Meningococcal Disease

Investigative Guidelines

November 2016

1. DISEASE REPORTING

1.1 Purpose of Reporting and Surveillance

1. To identify persons who have been significantly exposed to a person with meningococcal infection, in order to recommend antibiotic prophylaxis and to inform them about signs and symptoms of illness.
2. Under very rare circumstances, to recommend prophylactic immunization in a defined population or community.

1.2 Laboratory and Physician Reporting Requirements

Physicians and others providing health care must report confirmed or suspected cases to the Local Health Department (LHD) by telephone within 24 hours. If LHD staff are unreachable, they must contact the Oregon Public Health Division (PHD).

Laboratories are required to report within 1 working day, and to submit all isolates from normally sterile sites to the Oregon State Public Health Laboratory (OSPHL).

1.3 Local Health Department Reporting and Follow-Up Responsibilities

1. Report all confirmed and presumptive (but not suspect) cases (see definitions below) to PHD within 24 hours of initial physician/lab report.
2. Begin follow-up investigation within 24 hours.
3. Identify significant contacts and recommend prophylaxis within 24 hours of report.
4. If the case is lab-confirmed, make sure that the isolate is forwarded to the OSPHL.

2. THE DISEASE AND ITS EPIDEMIOLOGY

2.1 Etiologic Agent

Neisseria meningitidis—a Gram-negative diplococcal bacterium with nine serogroups that have been frequently associated with systemic disease: A, B, C, D, X, Y, Z, 29E, and W135. Four other serogroups (H, I, K, and L) rarely cause invasive disease. Serogroups B, C, and Y each account for about 1/3 of disease in the United States[1] while in Oregon serogroup B makes up 55% of cases.

2.2 Description of Illness

Disease is characterized by acute onset of fever, headache, weakness, hypotension, and rash. The rash may be initially urticarial, maculopapular, or petechial, and often appears in areas where elastic in underwear or socks applies pressure to the skin, or in the fingernail beds. Petechial hemorrhage is particularly common in the mucous membranes of the soft palate and conjunctiva. Invasive disease may occur without signs of meningitis.

In infants and small children, fever and vomiting are often the only symptoms. The classic triad of fever, neck stiffness, and altered mental status occurred in only 27% of patients with invasive meningococcal in a Dutch cohort.[2] All clinical illnesses associated with *N. meninigitidis* are significant and warrant investigation. In the absence of associated invasive disease, finding *N. meningitidis* in sputum is not considered a remarkable event, and is not reportable. In addition to the more common presentations of bacteremia and meningitis, *N. meningitidis* can cause pneumonia or primary meningococcal conjunctivitis.

The exact mechanism allowing the penetration of meningococci from the nasopharyngeal membranes is unknown, but a recent upper respiratory tract infection may facilitate invasion. Factors that increase carriage and disease risk include crowded living conditions (like army barracks and college dormitories) and either primary or secondary tobacco smoke exposure. Those with complement deficiencies and anatomic or functional asplenia are at especially high risk of meningococcal disease.

2.3 Reservoirs

Humans are the sole reservoir.

2.4 Modes of Transmission

Transmission is by direct exposure to droplets or direct contact with discharges from the nose or throat of a colonized person — symptomatic or otherwise. It is important to distinguish colonization from disease. Colonization is common, but invasive disease is very rare. Surveys of household or other contacts of cases reveal that 5%–25% of these persons may carry *N. meningitidis* in the nasopharynx. Most individuals are carriers at some point in their lives; that carriage can be chronic, intermittent, or transient. Disease incidence is highest in late winter to early spring. The burden of invasive meningococcal disease is typically highest in the very young (those 0–4 years of age), with a second, lower peak in incidence in young adults. Close contacts of cases (e.g. household members or day-care contacts) are at increased risk of becoming colonized and then developing illness. The attack rate for household contacts of cases is 0.3–1% (some 300–1,000 times the rate for the general population). For persons exposed to a case during the case's period of communicability (see below), the risk of developing symptomatic illness is highest during the 10-day period following onset of illness of the first case. (An elevated risk may extend for up to 60 days.)

2.5 Incubation Period

Usually 3 to 4 days, but may range from 2 to 10 days

2.6 Period of Communicability

Persons are infectious as long as meningococci are present in discharges from the nose or pharynx. Cases are probably most infectious during the 3 days prior to onset of symptoms, and are considered no longer communicable 24 hours after initiation of treatment or chemoprophylaxis with appropriate antibiotics. Those exposed 7 or more days before onset of illness in the case are not at significantly increased risk. Depending on the antimicrobials used, therapy for invasive disease may not eradicate the organism from the nasopharynx, and chemo-prophylaxis may also be required (see §5.4.3).

2.7 Treatment

Third-generation cephalosporins including ceftriaxone and cefotaxime administered intravenously at high doses are the drugs of choice for invasive disease. Alternatives include penicillin, meropenem, or fluoroquinolones.[3,4]

Five to seven days of antimicrobial therapy is adequate.

3. CASE DEFINITIONS, DIAGNOSIS AND LABORATORY SERVICES

3.1 Confirmed Case Definition

- Isolation of *N. meningitidis* from a normally sterile body site (e.g., blood or CSF, or less commonly, synovial, pleural, or pericardial fluid) or from purpuric lesions; or
- Detection of *N. meningitidis*-specific nucleic acid in a specimen obtained from a normally sterile body site (e.g., blood or CSF), using a validated polymerase chain reaction (PCR) assay.

3.2 Presumptive Case Definitions

- Detection of *N. meningitidis* in formalin-fixed tissue by immunohistochemistry (IHC), or in CSF by latex agglutination; or.
- Detection of Gram-negative diplococci, not yet identified, from CSF
- Consist signs and symptoms occurring within 2–10 days of contact with a confirmed case during the period of communicability.

3.3 Suspect Case (*not* reportable to Oregon PHD)

Any person with an undiagnosed compatible illness, with or without signs or symptoms of meningeal irritation (see §2.2).

3.4 Services Available at the Oregon State Public Health Laboratories

OSPHL will confirm the identification and serogroup of *N. meningitidis* isolates. Pure isolates should be sent on appropriate media that support the growth of the organism (e.g., chocolate agar). All specimens must be properly packaged in double containers with absorbent material around them and the

Bacteriology/Parasitology form. These specimens should not be sent with cold packs. **All isolates of *N. meningitidis* obtained from a normally sterile site must be sent to the OSPHL**.

4. ROUTINE CASE INVESTIGATION

4.1 Case Interview

Interview the case (or parents) and others who may be able to provide pertinent information.

1. **Identify Source of Infection**

   Often not possible, because of the high percentage of people who carry the organism. However, it is useful to ask whether any household, daycare, or other close contacts have recently had an illness suggestive of meningococcal disease.

2. **Identify Potentially Exposed Persons**

   Obtain the name, address, and telephone number of all persons who have had significant exposure to the case during the communicable period. These include:
   - all persons who have spent at least 4 hours (cumulatively, within 7 days of index patient's onset) in close, face-to-face association with the case, (e.g., household members, day-care contacts, cellmates); and
   - anyone directly exposed to the patient's nasopharyngeal secretions (e.g., via kissing, mouth-to-mouth resuscitation, intubation, or nasotracheal suctioning). Health care workers who have not had direct contact with the case's nasopharyngeal secretions are not at increased risk, and prophylaxis is not indicated.

4.2 Culturing of Exposed Persons

While sometimes suggested by well-meaning persons as a means to identify carriers, this is not a useful exercise.

4.3 Environmental Evaluation

Generally, none, although in outbreak settings an investigation may be warranted to identify environmental factors (disinfection practices, ventilation patterns, etc.) that may favor droplet transmission.

5. CONTROLLING FURTHER SPREAD

5.1 Education

Potentially exposed persons should be instructed to watch for fever, rash, lethargy, irritability, headache, loss of appetite, or vomiting. Should signs or symptoms develop within the next two weeks, they should seek medical care

immediately. They should be advised that an elevated risk may persist for 60 days.

5.2 Isolation

In addition to standard precautions, hospitalized cases should be placed under droplet precautions until at least 24 hours after initiation of antibiotic treatment or prophylaxis.

5.3 Case Follow-up

Some of the antibiotics commonly used for treatment do not reliably eradicate nasopharyngeal colonization. Unless rifampin, ceftriaxone or ciprofloxacin (which are effective against colonization) were used, the patient should also be chemoprophylaxed with an effective antibiotic before hospital discharge.

5.4 Protection of Contacts

1. Passive Immunization

None.

2. Active Immunization

ACIP recommends routine vaccination with quadrivalent (contains antigens from serogroups A, C, Y, andW-135) meningococcal conjugate vaccine (MenACWY-D (Menactra®) licensed in 2005; or MenACWY-CRM (Menveo®) licensed in February 2010) for all persons 11–21 years of age. Meningococcal vaccine is also recommended for persons 2 months to 55 years of age who are at increased risk for the disease due to complement deficiency, travel to or residence in a country where meningococcal disease is hyperendemic or epidemic, or inclusion in a defined risk group during a community or institutional outbreak.

The conjugate vaccines are preferred to the quadrivalent meningococcal polysaccharide vaccine (MPSV4) in all persons ≤55 years of age. Neither of the two meningococcal conjugate vaccines are approved for use in persons >55 years of age; high-risk persons >55 years old may receive MPSV4 (Menomune®). None of the quadrivalent vaccines protect against serogroup B disease (see below for a discussion of serogroup B vaccination. Vaccination may be useful when a significant outbreak of disease due to serogroup A, C, Y, or W135 is continuing in a defined population, e.g., school, institution, or community.

See tables below for specific recommendations regarding vaccines and schedules for the general population (Table 1), persons aged 2–23 months at increased risk (Table 2), and persons aged ≥2 years at increased risk (Table 3).[1,5] For up-to-date vaccination recommendations, visit: *http://www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/mening.html*

Table 1. Meningococcal vaccination recommendations for persons without increased risk for meningococcal disease, non-group B meningococcus, ACIP (2013)

Age Group	Vaccine	Recommendation
2 mos – 10 yrs	None	Not routinely recommended; see table 2 for persons at increased risk
11–21 yrs	MenACWY-D (Menactra®) or MenACWY-CRM (Menveo®)	Primary: • Age 11–12 yrs, 1 dose • Age 13–18 yrs, 1 dose if not vaccinated previously • Age 19–21 yrs, not routinely recommended but may be administered as catch-up vaccination for those who have not received a dose after their 16th birthday Booster: • 1 dose recommended if first dose administered before 16th birthday
22–55 yrs	None	Not routinely recommended.
≥56 yrs	MPSV4 (Menomune®)	1 dose

Table 2. Summary of recommendations for non-group B meningococcal vaccination in children aged 2–23 months at increased risk for meningococcal disease, ACIP (2013)

Vaccine	Age of primary vaccination	Booster doses*	Indicated for infants who:
MenACWY-CRM (Menveo)	2, 4, 6, and 12 months	1st booster 3 years after primary series Additional boosters every 5 years	• Have complement component deficiencies • Have functional or anatomic asplenia (including sickle cell disease) • Are in the risk group for an outbreak for which vaccination is recommended • Are traveling to or residing in regions where meningitis is epidemic or hyperendemic
MenACWY-D (Menactra)	9 and 12 months†	1st booster 3 years after primary series Additional boosters every 5 years	• Have complement component deficiencies • Are in the risk group for an outbreak for which vaccination is recommender • Are traveling to or residing in regions where meningitis is epidemic or hyperendemic
Hib-MenCY-TT (MenHibrix)	2, 4, 6, and 12–15 months	1st booster (using MenACWY-CRM or MenACWY-D¶) 3 years after primary series Additional boosters (using MenACWY-CRM or MenACWY-D¶) every 5 years	• Have complement component deficiencies • Have functional or anatomic asplenia (including sickle cell disease) • Are in the risk group for an outbreak for which vaccination is recommended

* If the most recent dose was received before age 7 years, a booster dose should be administered 3 years later.

† For infants aged 9–23 months, 2 doses of MenACWY-D should be administered 12 weeks apart. For infants receiving the vaccine before travel, the second dose may be administered as soon as 8 weeks after the first dose (additional information at http://www.cdc.gov/mmwr/preview/mmwrhtml/rr6202a1.htm).

§ Because of high risk for invasive pneumococcal disease, children with functional or anatomic asplenia should not be immunized with MenACWY-D before age 2 years to prevent immune interference with 13-valent pneumococcal conjugate vaccine (PCV13).

¶ Hib-MenCY-TT should not be used for booster doses. A quadrivalent meningococcal vaccine (MenACWY-CRM or MenACWY-D) should be used for booster doses.

Serogroup B Vaccination

Over the last half decade there have been multiple college campus outbreaks of meningococcus serogroup B, for which the above-mentioned vaccinations are not effective. On October 29, 2014, the Food and Drug Administration (FDA) licensed the first serogroup B meningococcal vaccine (MenB-FHbp, Trumenba®). FDA approved this vaccine for use in people 10–25 years of age

as a 3-dose series. On January 23, 2015, FDA licensed a second serogroup B meningococcal vaccine (MenB-4C, Bexsero®). FDA approved this vaccine for use in people 10–25 years of age as a 2-dose series.

MenB vaccination is now recommended for those ≥10 years with complement deficiencies, anatomic or functional asplenia, microbiologists who have contact with *N. meningitidis*, and others at increased risk during a serogroup B outbreak (Table 3).[6] Of note, persons taking eculizumab are also now included in the category of "complement component deficiencies." In organizational meningococcus serogroup B outbreaks vaccination should be considered in consultation with CDC.[7] CDC divides recommendations into organizations with populations <5,000 (Table 4) and ≥5,000 (Table 5). MenB vaccination is not currently routinely recommended for incoming college students in the absence of an outbreak at that institution. Concomitant administration MenB-FHbp with other adolescent vaccinations (4vHPV, MenACWY, Tdap, and DTaP/IPV) is acceptable and does not cause significant immunogenic interference with those vaccines.

Table 3. Meningococcal vaccination recommendations for persons at increased risk of meningococcal disease, non-group B meningococcus, ACIP (2013)*

Age group	Subgroup
2–55 yrs with high-risk conditions and not previously vaccinated	Persons who: • Have persistent complement deficiencies • Have functional or anatomic asplenia[¶] • Have HIV, if another indication for vaccination exists Persons who: • Are first-year college students aged ≤21 years living in residential housing • Travel to or are residents of countries where meningococcal disease is hyperendemic or epidemic[§,**] • Are at risk during a community outbreak attributable to a vaccine serogroup • Are microbiologists routinely exposed to isolates of *Neisseria meningitidis*

* Includes persons who have persistent complement deficiencies (e.g., C5–C9, properdin, factor H, or factor D), and anatomic or functional asplenia; travelers to or residents of countries in which meningococcal disease is hyperendemic or epidemic; and persons who are part of a community outbreak of a vaccine-preventable serogroup.

† If the person remains at increased risk for meningococcal disease.

§ Infants and children who received Hib-MenCY-TT and are travelling to areas with high endemic rates of meningococcal disease such as the African "meningitis belt" are not protected against serogroups A and W-135 and should receive a quadrivalent meningococcal vaccination licensed for children aged ≥9 months prior to travel.

¶ Because of high risk for invasive pneumococcal disease, children with functional or anatomic asplenia should not be immunized with MenACWY-D (Menactra®) before age 2 years to avoid interference with the immune response to the pneumococcal conjugate vaccine (PCV) series.

** If an infant is receiving the vaccine prior to travel, 2 doses may be administered as early as 8 weeks apart.

†† If MenACWY-D is used, it should be administered at least 4 weeks after completion of all PCV doses.

Table 4. Meningococcus serogroup B vaccination recommendations, ACIP (2015)

Age	Vaccine and schedule*	Risk groups
≥10 years	MenB-FHbp (Tumenba®) [§] Three dose series at 0, 2, and 6 months Or MenB-4C (Bexsero®) [†] Two dose series with doses given at least 1 month apart	• Persons with persistent complement component deficiencies.[¶] • Persons with anatomic or functional asplenia.** • Microbiologists routinely exposed to isolates of *Neisseria meningitidis*. • Persons identified as at increased risk because of a serogroup B meningococcal disease outbreak.
16-23 years (Preferred age: 16-18 years)	MenB-FHbp (Tumenba®) [§] Three dose series at 0, 2, and 6 months Or MenB-4C (Bexsero®) [†] Two dose series with doses given at least 1 month apart	• A serogroup B meningococcal (MenB) series may be administered to young adults 16 through 23 years of age to provide short term protection against most strains of serogroup meningococcal disease. The preferred age for MenB vaccination is 16 through 18 years of age.***

[*] Based on available data and expert opinion, either MenB vaccine may be administered concomitantly with other vaccines indicated for this age, but at a different anatomic site, if feasible. The same vaccine product should be used for all doses.
[§] Wyeth Pharmaceuticals, Inc.
[†] Novartis Vaccines
[¶] Including inherited or chronic deficiencies in C3, C5-9, properdin, factor D, factor H, or who are taking eculizumab (Soliris).
** Including sickle cell disease.
*** Category B recommendation from ACIP.

Table 5. Meningococcus serogroup B outbreak recommendations in organizations with population size <5,000 persons[7]

1 case	• Serogrouping of isolate or clinical specimen performed • If case has serogroup B disease, the state health department should contact CDC (Meningitis and Vaccine Preventable Diseases Branch at 404.639.3158) • Isolate typed or stored for future molecular typing, or sent to CDC, but not discarded • Case investigation • Chemoprophylaxis of close contacts
2 or more cases in 6 months	Same response as after 1 case with the following additions: • If all cases have serogroup B disease, the state health department should contact CDC (Meningitis and Vaccine Preventable Diseases Branch at 404.639.3158) • Send isolates to CDC for molecular typing and testing to predict strain coverage of vaccine • If all cases have serogroup B disease and available information supports use of MenB vaccine, consult CDC regarding the use of MenB vaccine using a CDC-sponsored expanded access investigational new drug (IND)

Table 6. Meningococcus serogroup B outbreak recommendations in organizations with population size ≥5,000 persons[7]

1 case	• Serogrouping of isolate or clinical specimen performed • Isolate typed or stored for future molecular typing, or sent to CDC, but not discarded • Case investigation • Chemoprophylaxis of close contacts
2 cases in 6 months	Same response as after 1 case with the following additions: • If both cases have serogroup B disease, the state health department should contact CDC (Meningitis and Vaccine Preventable Diseases Branch at 404.639.3158) • Send isolates to CDC for molecular typing for both cases
3 or more cases in 6 months	Same response as after 1 case with the following additions: • If all cases have serogroup B disease, the state health department should contact CDC (Meningitis and Vaccine Preventable Diseases Branch at 404.639.3158) • Send isolates from additional cases to CDC for molecular typing and testing to predict strain coverage of vaccine • If all cases have serogroup B disease and available information supports use of MenB vaccine, consult CDC regarding the use of MenB vaccine using a CDC-sponsored expanded access IND

3. Antibiotic Prophylaxis

Chemoprophylaxis should be recommended for all household members of confirmed or presumptive cases and other exposed persons, as defined in §4.1. Chemoprophylaxis should be initiated as soon as possible, ideally <24 hours after index patient identification.[8] If >14 days have passed since the last contact with the index patient, chemoprophylaxis is likely to be of little benefit. Chemoprophylaxis should also be recommended to daycare contacts under certain circumstances (see §6). It should not be recommended to persons who have had only brief or casual contact with the case. If such persons are anxious about their exposure, they should be advised that their risk of disease is extremely low. They should be further advised to be alert to signs and symptoms of illness, especially fever, and to seek medical care immediately should illness develop.

Prophylaxis of close contacts of culture positive patients with pneumonia or primary meningococcal conjunctivitis without accompanying bacteremia is not recommended in the U.S. due to a lack of evidence of transmission.

Acceptable chemoprophylaxis includes ciprofloxacin, rifampin, or ceftriaxone, each of which are 90–95% effective in reducing nasopharyngeal carriage of *N. meningitidis*. Azithromycin is less well-studied, and *not* routinely recommended, but has also been shown to eradicate nasopharyngeal carriage. It may be considered as *second-line* chemoprophylaxis and may be useful in the uncommon instance of ciprofloxacin resistance.

Ciprofloxacin was not previously recommended in children due to induced arthropathy in juvenile animals, but abundant evidence of lack of joint damage has been found in young children given ciprofloxacin. In one randomized clinical trial on carriage eradication, ciprofloxacin when compared to rifampicin did not lead to a higher rate of side effects. Multiple controlled prospective and retrospective studies, using higher doses of ciprofloxacin, showed that the rate of adverse events of ciprofloxacin in children was similar to that seen with other antibiotics, and that long-term cartilage damage was not seen in humans.[9,10] The dosage for persons ≥1 month of age is 20 mg/kg up to a maximum of 500 mg, orally.[11] Ciprofloxacin is not recommended for pregnant women.

Rifampin dosage for those <1 month of age is 5 mg/kg twice daily for two days; for persons ≥1 month of age, 10 mg/kg twice daily for two days (maximum 600mg). Rifampin chemoprophylaxis is not recommended for pregnant women. Those taking rifampin should be informed that gastrointestinal upset, orange discoloration of urine, discoloration of soft contact lenses, and decreased effectiveness of oral contraceptives can occur. Complete medication list should be obtained and checked for interactions prior to providing rifampin (N.b.: that the rifampin schedule for eradication of *Haemophilus influenzae* carriage is effective against *N. meningitidis* carriage as well, but not vice versa.)

Ceftriaxone can be used for children and adults (including pregnant women) to eradicate nasopharyngeal carriage if ciprofloxacin and rifampin are contraindicated. It is given as a single IM dose of 125 mg for children <15 years of age and 250 mg for older persons.

Azithromycin may be given as a single oral dose of 10 mg/kg (maximum of 500 mg).

The drug of choice for children is rifampin or ciprofloxacin.[11] Keep in mind that liquid suspension for ciprofloxacin may not be readily available.

Table 7. Recommended chemoprophylaxis regimens for protection against meningococcal disease

Drug	Age	Dose	Duration	Cautions
Ciprofloxacin	≥1 mo	20 mg/kg up to a max of 500 mg	Single dose	Not recommended for pregnant women
Rifampin	<1 mo ≥1 mo	5 mg/kg, orally, twice daily 10 mg/kg (maximum 600 mg), orally, twice daily	2 days	Can interfere with the efficacy or oral contraceptives, some anticonvulsants, and warfarin among many other drug interactions; may stain soft contact lenses orange Not recommended in pregnant women
Ceftriaxone	<15 y ≥15 y	125 mg, intramuscularly 250 mg, intramuscularly	Single dose	To decrease pain at injection site, dilute with 1% lidocaine
Azithromycin		10 mg/kg (maximum 500 mg), orally	Single dose	Not routinely recommended Use when fluoroquinolone-resistant *N. meningitidis* has been identified in the community

6. MANAGING SPECIAL SITUATIONS 4

6.1 Case Attends a Daycare Facility

If the child has attended any such facility for at least 4 hours (cumulatively) during the week before onset, then within 24 hours of the initial report:

1. The operator of the day-care facility should be interviewed to determine whether other cases of meningococcal disease occurred among attending children during the past 60 days.
2. The parents of children who are in the same classroom as the case should be notified (preferably in writing) of the occurrence of meningococcal disease in the facility. The notice should advise parents to:
   - seek chemoprophylaxis for their attending children without delay.
   - watch their children carefully for a two-week period for signs of illness, especially fever, and seek medical care immediately if illness should occur. Advise parents that an elevated risk may persist for up to two months following the occurrence of a case.
3. Instruct the day-care operator to notify the LHD immediately if another person becomes ill with signs and symptoms of meningococcal disease over the next two months.
4. Chemoprophylaxis should also be given to all staff in the ill child's classroom.
5. Children and staff in other rooms are usually not at elevated risk, and do not need chemoprophylaxis

6.2 Multiple Cases in a Defined Population within a 3-month Period

If three or more confirmed or probable cases of meningococcal disease of the same serogroup among persons who have a common affiliation but not close contact occur within a 3-month period, a primary attack rate should be calculated. Contact Oregon Public Health Division immediately for consultation.

6.3 Troubleshooting Prophylaxis Availability

What if the contact's insurance refuses to cover the cost of prophylaxis? Prophylaxis should be covered by all insurance policies in Oregon (e.g., Oregon Health Plan, etc.), though a copayment may be required. If the pharmacist cannot obtain authorization, the insurance company should be contacted directly for pre-approval.

Also, as prophylaxis requires only 1 to 4 doses and generics for the recommended antibiotics are available, inquire with the pharmacist what the out-of-pocket cost would be: the total cost of the medication might be less than a copayment.

What if contacts are still unable to obtain rifampin due to financial circumstances? If contacts meeting prophylaxis guidelines have been advised by the LHD to take rifampin, and they are unable to obtain rifampin by any other means due to financial circumstances, then the LHD may dispense rifampin out of its TB stock after consulting with the TB Program or Public Health Division epidemiologist on call.

The LHD must then send a memo to the state TB program describing the circumstances, accounting for the rifampin dispensed and requesting replacement of stock.

What if there is not a compounding pharmacy available to prepare rifampin suspension for pediatric contacts requiring prophylaxis? Rifampin is formulated as 150mg or 300mg capsules, which can be opened and sprinkled on applesauce or jello, or mixed with simple syrup (e.g., Syrup NF, Wild Cherry Syrup, etc.), following the manufacturer's instructions.

If neither of these rifampin formulations is readily available or the child cannot be dosed appropriately using capsules, ceftriaxone injection is recommended to eradicate nasopharyngeal carriage of *N. meningitidis*. Ceftriaxone for injection may be acquired through emergency rooms, urgent care clinics, and some private clinics and pharmacies in either 125mg or 250mg doses.

Finally, if none of the above options is available, one dose of oral ciprofloxacin is an alternative for contacts aged 1 month and older. Oral azithromycin is considered the least preferable option, and is not routinely recommended.

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UPDATE LOG

November 2016. Clarified drugs of choice for children (Tasha Poissant).

December 2015. Updated Ciprofloxacin dosing recommendations to be consistent with the 2015 Red Book recommendations. (Tasha Poissant)

July 2015. DRAFT Reformatted into new IG template. (Kathleen Vidoloff)

June 2015. Updated epidemiologic data, risk groups, treatment, vaccination recommendations, chemoprophylaxis recommendations, and serogroup B vaccination information. (David Serota, Tasha Poissant)

February 2015. Updated case definitions to be in line with CSTE case definitions. Added latex agglutination as acceptable test results in CSF for a confirmed case. (Tasha Poissant)

July 2012. Added information about how to troubleshoot prophylaxis availability to Managing Special Situations Section. Clarified prophylaxis recommendations. (Jamie Thompson)

December 2011. Updated vaccination recommendations and clarified time frame for chemoprophylaxis administration. (Jamie Thompson)

May 2007. This is the corrected version of what was meant to be the July release. The confirmed case definition was modified to incorporate PCR results. Recommendations for the new conjugate vaccine MCV4 were incorporated into the active immunization section. Primary meningococcal conjunctivitis and pneumonia were added as uncommon but possible presentations of meningococcal disease. (June Bancroft)