 65\text{ mmHg}$ (Box D).
- 10 Insert urinary catheter and record hourly urine output.
- 11 Consider monitoring cardiac output to further aid fluid and vasopressor therapy.
- 12 Identify source of sepsis, consider source control and send source cultures if possible (eg. surgical site, urine, broncho-alveolar lavage).
- 13 Discuss whether appropriate to abandon or limit surgery.
- 14 Discuss ongoing management plan with intensive care team.

Box A: FLUID THERAPY

- Crystalloids initial fluid of choice in severe sepsis and septic shock.
- Greater than 30 ml.kg^{-1} of crystalloid may be required in some patients.
- Continue fluid challenge if haemodynamic improvement.
- Hydroxyethyl starches should not be used.

Box B: SET PHYSIOLOGICAL GOALS

- Central venous pressure.
- Mean arterial pressure.
- Urine output.
- Central venous (superior vena cava) or mixed venous saturation.

Box C: PAEDIATRIC CONSIDERATIONS

- Goals: capillary refill time (CRT) ≤ 2 secs, normal BP for age, normal peripheral pulses, warm extremities, urine $>1\text{ ml.kg}^{-1}.\text{hr}^{-1}$, $\text{SCVO}_2 >70\%$.
- Give 20 ml.kg^{-1} initially up to or over 60 ml.kg^{-1} fluid until goals or unless rales or hepatomegaly develops.
- Begin peripheral inotropic support pending central/intraosseous access.
- If warm shock ($\uparrow\text{HR}$, $\downarrow\text{BP}$) start noradrenaline.
- If cold shock ($\uparrow\text{HR}$, $\downarrow\text{CRT}$) start dopamine and, if resistant, adrenaline.

Box D: DRUG THERAPY

- **Noradrenaline (NA)** as first choice vasopressor.
- **Adrenaline** added to noradrenaline when additional agent needed.
- **Vasopressin** $0.03\text{ units.min}^{-1}$ added to $\uparrow\text{MAP}$ or $\downarrow\text{noradrenaline}$ need.
- **Dobutamine** up to $20\text{ }\mu\text{g.kg}^{-1}.\text{min}^{-1}$ if evidence of myocardial dysfunction or ongoing signs of hypoperfusion despite adequate MAP and adequate intravascular volume.
- **Hydrocortisone** if unable to restore haemodynamic stability.