

## Terminology

Invasive meningococcal disease includes:

### 1) Meningococcal meningitis:

Infection and inflammation of the meninges caused by *Neisseria meningitidis*.

2) Meningococemia: Infection of the bloodstream caused by *Neisseria meningitidis*.

## MAIN RISK FACTORS

- Unimmunized or incompletely immunized individuals
- Primary or secondary immunodeficiency (congenital or acquired, such as asplenia/hyposplenia and auto-immune disease)

## INVESTIGATIONS

- Gold standard:** isolation of *N. meningitidis* from sterile body fluid (blood culture or CSF)
- CBC, electrolytes, CRP, glucose, creatinine, ALT: leukocytosis, electrolyte abnormalities, acute kidney failure
- Arterial blood gas: metabolic acidosis may be present
- If septic: lactate, PT, PTT, fibrinogen, d-dimers, CK
- Neuroimaging (head CT) if neurologic symptoms are present
- Lumbar puncture: CSF analysis and culture, gram staining, PCR

## MANAGEMENT

- Medical emergency** → Early administration of antibiotic therapy (do not delay for lumbar puncture)
- High dose IV Ceftriaxone pending susceptibility testing
- Dexamethasone: reduces neurological sequelae, morbidity & mortality
- Supportive care

## CLINICAL PRESENTATION

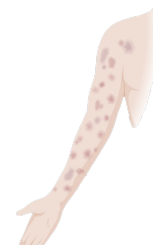
### History

- Sepsis** and/or septic choc
- Neurological** (meningitis) : fever, nausea, vomiting, headache, photophobia, difficulty concentrating, myalgias, impaired consciousness
- Dermatologic:** Petechial rash progressing to purpura fulminans (maculopapular rash progressing to blood filled blisters and eventually leading to infarction-related skin necrosis)
- Respiratory:** sore throat, coryza
- Cardiac:** myocarditis, heart failure
- Abdominal:** abdominal pain and gastroenteritis (acute abdomen)



### Physical exam

- Meningeal irritability:** positive Kernig and/or Brudzinski signs
- Vital sign changes often consistent with “**warm shock**”: bounding pulses, very low diastolic blood pressure with wide pulse pressure, tachycardia, diaphoresis
- Rash:** petechiae 1-2mm in diameter concentrated on trunk & lower portions of the body (can also present as large purpuric and ecchymotic lesions)



## COMPLICATIONS

### Lack of end organ failure:

- Renal insufficiency
- Adrenal infarction
- Disseminated intravascular coagulation

### Sensorineural hearing loss

- Pleuritis
- Endocarditis
- Amputation



## PREVENTION

- Isolation: droplet precautions until 24 hours of appropriate antibiotic therapy
- Notification to local Public Health department**
- Early antimicrobial chemoprophylaxis in close contacts: Rifampin, Ciprofloxacin or Ceftriaxone based on antimicrobial susceptibility
- Meningococcal conjugate vaccine and/or serogroup B meningococcal vaccine: immunoprophylaxis in previously vaccinated closed contacts should be considered

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