

Systemic Inflammatory Response Syndrome (SIRS) criteria =

| | |
|------|-------------------------------------|
| Temp | > 38 or < 36 |
| RR | > 20 or PaCO ₂ < 4.3 kPa |
| HR | > 90 |
| WBC | < 4 or > 12 (x10 ⁹ / L) |

Causes include sepsis, burns, trauma, pancreatitis

Definitions

Sepsis = SIRS plus suspected infection
Severe sepsis = sepsis plus organ failure or evidence of tissue hypoperfusion
Septic shock = severe sepsis plus hypotension refractory to fluid (SBP < 90 mmHg or fall by > 40 mmHg from norm, or lactate > 4)
CAUTION: Be alert for neutropenia / immunodeficiency
 Interpret observations with care if elderly / HT / cardiac drugs

Suspected Infection

Clinical: history / examination suggestive of infection eg pneumonia, UTI, meningitis, abdominal infection, septic arthritis, cellulitis, osteomyelitis, endocarditis, line infection etc

Investigations: WCC > 12 or < 4, CRP > 10
 CXR changes, positive urinalysis
 positive LP, positive blood culture

Indicators of Severe Sepsis / Septic Shock

CVS: SBP < 90 or drop of > 40 from baseline or MAP < 65
 Hypotension refractory to initial fluid resuscitation
Resp: New or increased O₂ requirement to maintain sats > 90%
 PaO₂/FiO₂ ratio < 40 or PaO₂ < 16 on 40% O₂; RR > 30
Renal: Creatinine > 176 or 1.5 x baseline
 UOP < 0.5 mL/kg/hr for > 2 hrs
CNS: Acutely altered mental status
Bloods: Lactate > 4 mmol/L, Bilirubin > 34 micromol/L
 Platelets < 100, INR > 1.5 or APTT > 60 secs

Sepsis?

2 or more SIRS plus suspected infection

No

Exit Pathway

Yes

Investigations

SEPSIS: iv cannula, VBG, FBC, U&E, & BG, blood culture, MSU
SEVERE SEPSIS: add 2nd blood culture, LFT, clotting, ABG, consider echo
 Consider swabs, CXR, amylase, CT, LP as indicated by clinical condition

Sepsis Six – within 1 hour:

1. High flow oxygen if sats < 94%
 2. Cultures
 3. IV antibiotics
 4. IV fluids
 5. Serial lactate & Hb
 6. Hourly UOP
- [Surviving Sepsis Campaign](#)

Sepsis

- iv antibiotics (see [anti-microbial policy](#))
- iv fluid if lactate > 2, HR > 130, RR > 25 or any mild organ dysfunction iv crystalloid 250 – 500 mL bolus & reassess
- High flow oxygen if sats < 94%
- catheterise after antibiotics (unless able to accurately monitor UOP without)
- Reassess patient and consider repeat lactate if initial elevated or patient worsens

Severe Sepsis / Septic Shock

- iv antibiotics (see [anti-microbial policy](#))
 - iv fluid crystalloid 20 – 30 mL/kg (to nearest L)
 - High flow oxygen if sats < 94% (target 94-98%)
 - catheterise after antibiotics (unless able to accurately monitor UOP without)
 - Hourly lactate until improvement
- Reassess patient including hourly lactate / parameters plus echo / cardiac output measures
IVC collapse index > 33-50% (high degree of collapse with respiration) = fluid responsive
stroke volume increase with fluid by > 10-15% = fluid responsive
- If not achieving SBP / MAP despite fluids, insert central venous and arterial lines and start vasopressors
 If evidence poor LV function on echo plus hypoperfusion despite vasopressors, add inotropes
- Vasopressors:** First line: Noradrenaline 4 mg in 50 mL 5% Glucose; start at 5 mL/hour (range 5 - 20 mL/hour) or 0.02 – 1 mcg/kg/min
 Second line: Adrenaline dose as above
 use in addition to or instead of noradrenaline
- Inotropes:** First line: Dobutamine 250 mg in 50 mL 5% Glucose start at 5 mL/hour (range 5 - 20 mL/hour) or 0-10 mcg/kg/min
- Consider:**
- Higher MAP target (eg known hypertensive) or 2nd vasopressor – discuss with ITU
 - Transfusion if Hb < 7 g/dL (Hb < 10 g/dL if IHD) (evidence for improving oxygen delivery is weak)
 - Platelets if < 5 OR 5 - 30 with significant risk of bleeding OR < 50 and planned invasive procedure
 - FFP if bleeding or invasive procedure
 - Correct electrolyte abnormalities (K, Ca, PO₄, Mg)
 - If on long term steroids give iv hydrocortisone 200 mg. Consider if resistant shock (poor evidence)
 - Other causes persistent high lactate eg ischaemic bowel
 - VTE prophylaxis

**Move to resus
Call ITU bleep 087**

Goals of Treatment Achieved?

- SBP > 90, MAP > 65,
- lactate < 2.5 or reduced by 20%,
- urine output > 0.5 mL/kg/hr
- Sats 94-98%
- improved organ dysfunction

Yes

Admit
Acute specialty bed or CDU

No

Admit
ITU / HDU or Monitored bed

**Indications for Ventilation:
(NIV unless contraindicated)**

**Resistant shock despite fluids, transfusion, vasopressors and inotropes
pulmonary oedema
respiratory failure
falling GCS**

Guide to ARDS ventilation – Call ITU bleep 087

Preparation:

Prepare fluid bolus 20 mL/kg
 Prepare ephedrine 3 - 9 mg bolus
 Don't forget NGT
 Raise bed head to 45° (post intubation)
Sedation:
 Propofol & Fentanyl
 OR
 Midazolam & Fentanyl

Ventilation:

TV 6 mL/kg **IBW**
 Rate < 35 / min
 FiO₂ < 60%
 Aim sats 94 - 98% (unless chronic lung disease)
 PEEP 5 mmHg
 Initial I:E ratio 1:2
 Permissive hypercapnia pH > 7.2

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Reference Documents

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