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Meningitis Research Foundation

Meningococcal Septicaemia

Identification & Management for Ambulance Personnel

Meningococcal disease is the leading infectious cause of death in children and can kill a healthy person of any age within hours of their first symptoms. There are two main clinical presentations: meningitis and septicaemia. These can occur on their own, but often occur together. **Septicaemia in the absence of signs of meningitis can be even more life-threatening than meningitis alone.**

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

The speed with which the disease is identified and treatment started mainly determines the outcome.

Signs and symptoms indicative of meningococcal septicaemia *(see below)

- **With non-blanching rash** → **Give benzylpenicillin and treat shock**
- **No rash or other rash** → **Treat shock, keep looking for rash**

...during rapid transportation to hospital

Assessment

- **Airway**
- **Breathing** - rate & effort. Measure oxygen saturation
- **Circulation** - pulse & capillary refill time
- **Disability** - AVPU
- **Expose** - look for rash - take temperature if appropriate

NB. The patient may have been previously unwell with non-specific symptoms.
E.g. raised temperature, cold symptoms.

Normal values of vital signs*

Age (years)	Respiratory rate /min	Heart rate /min
<1	30-40	110-160
1-2	25-35	100-150
2-5	25-30	95-140
5-12	20-25	80-120
12+	15-20	60-100

**Advanced Paediatric Life Support - the Practical Approach. Mackway Jones K, Molyneaux E, Phillips B, Wieteska S, editors. 3rd ed. London: BMJ Books; 2001.*

Signs and symptoms*

- Respiratory rate & effort - raised
- Heart rate - raised (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)
- Oxygen saturation reduced or may be unrecordable (poor perfusion)
- Temperature - raised (peripheral shutdown or any antipyretics given may mask this)
- Rigors
- Vomiting/abdominal pain/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 & drowsy;
  • older children/adults – difficulty walking/standing, drowsy, confused.

Some symptoms may be absent and the order in which they appear may vary.

Management (Time critical)

1. Open **airway**
2. High flow **oxygen** with assisted ventilation (as needed)
3. Correct A & B problems at scene then **DO NOT DELAY TRANSPORTATION** to nearest receiving hospital
4. **Give benzylpenicillin** (see below) **IN TRANSIT**
5. **Treat shock** with i.v. crystalloid if time allows: children - 20ml/kg repeated twice if necessary (max 60ml/kg) or adults - 500ml repeated up to a maximum of 2 litres. Check blood sugar and treat if necessary
6. Provide **hospital alert message** including age of patient
7. Repeat assessment and further management of ABCs as necessary en route.

Benzylpenicillin administration

- The illness may progress rapidly - the sooner benzylpenicillin is administered the better the outcome
- Dissolve benzylpenicillin in sterile water (as in table right)
- Give i.v. if access can be obtained easily, otherwise i.m.

Age	Dose	Volume	
		i.v. 600mg/10ml	i.m. 600mg/2ml
Less than 1 year	300mg	5ml	1ml
1-9 years	600mg	10ml	2ml
>9 years and adult	1200mg	20ml	4ml

The Rash

Classically bruised haemorrhagic type (purpuric), or may appear "flea bitten". In pigmented skin 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.**


Classic haemorrhagic rash
Courtesy of Dr A Riordan


Tumbler test


Petechial rash on conjunctivae
Courtesy of DA Warrell

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
- Up to 30% of cases **start** with a blanching pink rash which fades with pressure and then becomes purpuric.

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

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 undertaking airway management or if the patient coughed in their face.

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.

About Meningitis Research Foundation

Meningitis Research Foundation is a national registered charity whose vision is a world free from meningitis and septicaemia. On the basis of research and consultation, the Foundation produces guidance notes and protocols to promote best practice in the diagnosis and treatment of patients with these diseases. Along with a range of resources for patients, these can be obtained free of charge from our website or any of our offices. The Foundation has a **Free*fone* 24 hour helpline 080 8800 3344** operated by trained staff and qualified nurses to provide in-depth support and information.

www.meningitis.org

This resource has been developed in association with the Joint Royal Colleges Ambulance Liaison Committee

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