INTRODUCTION[1]

Meningococcal disease is the leading infectious cause of death in children and young adults and can kill a healthy person of any age within hours of their first symptoms. There are two main clinical presentations that often co-occur:

1. meningitis
2. septicaemia

Meningococcal septicaemia occurs when meningococcal bacteria invade the bloodstream and release their toxic products. This can progress rapidly to shock and circulatory collapse. Deterioration is often rapid and irreversible, with treatment becoming less effective by the minute.

Clinical outcome is largely dependent upon early recognition and early intervention.

ASSESSMENT

Airway:

Breathing:

- breathing rate
- breathing effort
- measure oxygen saturation (SpO_2)

Circulation:

- pulse
- capillary refill time

Disability:

A	Alert
V	Responds to voice
P	Responds to painful stimulus
U	Unresponsive

Expose:

- look for rash (***see below***)
- take temperature if appropriate.

The patient may have been previously unwell with non-specific symptoms, for example:

- irritability
- pyrexia
- 'flu-like' symptoms.

THE RASH

Presentation – classically haemorrhagic type (purpuric). In pigmented skin it may be helpful look at conjunctivae under lower eyelid.

If a glass tumbler is pressed firmly against a purpuric rash the rash will **NOT** fade, **rash remains visible through the glass.**

If there is a non blanching rash in an unwell person, meningococcal septicaemia must be assumed.

A non-blanching rash is indicative of meningococcal septicaemia but is not a foolproof technique, there may be **NO** rash.

Any patient in whom meningococcal disease is suspected should be re-assessed regularly for the appearance of a non blanching rash.

CLINICAL FINDINGS

The patient will present as "unwell" and the clinical condition may rapidly deteriorate to include:

- raised respiratory rate & effort
- raised heart rate (relative bradycardia is a very late sign)
- capillary refill >2 seconds, skin cold to touch (especially in extremities)
- skin may appear mottled (early in illness, skin may be warm)
- SpO_2 reduced or may be unrecordable (poor perfusion)
- raised temperature (peripheral shutdown or any antipyretics given may mask this)
- rigors
- vomiting, abdominal pain, and diarrhoea
- rash – develops into a petechial, bruise like purpuric rash or blood blisters
- may be no rash
- pain in joints, muscles and limbs
- seizures.

Level of consciousness:

- early in shock alert / able to speak
- as shock advances:-
  - **babies:** limp, floppy and drowsy
  - **older children and adults:** difficulty in walking, standing, drowsy, and confused.

MANAGEMENT[2-6]

Open airway.

Administer high concentration oxygen (O_2) via a non-re-breathing mask, using the stoma in laryngectomee and other neck breathing patients, to ensure an oxygen saturation (SpO_2) of >95%, except in patients with chronic obstructive pulmonary disease (COPD) (***refer to COPD guideline***)

Consider assisted ventilation at a rate of 12–20 breaths per minute if:

- SpO_2 is <90% on high concentration O_2
- respiratory rate is <10 or >30
- expansion is inadequate

Correct A and B problems at scene then **DO NOT DELAY TRANSFER** to nearest receiving hospital.

Administer benzylpenicillin[7,8] (***refer to benzylpenicillin protocol for dosages and information***) **IN TRANSIT**.

NOTE: The illness may progress rapidly – the sooner benzylpenicillin is administered the better the outcome.

Fluid therapy

Patients with septicaemia develop a relative hypovolaemia as they are vasodilated (increasing the vascular volume) and also lose fluid into many tissues (oedema). Increasing the circulating volume can help counteract this effect.

Central pulse **ABSENT**, radial pulse **ABSENT** – is an absolute indication for urgent fluid.

Central pulse **PRESENT**, radial pulse **ABSENT** – is an indication for urgent fluid depending on other indications including tissue perfusion and blood loss.

Central pulse **PRESENT**, radial pulse **PRESENT – DO NOT** commence fluid replacement[10] **UNLESS** there are other signs of circulatory failure (cold peripheries, delayed capillary refill time, mottled skin, weak thready pulse) then commence:

- **ADULTS** – 250ml bolus of crystalloid
- **CHILDREN** – 20ml/kg bolus of crystalloid.

Re-assess vital signs prior to further fluid administration.

DO NOT delay at scene for fluid replacement; wherever possible cannulate and give fluid **EN-ROUTE TO HOSPITAL**.

Check blood glucose level and treat if necessary.

Provide hospital alert message including age of patient.

Repeat assessment and further management of ABCs as necessary en route.

RISK OF INFECTION TO AMBULANCE PERSONNEL

Meningococcal bacteria are very fragile and do not survive outside the nose and throat.

Public health guidelines recommend preventative antibiotics 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 type of exposure is unlikely to occur unless Ambulance Clinicians are in close proximity to patients, for example, when undertaking airway management or inhaling droplets when patients cough or sneeze.

When a case of meningococcal disease is confirmed, the public health Doctor will ensure that antibiotics are offered to any contacts of the case whose exposure puts them at increased risk of infection.

Key Points – Meningococcal septicaemia

- Meningococcal disease is the leading infectious cause of death in children and young adults and can kill a healthy person of any age within hours of their first symptoms.
- There are two main clinical presentations, meningitis and septicaemia, that often co-occur.
- The patient may have non-specific symptoms, such as irritability, pyrexia, and 'flu-like' symptoms.
- Look for rash; a non-blanching rash is indicative of meningococcal septicaemia but is not conclusive.
- Re-assess patients regularly for the appearance of a non blanching rash.
- Administer benzylpenicillin; the illness may progress rapidly, the sooner benzylpenicillin is administered the better the outcome.

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METHODOLOGY

Refer to methodology section.