The Public Health Management of Meningitis

Revised March 2005

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1. INTRODUCTION

The epidemiology of meningococcal infection has changed since the introduction of Meningococcal C (MenC) vaccination programme in December 1999. In England there has been a 97% reduction of meningococcal C disease among the teenagers and a 92% reduction in toddlers. Similar change has been reported in Scotland.

The policy focuses primarily on the Management of Meningococcal Infection and is based on “Guidelines for the public health management of meningococcal disease in the UK.” This guidance was produced by the Public Health Laboratory Service Meningococcus Forum and endorsed by the Public Health Laboratory Service, Public Health Medicine Environmental Group and the Scottish Centre for Infection and Environmental Health (SCIEH).

As with all infection control protocols, procedures discussed in this document may be modified according to the prevailing circumstances and must not be regarded as prescriptive.

There are three common presentations of meningococcal disease namely meningitis, septicaemia and a combination of both. Septicaemia without meningitis has the highest fatality rate (>20%). Rarely conjunctivitis may be caused by *Neisseria meningitidis* and can be a source of transmission.

In Grampian we would expect an average of 14 cases each year, around half are confirmed in the laboratory as being meningococcal. They present throughout the year, but are more frequent during the winter months. The disease may progress rapidly or in some cases may be preceded by a prodromal illness of several days.

2. ORGANISMS CAUSING MENINGITIS

Box 1. Causative Organisms

<table>
<thead>
<tr>
<th>Bacteria</th>
<th>Viruses</th>
</tr>
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<tbody>
<tr>
<td><em>Neisseria meningitidis</em></td>
<td>Viruses</td>
</tr>
<tr>
<td><em>Haemophilus Influenzae B (Hib)</em></td>
<td>Mumps, measles, and Enteroviruses</td>
</tr>
<tr>
<td><em>Streptococcus pneumoniae</em></td>
<td></td>
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<tr>
<td><em>Listeria</em></td>
<td></td>
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<tr>
<td><em>Escherichia coli</em></td>
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<tr>
<td><em>Mycobacterium tuberculosis</em></td>
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2.1 Serogroups of *N meningitidis*

There are seven different serogroups of *N meningitidis* which are A, B, C, W135, X, Y and ungroupable. Meningococci are classified according to the characteristics of the polysaccharide capsule, into serogroup, of outer membrane protein (OMP) into serotype and serosubtype. Of chromosomal DNA (using pulsed field gel electrophoresis (PFGE) or multi locus sequence typing (MLST) into genotype.

2. Personal communication - Scottish Meningococcal Reference Lab, 2003
Group B is the predominant strain in this country however, it should be remembered that most cases of meningitis in the United Kingdom are of viral origin.

Groups B and C are the prevalent strains in developed countries whereas group A can cause epidemics in less developed nations. Clusters due to W135 strain are rare.

3. **TRANSMISSION**

3.1 Droplets from the upper respiratory tract can transmit *Neisseria meningitidis* from one person to another. Transmission requires prolonged contact with an infected person. This can occur by either residing in the same household or by frequent mouth to mouth contact enabling the transfer of fresh saliva between persons.

Nasopharyngeal carriage is very common with about 15% of the population carrying any one of the strains. Carriage rates are highest in young adults and this is particularly so with populations living closely with each other e.g. military recruits. In this case carriage may rise to about 30%. Smokers also show higher carriage rates. The precise significance of carriage is not understood but it is thought to boost systemic immunity although carriage may also lead to clinical disease.

3.2 The incubation period for meningococcal infection varies between 2 and 10 days although is more commonly 3-5 days.

3.3 Young children are more likely to carry *Neisseria lactamica*, a non-pathogenic form that is thought to confer protection.

4. **SYMPTOMS**

The presentation may vary considerably. Classically there is a sudden onset of:

- fever
- intense headache
- nausea and possibly vomiting
- neck stiffness and photophobia may also be present.

There may be a petechial rash or a characteristic purpuric rash that does not disappear under pressure from a glass (the glass test). In the very young, many of these symptoms are modified but include:

- drowsy/listless
- irritable and dislikes being handled
- off feeds

The impression of a severely ill child is striking. Bulging of the anterior fontanelle may be evident. Delirium and coma are late symptoms but may occur earlier in the fulminating form of the disease. The sequence of occurrence of these clinical features is variable. The presentation is rarely as described in textbooks. The characteristic rash is a feature in only about 75% of cases and may be a later presentation.

5. **LABORATORY DIAGNOSIS**

There are a number of investigations, which will assist the laboratory in the diagnosis of meningococcal infection, and these include:

- Blood for culture
- Blood for PCR (EDTA or other unclotted blood specimen)
- Serum (on admission and 2 – 8 weeks later)
- Lumbar puncture (if the patients condition allows)*
- Aspirate from other sterile sites suspected of being infected (eg. joints) for microscopy, culture, PCR

*Lumbar puncture should be avoided in children where the clinician feels meningococcal infection is the most likely diagnosis*.

A diagnosis can be **confirmed** by:
- CSF being smear positive for Gram negative diplococci
- Positive culture or PCR from blood or CSF
- Positive Meningococcal antigen from blood, CSF or urine although the antigen for group B in CSF is weak and therefore not conclusive.

In culture/PCR negative cases, **presumptive** diagnosis can be made by:
- Detecting gram negative diplococci in rash aspirate
- Latex agglutination test on CSF
- Culture of *N meningitidis* from throat swab.

Collecting acute bloods within 2 – 5 days of onset and convalescent bloods 2 – 8 weeks post onset can provide a retrospective sero-diagnosis.
In culture negative cases of suspected meningitis, CSF characteristics can display features that may distinguish bacterial meningitis from viral or tubercular types (see Appendix 2).

6. **CASE MANAGEMENT**

If meningococcal infection is suspected **rapid hospitalisation is a priority**. Immediate administration of benzylpenicillin (IV or IM) before hospitalisation may reduce fatality and should be given if not contraindicated. Evidence demonstrating the benefit of giving pre-admission parenteral antibiotics is inconsistent, but **should not cause delay in hospital referral**.

**Box 2. Pre-admission treatment**

<table>
<thead>
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<th>Age Group</th>
<th>Dosage</th>
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<tr>
<td>Adults and children aged 10 years and over</td>
<td>1200mg</td>
</tr>
<tr>
<td>Children aged 1 to 9 years</td>
<td>600mg</td>
</tr>
<tr>
<td>Babies under 1 year of age</td>
<td>300mg</td>
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The only contraindication is a history of penicillin anaphylaxis (1:7000 to 1:25,000 of treated patients only.)

In these very unusual circumstances, consider **chloramphenicol** by injection.

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Dosage</th>
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<tbody>
<tr>
<td>Adults and children aged 12 years and over</td>
<td>1.2g</td>
</tr>
<tr>
<td>Children from 1 month - 12 years</td>
<td>25mg/kg</td>
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</tbody>
</table>

In very rare circumstances third generation cephalosporins (ceftaxime, ceftazidime, ceftriaxone) may be used.

7. **THE ROLE OF PUBLIC HEALTH**

7.1 **Notification**

The Consultant in Public Health Medicine (Communicable Disease & Environmental Health) [CPHM (CDEH)] has statutory responsibility for the investigation of cases of meningococcal infection and management of their contacts. **It is therefore, essential that the Health Protection Team be informed as soon as is practicable if meningococcal disease is suspected.**
7.2 **Cases requiring public health action**

**Confirmed case**

Clinical diagnosis of meningitis, septicaemia or other invasive disease (e.g. conjunctivitis) **AND** at least one of the following:

- *N meningitidis* isolated from normally sterile site,
- Gram negative diplococci in normally sterile site,
- Meningococcal DNA (PCR positive) in normally sterile site
- Meningococcal antigen in blood, CSF or urine

Meningococcal conjunctivitis requires public health action because it can lead to systemic disease.

**Probable case**

Clinical diagnosis of meningitis or septicaemia or other invasive disease where the physician and/or microbiologist, in consultation with the public health physician, considers that meningococcal infection is the most likely diagnosis.

7.3 **Cases not requiring public health action**

7.3.1 **Possible case**

Clinical diagnosis of meningitis or septicaemia or other invasive disease where the clinician and/or microbiologist, in consultation with the public health physician, considers that diagnoses other than meningococcal disease are at least as likely. This category includes cases that may have been treated with antibiotics but whose probable diagnosis is viral meningitis. In such cases, chemoprophylaxis for contacts is not indicated.

7.3.2 **Infection in non-sterile sites**

Isolation of meningococci from sputum or from swabs taken from nasopharynx or genital tract is not in itself an indication for public health action, as asymptomatic carriage in the respiratory and genital tracts is common. However, when assessed together with other clinical and microbiological parameters, a positive throat swab may increase the index of suspicion that this is a probable case.

7.4 **Minimum data set**

Details must be entered on the “Meningococcal Case Report Form” and should include the following:

- **Case**
  
  Name, date of birth, address, postcode, telephone number, GP details. Details of work place, college, school, nursery, pre-school or social groups.
  
  Date & time of onset, admission (name of ward) and reporting. Have pre-admission antibiotics been administered? MenC immunisation status and clinical presentation

- **Contacts**
  
  Name, date of birth (if known), address, telephone number and GP details. Type and extent of contact, type of antibiotic and dose, prescriber, date prescribed.

- **Notifier**
  
  Name and occupation

8. **MANAGEMENT OF CONTACTS**

8.1 The investigation and management of contacts is the responsibility of the CPHM (CD/EH). Details should be taken of individuals who have had sufficient contact with the case during the **7 days** prior to onset of illness, irrespective of their vaccination status. The risk of transmission is low with around 97% of cases being sporadic.
Contacts come under the following three categories:

- Contacts requiring chemoprophylaxis
- Contacts NOT requiring chemoprophylaxis
- Contacts where chemoprophylaxis is uncertain

Chemoprophylaxis should be given as soon as possible, ideally within 24 hours.

8.2 Contacts requiring chemoprophylaxis
- Household contacts such as family members, close intimate friends
- Intimate contacts such as boyfriends/girlfriends.
- Pupils in the same dormitory, students sharing the same kitchen in a hall of residence
- Individuals who have had transient close contact with a case but only if their mouth or nose has been directly exposed to large particle droplets/secretions from the respiratory tract of the case around the time of admission eg. during intubation.

8.3 Contacts NOT requiring chemoprophylaxis
- Staff and children attending same nursery/ crèche
- Students and pupils in the same school/ class/ tutor group
- Work or school colleagues
- Friends
- Residents of nursing/residential homes
- Kissing on cheek or mouth
- Sharing food or drink
- Attending same social function
- Travelling in next seat in plane, train, bus or car
- Kissing the body of a case
- Contacts of possible cases unless diagnostic category changes to ‘probable’ or ‘confirmed’
- Other patients in the ward where the index case stayed before diagnosis
- Contacts of cases of meningitis not caused by meningococcal disease or Hib

8.4 Chemoprophylaxis uncertain
It remains the decision of the CPHM to decide whether or not individuals who do not fall into the above categories will require prophylaxis.

The threshold for administration of antibiotics should be lowered for immunocompromised contacts as they may be at increased risk of disease.

8.5 Chemoprophylaxis in Special situations

8.5.1 Dispersal settings
Where close contacts have been identified but where that contact has now finished, eg individuals who slept in the same room on holiday, attempts should be made to arrange chemoprophylaxis within 7 days of dispersal.

8.5.2 Delayed diagnosis
If a delayed report of a case is notified, close contacts should be offered prophylaxis (and vaccine if appropriate) up to 4 weeks after the onset of illness.

8.6 Chemoprophylaxis for the index case
In order to eliminate carriage of *N meningitidis*, prophylaxis should be prescribed as soon as the patient is able to take oral medication unless the disease was treated with ceftriaxone.

8.7 Chemoprophylaxis for Healthcare Workers
Healthcare Workers (HCW’s) who are in contact with cases of meningococcal infection around the time of admission are at increased relative risk of disease in the 10 day period after exposure. HCW’s should take steps to reduce the possibility of exposure to large particle droplets by using closed suction systems and wearing facemasks and eye protection where there is a risk of secretions splashing into the face and eyes.

Chemoprophylaxis is only recommended for those whose mouth or nose has been directly exposed to large particle droplets/respiratory secretions of a probable or confirmed case around the time of
admission. This level of contact is unlikely unless undertaking airway management or the patient coughing respiratory分泌ions into the HCW’s face.

Providing general medical and nursing care are not an indication for chemoprophylaxis.

Exposure of the eyes to respiratory droplets is not an indication for chemoprophylaxis. The risk of meningococcal conjunctivitis and subsequently invasive disease is very low. Staff should be made aware of this risk and advised to seek medical attention should they develop conjunctivitis within 10 days of exposure.

9. CHOICE OF CHEMOPROPHYLAXIS

9.1 Rifampicin is the only antibacterial licensed for this purpose and is recommended for use in all age groups. Other drugs used are ciprofloxacin and ceftriaxone. Ceftriaxone must be given by injection. Written information about side effects and drug interactions should be supplied.

Inappropriate prescribing of chemoprophylaxis should be actively discouraged as such practice does more harm than good.

Box 3. Rifampicin Dosage

| Rifampicin should be taken orally for two days in the following dosage: |
| ADULTS AND CHILDREN OVER 12 YEARS | 600mg 12 hourly |
| CHILDREN 1 YEAR - 12 YEARS | 10mg/kg. 12 hourly |
| CHILDREN UNDER 1 YEAR | 5mg/kg. 12 hourly |

Rifampicin kits issued from pharmacy. For side effects etc see Appendix 3, Rifampicin Information Leaflet.

Box 4. Ciprofloxacin Dosage

| Ciprofloxacin may be used as an alternative for adults and children aged 5 years and above |
| ADULTS AND CHILDREN OVER 12 YEARS | 500mg orally as a single dose |
| CHILDREN 5 - 12 YEARS | 250mg orally as a single dose |

The advantages of Ciprofloxacin are that it is a single dose and it does not interfere with oral contraceptives. However, it may be followed by anaphylactic reaction and should not be given in pregnancy.

For side effects, etc see Appendix 4, Ciprofloxacin Information Leaflet.

Box 5. Ceftriaxone Dosage

| Ceftriaxone may be used for adults |
| ADULTS OVER 12 YEARS | 1 single 250mg IM injection |
| CHILDREN UNDER 12 YEARS | 1 single 125mg IM injection |

9.2 Chemoprophylaxis during pregnancy & breast feeding

Chemoprophylaxis is now recommended in pregnancy and for breastfeeding mothers who are identified as close contacts of a case. Rifampicin in the recommended doses or Ceftriaxone 250mg IM can be used.

Ciprofloxacin is not recommended.

10. IMMUNISATION FOR N. MENINGITIDIS GROUPS A, C Y & W135

Immunisation is recommended for contacts of a vaccine preventable strain of meningococcal disease who have received chemoprophylaxis. Vaccine may be given up to 4 weeks after the onset of the illness. The Health Protection Team will inform the relevant GP(s) to arrange this as appropriate. Regardless of the causative organism the opportunity should be taken to ensure that all contacts under the age of 25 have been offered immunisation against meningococcal serogroup C infection. See Appendix 6 for Immunisation Protocols.
11. CLUSTER/OUTBREAK MANAGEMENT

Clusters/outbreaks should always be discussed with the CPHM and Health Protection Scotland (HPS). Only broad principles of management are given here.

11.1 Cluster in an Educational Institution

Most cases of meningococcal disease are sporadic. When two or more confirmed (or probable) cases of meningococcal disease of the same strain (or thought to be of the same strain) occur in the same educational institution within a four-week period, it is treated as a cluster. It is not necessary to wait for microbiological confirmation of probable cases before taking Public Health action. The Outbreak Plan will be initiated at the discretion of the CPHM.

Two possible cases or two confirmed cases caused by different strains are regarded as two sporadic cases.

It is not advised to close schools, colleges, universities etc.

11.2 Cluster in the Community

Clusters in the wider community are more difficult to define. Population boundaries can be difficult to set for intervention purposes but are often defined by age group or geography. Community intervention will be at the discretion of the CPHM. The Outbreak Plan will be initiated by the CPHM.

11.3 Administration of Chemoprophylaxis

The administration of chemoprophylaxis during a cluster/outbreak will depend largely on the location and social groups involved.

The decision regarding the distribution of chemoprophylaxis rests with the CPHM.

- **Cluster in pre-school groups/primary schools**
  
  Both staff and children would normally be offered chemoprophylaxis.

- **Cluster in secondary schools/colleges/universities**
  
  If it is possible to define a clear subgroup of which the cases are part, chemoprophylaxis would normally be offered to that subgroup.

  If a subgroup cannot be defined then a decision about offering chemoprophylaxis to the whole institution will be required. **This is the responsibility of the CPHM and the Outbreak Control Team.**

  If the case(s) were confirmed as a vaccine preventable strain of the infection then a programme of vaccination would need to be implemented for all those who had received chemoprophylaxis (Appendix 6.)

  Advice should sought from HPS.

11.4 Responsibilities

- The CPHM will provide a letter for the head of the institution to inform parents/students of the situation

- Pharmacy will supply appropriate antibiotics, vaccines and medicine information sheets

- Public Health and Community Medical and Nursing staff will deliver medicines/vaccines/information

- Informed consent would be required from those being offered chemoprophylaxis

Aberdeen University, Robert Gordon University and Aberdeen College all have local communication policies to facilitate the management of such an incident. Copies of these policies are also held in the Health Protection Team office.
12. COMMUNICATION

Key personnel should be kept up to date with relevant aspects of all cases of meningococcal disease in Grampian.

- CPHM
- Clinicians
- Health Protection Nurse Specialists
- GP(s) (GMED)
- NHS 24
- Corporate Communications

At the discretion of the CPHM, it may be necessary to involve other individuals and keep them briefed of the unfolding situation. This list is not exhaustive.

- Head of Institution (eg school, university etc)
- Parents (with advice from CPHM)
- Education Authority
- Pharmacy (when mass prophylaxis is intended)
- Director of Public Health
- HPS (if cluster is suspected)
- Voluntary Groups (eg Scouts, Brownies etc)

13. PRESS & MEDIA ENQUIRIES

The media have an active interest in all cases of meningitis. In line with the Data Protection Act, it is the Public Health Unit’s policy not to refer to individual cases or reveal identities of index patients or contacts. Often the media will have this information from other sources but statements should be considered carefully and be restricted to Public Health information.

It is important to involve Corporate Communications Team from the outset in order that a press officer can take the lead role in handling the media. It is possible that enquiries from the press may be directed to On Call staff out of hours and these calls should be directed to the Press Officer on call (Appendix 1.)

14. MENINGITIS CAUSED BY OTHER ORGANISMS

14.1 Invasive *Haemophilus Influenzae* type B infection (Hib)

Hib is a bacterial infection mainly affecting pre-school children, but older children or even adults may rarely be affected. Hib is different from non-capsulate forms of *Haemophilus influenzae*, which more commonly cause respiratory tract infections.

Hib causes a range of invasive diseases including:

- meningitis (often accompanied by bacteraemia)
- epiglottitis
- septic arthritis, osteomyelitis
- cellulitis
- pneumonia
- pericarditis

Infection may provide immunity although repeat infections have been described in the literature.

The incubation period is unknown, but is probably around 2-4 days.

Public health action should be taken in response to any case of invasive *Haemophilus Influenzae* Type B infection.
14.1.1 Immunisation against Hib

Immunisation against Hib at 2, 3 and 4 months of age was introduced to the UK’s routine primary immunisation schedule in 1992. As a result, the incidence of Hib disease fell by 98%.

However, from 1998, the enhanced surveillance of Hib disease, by SCIEH and the Public Health Laboratory Service (PHLS) identified a gradual increase in cases, mostly in children under 4 years of age, accordingly a second catch-up campaign took place during 2003.

During August 2004 new vaccines were introduced into the UK routine immunisation programme for infants, pre-school children and teenagers. The new combined vaccines contain inactivated polio (instead of live oral polio) and a five component acellular pertussis vaccine (instead of whole cell pertussis). There are 4 new combined vaccines:

- **DTaP/IPV/Hib** - for the primary course
- **DTaP/IPV and dTaP/IPV** - for the pre-school booster
- **dT/IPV** - for the teenage booster.

Single antigen Hib vaccine continues to be available.

Children **under 10 years** of age, who have never received the primary childhood vaccinations, should receive 3 doses of DTaP/IPV/Hib vaccine.

Children previously immunised with DTP/Polio but not Hib should:

- If less than age 1 – receive 3 doses of single Hib vaccine at monthly intervals
- If between ages 1 and 10 years - receive 1 single dose of Hib vaccine.

14.1.2 Diagnosis

This is usually done by isolation of the organism from blood, CSF or target site e.g. throat swab or by clinical diagnosis. Diagnosis can also be made by demonstration of Hib antigen by latex agglutination or PCR.

14.1.3 Management of the Case

**Chemoprophylaxis:** The index case should be given chemoprophylaxis prior to discharge from hospital.

**Immunisation:** Children up to the age of 10 years who have invasive Hib disease and have previously received no primary immunisations, should be immunised with 3 doses of DTaP/IPV/Hib, as recurrence of Hib infection can occur. Children up to the age of 10 years, who are partially immunised against Hib, should complete their course of immunisation against Hib, as disease does not necessarily confer immunity, especially in the very young.

Individuals who have been previously fully vaccinated against Hib but then acquire Hib infection later should have their **convalescent antibody levels** measured and **may** require immunisation with booster dose of Hib vaccine. Where antibody testing is not possible an additional dose of Hib vaccine **should** be given.

14.1.4 Management of Contacts

Household contacts of a case of invasive Hib disease have an increased risk of contracting the infection, with unimmunised or incompletely immunised children less than 4 years of age at greatest risk. However, older unimmunised children may still be vulnerable. Chemoprophylaxis aims to eradicate carriage amongst close household contacts to reduce the risk of further cases, and immunisation is used to develop/boost individual immunity.

**Chemoprophylaxis:** Contact tracing for household contacts should extend to 5 days before the onset of illness in the index case and be limited to those who have lived under the same roof as the index case during this time.

- If any individual in the household of a case is at risk (i.e. children under 4 years or individuals of any age who are immunosuppressed or asplenic) **regardless of immunisation status**, the index case and **ALL** household contacts should be given Rifampicin (see Box 7).
- If there have been 2 cases of invasive Hib infection within 120 days in a playgroup, nursery or crèche all contacts (including teachers) should receive chemoprophylaxis.
Box 7. Rifampicin Dosage (Hib)

<table>
<thead>
<tr>
<th></th>
<th>Adults</th>
<th>Children over 3 months</th>
<th>Infants aged 1-3 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rifampicin</td>
<td>600mg</td>
<td>20mg/kg body weight</td>
<td>10mg/kg body weight</td>
</tr>
<tr>
<td>Dosage (Hib)</td>
<td></td>
<td>(maximum dose 600mg/day)</td>
<td></td>
</tr>
</tbody>
</table>

**NB:**

- This regimen is different from that for meningococcal infection
- Chemoprophylaxis is not recommended under the age of 1 month because of passive protection conferred by maternal antibodies and the dose of Rifampicin required to eliminate carriage may be toxic.
- Contacts should be advised of the side effects and contraindications of Rifampicin therapy. A Patient Information Leaflet is available (see Appendix 3.)

Immunisation: contacts should receive the following

- Children under 10 years of age who have not received any primary immunisations (i.e. Hib, Diphtheria, Tetanus, Polio, and Pertussis) should receive 3 doses of DTaP/IPV/Hib vaccine.
- Children who are partially immunised against Hib should complete the course.
- Children who were previously immunised with DTP/Polio but not Hib should:
  - Less than age 1 - receive 3 doses of single Hib vaccine at monthly intervals.
  - 1 - 10 years of age - receive 1 single dose of Hib vaccine.
- If a case occurs in a playgroup, nursery, crèche or school, the opportunity should be taken to identify and vaccinate any unimmunised children under 10 years of age.

14.2 Streptococcus Pneumoniae
This organism would not normally require contact tracing and prophylaxis. Community information should be available if required.

14.3 Mycobacterium Tuberculosis
This is extremely rare and if reported would be acted on individually by the Health Protection Team in consultation with the microbiologist and chest physician.

14.4 Viral Meningitis
This is the commonest type of meningitis and can be caused by many different types of viruses, eg enteroviruses, mumps etc. Spontaneous recovery occurs in almost all cases. Viral meningitis is not notifiable in Scotland. Contact tracing and chemoprophylaxis are not required.

14.5 Other rare organisms needing no community action include:
- Leptospira species
- Listeria monocytogenes
- Enterobacteriaceae
- Group B streptococci.
- Pasteurella multocida
- Viruses of different types
CONTACT PERSONNEL

Health Protection Team, NHS Grampian 01224 558520

- Dr, Helen Howie, CPHM
- Dr Diana Webster, CPHM
- Fiona Browning, Health Protection Nurse Specialist
- Jayne Leith, Health Protection Nurse Specialist

On-Call Staff all available through GUHT switchboard 0845 456 6000

- Public Health Doctor
- Infectious Disease Physician
- Paediatrician
- Microbiologist
- Corporate Communications (ask for pager number)

Corporate Communications 01224 554400

- Out of hours number 07699 716678

When calling out of hours leave a message and the Communications Officer on call will phone back.

Other relevant numbers required by the On-call Public Health Doctor will be available in the Public Health On-call Pack.

Health Protection Scotland 0141 300 1100
Meningitis Trust Helpline 0845 6000 800
Meningitis Research Foundation Helpline 080 8800 3344
## CSF PARAMETERS

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>No Infection</th>
<th>Type of Meningitis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Clear</td>
<td>Bacterial</td>
</tr>
<tr>
<td>Appearance</td>
<td>Turbid/purulent</td>
<td>Clear/opalescent</td>
</tr>
<tr>
<td>Leucocyte count (x10⁶/l)</td>
<td>10-2000</td>
<td>10-500</td>
</tr>
<tr>
<td>Usual count</td>
<td>&gt;1000 (not always conclusive, if any doubt do PCR)</td>
<td>&lt;200</td>
</tr>
<tr>
<td>Type</td>
<td>Lymphocytes</td>
<td>Neutrophils (neutrophils initially)</td>
</tr>
<tr>
<td>Protein (g/litre)</td>
<td>0.15-0.4</td>
<td>0.5-5.0</td>
</tr>
<tr>
<td>Glucose (mmol/litre)</td>
<td>2.5 - 5.5</td>
<td>Very low</td>
</tr>
<tr>
<td>Gram stain</td>
<td>No organisms</td>
<td>Usually present</td>
</tr>
</tbody>
</table>
RIFAMPICIN INFORMATION SHEET
For Contacts of Meningococcal Infection

The antibiotic you have been prescribed is called Rifampicin, which is recommended for close contacts of meningococcal infection. It comes as either tablets or syrup and is suitable for all ages.

Rifampicin must be taken twice a day for 2 days (morning and evening); the instructions will be written clearly on the label. You may have extra syrup left over, which should be returned to your pharmacist for safe disposal.

As the course is short it is unusual for individuals to experience severe side effects, but they include:
- Body secretions such as urine, sputum and tears can be coloured orange/red and may permanently stain soft contact lenses.
- Upset tummy, diarrhoea and nausea
- Skin flushing and itching with or without a rash

Important information
Rifampicin reduces the effect of the oral contraceptive pill. Additional contraception (e.g., condoms) should be used until 4 weeks after the course of Rifampicin has been completed. Because of the variety of contraceptive pills and the different ways in which Rifampicin can interact with them you should seek advice from your Family Planning provider/GP.

Rifampicin should not be taken if:
- You have a history of allergy to Rifampicin
- You are taking anticonvulsants (reduced plasma level)
- You are taking anticoagulants (reduced anticoagulant effect)
- You are jaundiced

Rifampicin may also interact with:
- diabetic medication (reduced effect)
- beta blockers (reduced effect)
- calcium channel blockers (reduced plasma concentration)
- thyroid hormone (increased requirement)
- ACE inhibitors (reduced effect)
- Methadone (reduced effect)

If you think you are taking medicines that fall into the above groups, please talk to your GP.

You should avoid drinking any alcohol when taking Rifampicin.

Please also read the information leaflet that comes with your medicine. If you require further information please contact your GP or pharmacist.
RIFAMPICIN INFORMATION SHEET

For Contacts of Haemophilus Influenzae type B Infection (Hib)

The antibiotic you have been prescribed is called Rifampicin, which is recommended for close contacts of Haemophilus Influenzae type B infection (Hib). It comes as either tablets or syrup and is suitable for all ages.

**Rifampicin must be taken once a day for 4 days**: the instructions will be written clearly on the label. You may have extra syrup left over, which should be returned to your pharmacist for safe disposal.

As the course is short it is unusual for individuals to experience severe side effects, but they include:
- Body secretions such as urine, sputum and tears can be coloured orange/red and may permanently stain soft contact lenses.
- Upset tummy, diarrhoea and nausea
- Skin flushing and itching with or without a rash

**Important information**

Rifampicin reduces the effect of the oral contraceptive pill. Additional contraception (eg condoms) should be used until 4 weeks after the course of Rifampicin has been completed. Because of the variety of contraceptive pills and the different ways in which Rifampicin can interact with them you should seek advice from your Family Planning provider/GP.

**Rifampicin should not be taken if:**
- You have a history of allergy to Rifampicin
- You are taking anticonvulsants (reduced plasma level)
- You are taking anticoagulants (reduced anticoagulant effect)
- You are jaundiced

**Rifampicin may also interact with:**
- diabetic medication (reduced effect)
- beta blockers (reduced effect)
- calcium channel blockers (reduced plasma concentration)
- thyroid hormone (increased requirement)
- ACE inhibitors (reduced effect)
- Methadone (reduced effect)

If you think you are taking medicines that fall into the above groups, please talk to your GP.

You should avoid drinking any alcohol when taking Rifampicin.

Please also read the information leaflet that comes with your medicine. If you require further information please contact your GP or pharmacist.
CIPROFLOXACIN INFORMATION SHEET

The antibiotic you have been prescribed is called Ciprofloxacin, which is recommended for close contacts of meningococcal infection.

It comes in tablet form and you will be given either one or two tablets to be taken as a one-off dose and therefore it is unusual to experience serious side effects.

It is important that you drink plenty fluid for the rest of the day after taking this antibiotic.

**Side effects of Ciprofloxacin include:**

- Upset tummy, diarrhoea and nausea
- Tiredness
- Facial swelling
- Very rarely, breathing difficulties may be associated with the facial swelling. **You must seek medical attention urgently if this occurs.**

**Ciprofloxacin should not be taken if:**

- You have previously had a reaction to Ciprofloxacin
- You are pregnant

Please tell the Public Health Doctor or Nurse if either of the above apply to you and they will arrange an alternative medicine.

If you require further information, please contact your GP or pharmacist.
Contacts of *N meningitidis* sero-group A
Bivalent (A & C) or quadrivalent (ACWY) vaccine should be offered to all close contacts above the age of 2 months.

Cases of *N meningitidis* sero-group A
Convalescent immunisation is not recommended.

Contacts of *N meningitidis* sero-group C
MenC vaccine should be offered to:
- All previously unimmunised close contacts of all ages. An additional dose is advised for babies less than 2 months old, who should then complete the usual primary immunisation course, i.e. 2, 3 and 4 months of age.
- Cases of confirmed serogroup C diseases that have previously been immunised with MenC (or polysaccharide) vaccine. (A sample of convalescent serum should be taken prior to immunisation and sent to PHLS Meningococcal reference unit as part of investigation of vaccine failure.

Previous serogroup C disease is not a contraindication to vaccination.

Contacts of *N meningitidis* sero-group W135
Quadrivalent vaccine should be offered to close contacts above the age of 2 years. Vaccine is not effective in children younger than this.

Cases of *N meningitidis* sero-group W135
Convalescent immunisation is not recommended.

**ALL SERO-GROUPS**
The opportunity should be taken to recommend MenC vaccination to all unimmunised contacts under the age of 25.
RIFAMPICIN STOCKS

The main supplies of Rifampicin are held at:

• Central Pharmacy, Aberdeen Royal Infirmary
• A&E, Dr Grays Hospital, Elgin.

Further emergency supplies are held at:

• The Infection Unit, Aberdeen Royal Infirmary
• Preparation Room, Medical/Surgical Wards, Royal Aberdeen Children’s Hospital

• Aboyne  Aboyne Hospital
• Banff  Chalmers Hospital (Outpatients)
• Buckie  Seafield Hospital (A&E)
• Fraserburgh  Fraserburgh Hospital (Outpatients)
• Huntly  Jubilee Hospital (Outpatients)
• Insch  Insch Hospital
• Inverurie  Inverurie Hospital (Casualty, Allan Ward)
• Keith  Turner Memorial Hospital
• Peterhead  Peterhead Community Hospital (Outpatients)
• Stonehaven  Kincardine Community Hospital (Arduthie Unit)
• Turriff  Turriff Hospital (Outpatients)
• GMED  David Anderson Building, Foresterhill Site.
Dear Parents

As you may be aware there has been a suspected case of Meningococcal Infection at the school.

This disease is not particularly infectious and it is unusual for there to be more than one case. All family and very close contacts within the risk period have been identified and given a short course of antibiotics. Although it is very unlikely that there will be an ongoing problem we would ask you to be extra vigilant. If your child shows symptoms of infection it is important to seek medical help without delay.

The symptoms of Meningococcal disease do vary but you should look out for the following:

- Fever
- Vomiting
- Severe malaise
- Headaches
- Stiff neck
- Visual discomfort in bright light
- Possibly a rash of small red spots or perhaps suggestive of bruising.

Should you require further information please contact your general practitioner or get in touch with the Health Protection Team on the above telephone number.

Yours sincerely,

Consultant in Public Health Medicine