Endorsed by the Irish Nurses Organisation

Meningitis Research Foundation

Early Recognition of Meningitis and Septicaemia

Vital signs for front line nurses

Meningococcal disease is the leading infectious cause of death in children. The two main clinical presentations, septicaemia and meningitis, can occur on their own but often appear together. **Septicaemia 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
- Conscious level (AVPU)
- Check for rash all over
- Blood pressure - check this if other signs outside normal

NORMAL VALUES OF VITAL SIGNS

Age *(years)*	Heart Rate *per minute*	Respiratory Rate *per minute*	Systolic Blood Pressure
<1	110-160	30-40	70-90
1-2	100-150	25-35	80-95
2-5	95-140	25-30	80-100
5-12	80-120	20-25	90-110
over 12	60-100	15-20	100-120

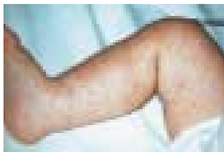
Oxygen Saturation: normal value is >95% in air. If SaO_2 monitor is not picking up, check perfusion - capillary refill should be <2 seconds

From Advanced Paediatric Life Support Manual

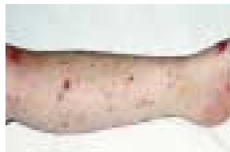
Non-blanching rash

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

Up to 30% of cases start with a blanching macular rash.



maculopapular rash with scanty petechiae†



early purpuric rash of septicaemia†

†Courtesy: Dr A Riordan

Findings

SEPTICAEMIA

Septicaemia causes shock which can lead to multi-organ failure.

LOOK FOR

- Pallor
- Tachycardia
- Tachypnoea
- Cold hands and feet, mottling
- Conscious level:

  early in shock - children often alert and able to speak

Child lucid despite advancing septicaemia

  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.

LATE SIGNS

- Impaired consciousness - in children
- Hypotension
- Cyanosis

MENINGITIS

Meningitis causes raised intracranial pressure, which can lead to coning 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 posturing
- Teenagers and adults may be combative, confused or aggressive - you may suspect drug abuse
- Seizures

LATE SIGNS

- Raised Intracranial Pressure:
  - ↑BP ↓Pulse rate
  - Glasgow Coma Score <8 or rapidly falling
  - Dilated, unequal, or poorly reacting pupils

MENINGOCOCCAL DISEASE

Meningococcal Disease - non-specific symptoms of illness may be present. Particularly ***ask about***

- Pain - in joints and muscles, or in a specific limb. Pain may be very severe
- GI disturbance - vomiting or diarrhoea, abdominal pain is common
- Rigors - in septicaemic patients
- Fever - or history of fever if afebrile on presentation

Action

1 Very sick patient (with or without rash): shock/depressed conscious level/seizures?

- Resus, record all vital signs and put on continuous monitor, call Senior Doctor immediately, ensure i.v. antibiotics are given, ask for blood gas.

2 Non-blanching rash with fever (or history of fever)?

- Record all vital signs and put on continuous monitor, call Senior Doctor immediately, ensure i.v. antibiotics are given, ask for blood gas.

3 Suspected meningitis with or without rash?

- Half hourly vital signs, ensure prompt medical review, ensure i.v. antibiotics are given. If rash is non-blanching, treat as in 2 above.

4 Possible early septicaemia, no rash or blanching rash?

- Half hourly vital signs, check for (developing) rash, ensure prompt medical review, ask for blood gas.

3&4 If vital signs change, consider if patient getting sicker and needs more urgent treatment as in 1 or 2.

Public Health

- Doctor reports suspected meningococcal disease to Public Health Specialist who arranges prophylaxis for close personal contacts.
- Where local protocol agreed with public health, ward staff may give prophylaxis.
- Isolate patient for first 24 hours.
- Public health guidelines: prophylaxis only for health workers whose mouth or nose is directly exposed to large particle droplets/secretions from the respiratory tract of a patient with meningococcal disease. This may occur when undertaking airway management or if patient coughs in your face.

About Meningitis Research Foundation

Meningitis Research Foundation is a national registered charity whose vision is a world free from meningitis and septicaemia. The Foundation operates a **LoCall 24 hour helpline 1890 41 33 44.** At all hours of the day or night trained staff and qualified nurses speak to callers, give information to people dealing with a case, and offer support and befriending to patients and families affected.

On the basis of research and consultation, the Foundation produces guidance notes and protocols to promote best practice in the diagnosis and treatment of meningitis and septicaemia.

These can be obtained **free of charge** from our website or any of our offices, along with a range of resources for patients: **www.meningitis.org**

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This resource was written by Dr Nelly Ninis and Linda Bailey RGN/RSCN with input from a panel of experts. A pilot version was evaluated by a sample of hospital nurses throughout the Ireland and the UK.

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