MENINGOCOCCAL DISEASE: MANAGEMENT - SCH

PRACTICE GUIDELINE ©

DOCUMENT SUMMARY/KEY POINTS

- Fever with petechiae or purpura is highly suggestive of meningococcal disease. Leg pain, cold extremities, and abnormal skin colour can be early signs
- Early recognition and prompt antibiotic treatment is essential
- Children become sick rapidly and can require large volumes of fluid resuscitation and inotropic support.
- Diagnostic investigations include blood culture, PCR, and serology. PCR can be performed after antibiotics have been administered
- Droplet transmission precautions should be taken for 24hrs after the administration of antibiotics
- Public Health should be notified urgently by phone of all clinically suspected cases on 9382 8333 during business hours and after hours via the hospital switchboard

CHANGE SUMMARY

- SCH document due for mandatory review.
- Rescinds SCH document SCH.C.16.M.3.
- Antibiotic recommendations updated in line with Therapeutic guidelines and CDNA National Guidelines for Public Health Units.
- Added table on SEALS testing
- Added table on Public Health Response in defined settings
- List of related documents updated

Approved by:	SCHN Policy, Procedure and Guideline Committee	
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Team Leader:	MAG Pharmacist	**Area/Dept**: Pharmacy

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READ ACKNOWLEDGEMENT

- All clinical staff: nurses and medical officers need to understand and acknowledge this document.

Clinical Features

Meningococcal disease usually presents as meningitis, septicaemia, or both. Meningococcal septicaemia can have a fulminant and rapidly fatal course.

The characteristic feature of meningococcal disease is a petechial or purpuric rash though initial symptoms can be non-specific (fever, muscle aches, vomiting). This rash with fever and drowsiness is highly suggestive of meningococcal disease. Up to one third of cases have a blanching pink macular or papular rash that may fade or become petechial. Some cases do not have any rash at presentation.

The classic features of meningococcal meningitis - petechial rash, meningism and decreased level of consciousness are relatively late signs. As well as non-specific signs of serious illness such as decreased alertness, decreased interaction and pallor, early signs of meningococcal disease in children include leg pain, vomiting, cold extremities and abnormal skin colour.

Less common presentations can be a septic arthritis, pneumonia or pharyngitis.

Children with non-specific febrile illnesses who are sent home from Emergency need regular review, either by their Local Doctor or in the Medical Day Unit and should return if they deteriorate or develop a rash.

Pre-Hospital Management

Treatment of suspected cases of meningococcal septicaemia with penicillin prior to transfer reduces mortality by half. GPs are advised to immediately treat and refer patients with an acute systemic febrile illness and any of the following: a petechial or purpuric rash, impaired level of consciousness, signs of meningeal irritation or a close contact of a patient with meningococcal disease.

Doses are:

- ***Benzyl penicillin 60mg/kg up to 2.4g IM or IV***
- OR in children > 1 month, hypersensitive to Penicillin:
    - ***Ceftriaxone 50mg/kg up to 2g IM or IV***

Initial Emergency Department/Ward Management

Children with suspected meningococcal disease should be assessed urgently and treated without delay. Large volumes of intravenous fluid support may be required as well as cardiorespiratory support with ventilation and inotropes.

High risk features are shock, metabolic acidosis, low white cell count, coagulopathy, hypotension and decreased level of consciousness.

Following stabilisation in ED, children not requiring Intensive Care Unit admission should be admitted under the General Paediatrician on call.

If a patient is suspected of developing meningococcal disease while on the ward, the same initial antibiotics and investigations should be performed in consultation with the treating team. Consideration should be given to discussion with the General Paediatrician on call if the patient is being cared for by another specialty.

Initial antibiotic treatment:

Initial antibiotic therapy for suspected meningococcal infection will be broad and consistent with empiric recommendations for severe sepsis (see Empiric antibiotic guidelines – SCH [1])

Table 1: Doses for empiric antibiotic treatment for suspected meningococcal infection

Vancomycin (IV infusion)

15mg/kg (max 750mg): every 6 hrs for children > 1 month; every 8 hrs for term neonates 7 days – 1 month; every 12 hrs birth to 7 days (refer to SCH Vancomycin guideline for more information and for doses for pre-term infants)

AND

Cefotaxime (IV or IM)

50mg/kg (max 2g): every 6 hours for children > 1 week and every 12 hrs for neonates birth to 1 week (refer to AMH Children's dosing companion)

OR

Ceftriaxone (IV or IM)

100mg/kg daily for children > 1 month (max 4g). Not recommended for neonates < 1 month. (refer to AMH Children's Dosing companion)

Empiric antibiotic therapy may be rationalised once the child is more stable and/or culture results with sensitivities are available.

Investigations:

- Blood culture (sensitivity of ~ 50% pre-antibiotics, 5% after antibiotics),
- Blood count, blood gas, glucose, electrolytes, coagulation profile, CRP, serology and PCR (very high sensitivity and specificity).
- Antigen tests are not reliable and throat swabs are not recommended due to the high prevalence of incidental carriage.
- Unless contraindicated, lumbar puncture should be performed if meningitis is suspected and it is safe to do so. LP may be deferred until after antibiotics and resuscitation (refer to "Bacterial Meningitis – Acute Management" guideline [2]).

Table 2: South Eastern Area Laboratory Services Summary of Diagnostic Tests [3]

	Culture	PCR	Serology
Timing	Early, before antibiotics	Early, before and after antibiotics commenced	Early, and repeat after 5-7 days if negative, equivocal, or low positive
Specimens	Blood, CSF	EDTA Blood, CSF	Clotted blood (red top tube) 5mL minimum
Time to results	Blood culture and CSF usually positive in 18-36hrs, culture confirmation 24 hrs later	Same or following normal working day	Routine runs 1-3 times per week depending on season
Interpretation	Non-pathogenic *Neisseria* in blood culture can be confusing until identification is confirmed	*Neisseria meningiditis* specific DNA is reported	IgM only reported, antibodies against outer membrane protein and antibody against group C capsular antigen
Warning: Interpret all tests in the clinical context of the patient	CSF gram stain is insensitive and the results can be misleading		IgM to group C capsular antigen may be due to recent immunisation

Be aware that CRP and WCC can be normal initially (or even low in severe meningococcal diseases) and therefore although these initial tests can help with the clinical picture, they could be potentially falsely reassuring.

Infection Control

Precautions for droplet transmission should be taken for the first 24 hours after treatment with antibiotics. This includes staff wearing a surgical type mask and single room isolation. With effective antibiotic therapy, meningococci usually disappear from the nasopharynx within 24 hours.

For more detail see:

- Australian guidelines for the Prevention and Control of Infection in Healthcare (2010) [4]
- Infection Control: Isolation and Transmission Based Precautions – SCH [5]

Public Health

Public health follow-up focuses on identifying the subset of 'higher-risk' contacts who require information and clearance antibiotics and vaccination in some instances. Other lower-risk contacts groups may be given information only. Public Health should be notified on clinical suspicion of cases of meningococcal disease. The disease is transmitted via droplets and has an incubation period of between 1 and 10 days, but commonly 3 to 4 days. Contacts requiring antibiotics to eradicate carriage include:

- **Household contacts** – Those who have lived in the same house (or dormitory type room) or were having an equivalent degree of contact in the 7 days prior to the onset of the case's symptoms;
- **Intimate kissing or sexual contacts** in the 7 days prior to the case's symptoms
- **Child-care** - Children and staff in childcare should have an equivalent degree of contact with the case as a household contact. As a guide, this should mean at least 4 hours/day on average or 20 hours in total in the 7 days prior to the onset of the case's illness. Child-care includes any situation where children under 5 years of age are cared for with other children away from home. This setting includes kindergartens and pre-schools (pre-primary);
- **Passengers** seated immediately adjacent to the case during long distance travel (>8 hours duration) by aeroplane, train, bus or other vehicle.
- **Healthcare workers** are rarely at risk, and only those who have come into direct contact with the nasopharyngeal secretions of a case during a procedure such as intubation without wearing a surgical mask or mouth-to-mouth resuscitation should be regarded as higher-risk contacts

Preferred clearance treatment for children is rifampicin. [6]

- Dose for children 1 month of age and older 10mg/kg (max 600 mg) 12 hourly for 2 days;
- Dose for infants < 1 month of age 5 mg/kg 12 hourly for 2 days.

Patients who are treated with benzyl penicillin alone also need to be treated to eradicate nasopharyngeal carriage.

Table 3: Treatment options for those who require clearance antibiotics[7]

Agent	Ceftriaxone	Ciprofloxacin	Rifampicin
Preferred agent for	Pregnant women Situations where access to and/or compliance with rifampicin and ciprofloxacin may be poor, such as in remote indigenous communities	Adults and children of all ages Women taking the oral contraception pill (OCP)	Young children
Dosage	Child under 12 years: 125 mg IM as 1 dose Adult: 250 mg IM, as 1 dose	Adult or child ≥12 yrs: 500 mg orally, as 1 dose Children aged 5–12 years 250 mg stat Children under 5yrs 30mg/kg up to maximum of 125 mg stat	Child [7]: Neonate <1 month: 5 mg/kg orally, 12-hourly for 2 days. Child ≥1 month: 10 mg/kg up to 600 mg orally, 12-hourly for 2 days. Adult: 600 mg orally, 12-hourly for 2 days
Advantages	97-98% effective in elimination of nasopharyngeal carriage Well tolerated Single dose No adverse reactions or drug interactions of importance	91-100% effective in elimination of nasopharyngeal carriage Single dose Oral	81-98% effective in elimination of nasopharyngeal carriage Oral, available in syrup
Disadvantages	IM Administration Painful and may require concomitant local anaesthetic Contraindications: Not for use in infants less than 4 weeks old	Contraindications: Previous allergy; Pregnancy/breast feeding; Age <12 years; Drug interactions; Allergic reactions, including anaphylaxis	2-day course – compliance Side effects: orange discolouration of soft contact lenses, tears and urine; gastrointestinal disturbance, dizziness, drowsiness, headache Contraindications: Severe liver impairment; Alcohol abuse; Pregnancy; Drug interactions including hormonal contraceptives, anticoagulants and anticonvulsants.

Table 4: Public health responses in defined settings in which a single case of invasive meningococcal disease has occurred – taken from CDNA National Guidelines for Public Health Units [7]

Settings	Clearance antibiotics	Vaccination	Information
Household and other higher-risk contacts of a case (refer above)	Yes	Yes	Yes
Childcare facilities (children and staff not high-risk contacts of a case)	No	No	Yes
Schools and universities	Only students who are household-like contacts of a case	Only students who are household-like contacts of a case	All other students in the same classroom (schools) or tutorial groups (universities).
Those exposed to a case after the onset of symptoms	No, unless meet other criteria for higher risk contacts	No	Yes
Those in seats directly beside a case during long duration travel (>8 hours)	Yes	No	Yes
Healthcare workers who have performed airway management (e.g. suctioning, intubation) of a case wearing a mask.	No	No	Yes
Sporting team and work contacts (including both shared office or open air settings)	No	No	Yes

Related documents

1. ***Empiric antibiotic guidelines – SCH***
   http://chw.schn.health.nsw.gov.au/o/documents/policies/policies/2012-7004.pdf

2. ***Bacterial Meningitis – SCH***
   http://chw.schn.health.nsw.gov.au/o/documents/policies/policies/2014-9001.pdf

3. ***Laboratory Diagnosis of Acute Invasive Meningococcal Disease, SEALS***,
   http://sesiweb.lan.sesahs.nsw.gov.au/seals/pdf/meningococcal.pdf

4. ***Australian Guidelines for the Prevention and Control of Infection in Healthcare (2010)***
   http://www.nhmrc.gov.au/guidelines-publications/cd33 ***Notification of Infectious***

5. ***Infection Control: Isolation and Transmission Based Precautions – SCH***
   http://chw.schn.health.nsw.gov.au/o/documents/policies/guidelines/2015-7005.pdf

6. ***Meningococcal Disease: Control guideline for public health units. NSW Health***
   http://www.health.nsw.gov.au/Infectious/controlguideline/Pages/meningococcal-disease.aspx

7. ***Invasive Meningococcal Disease. CDNA National Guidelines for Public Health Units. Jul 2014***
   http://www.health.gov.au/internet/main/publishing.nsf/Content/cdna-song-IMD.htm

8. ***The Australian Immunisation Handbook***. 2013. 10th edition.
   http://www.health.gov.au/internet/immunise/publishing.nsf/Content/Handbook10-home/$FILE/handbook-Jan2014v2.pdf

9. ***Diseases Under the Public Health Act 2010*** (SCHN Policy Coversheet)
   http://chw.schn.health.nsw.gov.au/o/documents/policies/policies/2012-9064.pdf

10. ***Infants and Children: Acute Management of Bacterial Meningitis: Clinical Practice Guideline. NSW MoH GL2013_013***
    http://www0.health.nsw.gov.au/policies/gl/2014/pdf/GL2014_013.pdf