# Physical Signs in Children with Meningococcal Disease

| ORGAN SYSTEM | SEPSIS | MENINGITIS |
|---|---|---|
| Respiratory | ▲ Increased respiratory rate and work of breathing occur early, secondary to acidosis and hypoxia as circulatory failure develops | ▲ No changes early in disease<br>▲ Abnormal breathing patterns seen late with critically raised intracranial pressure (varies from hyperventilation to Cheyne-Stokes breathing or apnoea) |
| Cardiovascular | **Careful examination of this system is the key to recognition of sepsis. Clinical features of circulatory failure (shock) develop:**<br>▲ Tachycardia is an early and important sign<br>▲ Peripheral vasoconstriction results in pallor, cold hands and feet, and mottling<br>▲ Capillary refill time > 2 seconds, especially in conjunction with other signs, suggests shock<br>▲ BP is normal until late in sepsis. Hypotension is a pre-terminal sign in children | ▲ No changes early in disease<br>▲ Later, raised intracranial pressure leads to bradycardia and hypertension |
| CNS | ▲ Children have a normal conscious level until late in the illness and they may appear alert and responsive<br>▲ Hypoxia and hypoperfusion eventually lead to a decreased conscious level: this is a late and a pre-terminal sign in shock<br>▲ Neck stiffness and photophobia are not characteristic of sepsis | **CNS function most likely to be abnormal**<br>▲ Irritability, drowsiness, confusion and decreased conscious level as intracranial pressure rises. **Babies** may have a vacant expression/full fontanelle. **Teenagers** can become confused and combative<br>▲ Neck stiffness and photophobia are uncommon signs in early meningitis in young children. |
| Renal | ▲ Decreased urine output occurs early in shock | ▲ No change in meningitis |
| Death | Results from **cardiovascular failure (shock)** | Results from **raised intracranial pressure** |

**Normal Values of Vital Signs**
*Adapted from Advanced Paediatric Life Support: The Practical Approach (6th ed.)*

| Age | RR/min | HR/min | Systolic BP |
|---|---|---|---|
| Birth | 25-50 | 120-170 | 80-90 |
| 3 m | 25-45 | 115-160 | 80-90 |
| 6 m | 20-40 | 110-160 | 80-90 |
| 12 m | 20-40 | 110-160 | 85-95 |
| 18 m | 20-35 | 100-155 | 85-95 |
| 2 y | 20-30 | 100-150 | 85-100 |
| 3 y | 20-30 | 90-140 | 85-100 |
| 4 y | 20-30 | 80-135 | 85-100 |
| 5 y | 20-30 | 80-135 | 90-110 |
| 6 y | 20-30 | 80-130 | 90-110 |
| 8 y | 15-25 | 70-120 | 90-110 |
| 12 y | 12-24 | 65-115 | 100-120 |
| >14 y | 12-24 | 60-110 | 100-120 |

**RASH:** The rash of meningococcal disease can start as a blanching rash in up to a third of patients: remember to check for underlying signs of meningitis and sepsis in children who present with a maculopapular rash.

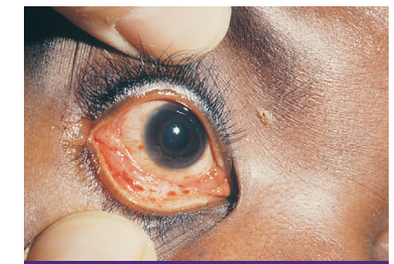
Patients with meningitis tend to have a more scanty (or absent) rash than those with sepsis. Ideally, the whole skin surface of a febrile patient without an obvious cause for fever should be checked.

† Courtesy: Dr A Riordan

Maculopapular rash with scanty petechiae. †

Classic purpuric rash.

Purpuric rash on dark skin.



† Courtesy: D A Warrell

Petechial rash on conjunctivae. †

**Benzylpenicillin dosage (BNF)**

(except in penicillin anaphylaxis)

Adult and child aged 10 or older: **1200 mg**

Child 1-9 years: **600 mg**

Infant: **300 mg**

Meningitis Research Foundation

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# Meningococcal Meningitis and Sepsis

## Wall chart

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