Early recognition of meningitis and sepsis*

Vital signs for front line nurses

Meningitis and sepsis can kill in hours. Sepsis and meningitis can occur on their own but often appear together. Meningococcal sepsis without signs of meningitis is far more life-threatening. Early recognition depends on knowing what to look for:

**OBSERVATIONS**

- Temperature
- Heart rate
- Respiratory rate
- Oxygen saturation
- Capillary refill time
- Check for rash all over
- Blood pressure - check this if other signs outside normal

**Non-blanching rash**

- Typical of meningococcal sepsis
- Pin-prick spots, purple blotches, bruises or blood blisters
- May be absent (especially in pure meningitis), scanty, or rapidly evolving (in sepsis).

**Up to 30% of meningococcal sepsis cases start with a blanching rash.**

MRF now use the word ‘sepsis’ in place of ‘septicaemia’ in line with national recommendations.
FINDINGS

### Sepsis

*Sepsis* causes shock which can lead to multi-organ failure.

**Look for**
- Limb or joint pain - may be severe. Isolated limb pain is a well established symptom of sepsis
- Pallor, mottled skin
- Cold hands and feet
- Tachycardia
- Tachypnoea
- Rigors
- Conscious level: early in shock - children often alert and able to speak as shock advances
  - babies - limp and floppy
  - older children and adults - unable to stand
- Metabolic acidosis - blood gas (arterial, capillary or venous) can confirm shock. Base deficit worse than -5 mmol/l is significant.
- Reduced urine output

**Late signs**
- Impaired consciousness - likely to be late in children
- Hypotension
- Cyanosis

### Meningitis

*Meningitis* causes raised intracranial pressure, which can lead to coning (brain stem herniation) and brain death.

**Look for**
- Neck stiffness, headache, photophobia in older children and adults
- Neck stiffness, photophobia uncommon in young children - their absence should not be reassuring
- All children - poorly responsive, staring, difficult to wake. Parents may report poor eye contact.
- Babies - irritable with a high pitched cry, particularly when handled
- Babies - stiff body, jerky movements, abnormal tone
- Teenagers and adults may be combative, confused or aggressive - you may suspect drug/alcohol use
- Seizures

**Late signs**
- Raised Intracranial Pressure:
  - Raised BP, slow pulse rate
  - Glasgow Coma Score <9 or rapidly falling
  - Dilated, unequal, or poorly reacting pupils
  - In babies, tense/bulging fontanelle

### Meningococcal disease


**Red Flag Symptoms** of sepsis and circulatory shut-down: limb pain, pale or mottled skin, and cold extremities can appear 5 or more hours earlier than classic symptoms.

**Late signs**
- Raised Intracranial Pressure:
  - Raised BP, slow pulse rate
  - Glasgow Coma Score <9 or rapidly falling
  - Dilated, unequal, or poorly reacting pupils
- In babies, tense/bulging fontanelle

### ACTION

#### 1

**Very sick patient (with or without rash): shock/depressed conscious level/seizures?**
Place in Resus, record all observations and put on continuous monitor. Ensure bloods are sent for investigations including blood gas. Call the most senior doctor available immediately. IV antibiotics and first fluid bolus within one hour.

#### 2

**Non-blanching rash with fever (or history of fever)?**
Immediate review by Senior Doctor, record all observations and put on continuous monitor. Ensure bloods sent for investigations including blood gas. IV antibiotics within one hour. Give fluid bolus if lactate >2mmol/litre.

**Suspected meningitis with or without rash?**
Ensure prompt medical review, bloods sent for investigation including blood gas. IV antibiotics given immediately. At least hourly observations. If rash becomes non-blanching, treat as in 2 above.

#### 3

**Possible early sepsis, no rash or blanching rash?**
Ensure prompt medical review, check for developing signs of sepsis and/or meningitis with at least hourly observations. If any of the observations are abnormal, ensure bloods sent for investigations including blood gas.

#### 4

If observations change, consider if patient getting sicker and needs more urgent treatment as in 1 or 2.

Refer to Management algorithms for paediatric, neonatal and adult settings (details overleaf)

It is rarely possible to exclude meningitis or sepsis in a patient with non-specific symptoms. If you are sending a patient home it is important to provide a safety net. Give them information (see back page for contact details to order free patient information) and encourage them to seek medical help if it gets worse, even if it is shortly after you’ve seen them.