
**STANDARD
NURSE PROTOCOLS
FOR
OTHER INFECTIOUS
DISEASES**

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2011-2012 OTHER INFECTIOUS DISEASE CLINICAL REVIEW TEAM

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**STANDARD NURSE PROTOCOL FOR
AMEBIASIS, UNCOMPLICATED
(Amebic Colitis)**

DEFINITION Infection of the intestinal tract by certain species of **the genus *Entamoeba***. Extraintestinal disease occasionally occurs, with the liver as the most common site.

More severe disease is associated with immunosuppression, malnutrition, young **and old** age, **pregnancy** and residence in tropical countries. Complications may include toxic megacolon, colon or perianal ulceration, and perforation. Progression may occur if other causes of colitis are suspected and infected persons are inappropriately treated with corticosteroids and/or antimotility drugs.

ETIOLOGY *Entamoeba histolytica* causes invasive disease. *Entamoeba dispar* and *Entamoeba moshkovskii* are noninvasive parasites and do not cause disease **and do not require treatment**. The organisms are excreted as cysts or trophozoites in the feces of infected persons.

Transmission occurs when cysts are ingested. Transmission has occasionally been associated with contaminated food or water, and may occur sexually by oral-anal contact. The incubation period is variable but is usually 1-4 weeks. If untreated, an infected person can excrete cysts intermittently and transmit infection for years. Most cyst passers are asymptomatic.

SUBJECTIVE

1. May be asymptomatic.
2. If history of mild, chronic symptoms (abdominal discomfort with loose stools containing blood or mucus alternating with periods of constipation or no symptoms), refer client to a physician.
3. If history of acute symptoms that have progressively increased over 1-3 weeks (grossly bloody or mucoid stools accompanied by lower abdominal pain, tenesmus, fever, chills and weight loss), refer client to a physician.

OBJECTIVE

1. Client does not appear acutely ill; no extensive weight loss or fever.
2. Microscopic identification of trophozoites or cysts in feces. Examination of serial samples may be necessary.

NOTE: Trophozoites containing red blood cells are more likely to be *Entamoeba histolytica* than *E. dispar* or *E. moshkovskii*.

ASSESSMENT Amebiasis, asymptomatic.

PLAN **DIAGNOSTIC STUDIES**

If history or physical exam shows evidence of a liver disorder, obtain liver function tests before ordering treatment.

THERAPEUTIC

PHARMACOLOGIC

For asymptomatic (cyst-passing) clients who are not pregnant or breastfeeding and

- for paromomycin therapy, have no history of renal and/or liver disease or hypersensitivity to paromomycin or components
- for iodoquinol therapy, have no history of thyroid disease, no evidence of liver damage, renal disease or pre-existing optic neuropathy, and no hypersensitivity to iodine or 8-hydroxy-quinolones (which are present in cosmetic products).

1. Adults

a. Paromomycin sulfate 25-35 mg/kg daily, administered in 3 divided doses with meals, for **5 – 10** days.

OR

b. Iodoquinol 650 mg, 1 tablet PO three times a day after meals for 20 days, **not to exceed 2gm/day**.

OR

Iodoquinol 210 mg, 3 tablets PO three times a day after meals for 20 days.

NOTE: Additional courses of iodoquinol therapy should not be repeated before an interval of 2 –3 weeks.

2. Children

a. Preferred regimen: Paromomycin sulfate 25-35 mg/kg daily, administered in 3 divided doses with meals, for **5 – 10** days.

OR

b. Iodoquinol **30 - 40** mg/kg/day PO in 3 divided doses, **maximum of 650mg/dose** (not to exceed 1.95 gm in 24 hours) for 20 days.

NOTE: Long-term or repeated use of Paromomycin may cause a **secondary** infection.

CLIENT EDUCATION/COUNSELING

1. Follow the medication schedule for the entire treatment cycle. Immediately report if a rash occurs.
2. If taking paromomycin, promptly report any ringing in the ears, hearing loss or dizziness.
3. Safety for use during pregnancy or lactation has not been established for Iodoquinol. Paromomycin is not found in breast milk, **but has not been studied in pregnancy.**
4. Careful hand-washing following defecation, sanitary disposal of feces, and avoidance of nail biting.
5. Treatment of drinking water if traveling in areas without chlorination.
6. Avoidance of oral-anal sexual practices, or use of barrier protection during oral-anal sexual practices.
7. Exclusion of known cyst passers from preparing, processing, and serving food until treatment is completed and follow-up examinations are normal x3 occasions.
8. Thyroid function tests might be unreliable for up to six months after finishing iodoquinol.

FOLLOW-UP

1. Repeat stool exam x3, collected on separate days starting three to four weeks following completion of treatment.
2. Household members and other contacts should have stool studies x3, within a few days up to four weeks. If family members and/or other contacts present with symptoms of the disease, stool studies should be done immediately.

REFERRAL/CONSULTATION

1. Clients with mild, chronic symptoms, symptoms of acute colitis or extra-intestinal symptoms.
2. Clients with contraindications to listed treatments.

3. Any client who develops worsening abdominal symptoms on treatment, or who experiences any liver, eye, thyroid, or peripheral neuropathy symptoms while on iodoquinol.
4. Any client whose follow-up stool exams show persistent infection.

REFERENCES

1. Larry Pickering (ed.), *Red Book 2009, Report of the Committee on Infectious Diseases*, 28th ed., American Academy of Pediatrics, Elk Grove Village, IL, 2009, pp. 206-208 (Current)
2. David L. Heymann, *Control of Communicable Diseases Manual*, 19th ed., American Public Health Association, Washington, DC, 2008. (Current)
3. "Lexi-Drugs Online," *Lexi-Comp Database™*, Lexi-Comp, Inc., Hudson, Ohio (**April 29, 2011**).
4. Patrick Ayeh-Kumi, M. Phil, William Petri, Jr., "Diagnosis and Management of Amebiasis," *Medscape*, October 11, 2002. (Current).

STANDARD NURSE PROTOCOL FOR PREVENTIVE TREATMENT OF *HAEMOPHILUS INFLUENZAE* TYPE b (Hib) DISEASE CONTACTS

NOTE: Public health nurses must work closely with the local communicable or infectious disease coordinator (or other official) who is monitoring and investigating reported *Haemophilus influenzae* and *Haemophilus influenzae* type b cases and contacts, to ensure that complete vaccination and medical history is obtained for the index case, that household and childcare contacts have been identified, and eligible contacts have been treated when appropriate. In addition, this protocol emphasizes the need for prompt serotyping of *H. influenzae* isolates. **Public health personnel** should ensure the isolate is serotyped and forwarded to the Georgia Public Health Laboratory **for confirmation**.

DEFINITION *Haemophilus influenzae* type b (Hib) is a particularly virulent strain of the bacterium *H. influenzae*. *H. influenzae* **can cause invasive infections including** meningitis (an inflammation of the membranes and fluid that surround the brain and spinal cord), **bacteremia**, pneumonia, cellulitis, epiglottitis, septic arthritis and other invasive infections.

Although there are many strains of *H. influenzae*, including typable and nontypable strains, and any strain may cause invasive disease, guidelines for preventive treatment are written only for infections caused by Hib. When an index case of Hib disease is identified, **post-exposure prophylaxis** should be offered to close contacts (defined below) as soon as possible (preferably within 24 hours). Studies have shown that **prophylaxis** with rifampin eradicates greater than 95% of Hib carriage in contacts of primary Hib cases.

Empirical vs. Delayed Prophylaxis of *H. influenzae* cases not known to be Hib: Widespread use of the Hib vaccine has made Hib a rare cause of disease, and offering prophylaxis to all **clients** with invasive *H. influenzae* could result in significant overtreatment. However, a delay in prophylaxis **while** waiting for serotype information to **determine if *H. influenzae* isolates are serotype B may result in unnecessary spread of disease**. A proposed approach to optimize early decision-making regarding prophylaxis is based on epidemiologic findings below*, and includes:

1. Promptly obtaining immunization records and medical history for **any child with invasive *H. influenzae* disease**.
2. Empirical, early prophylaxis of contacts (without waiting for serotype information) if **the** child with invasive *H. influenzae* disease is unimmunized **OR** incompletely immunized against Hib (defined below in 1a.), **OR** is immunologically compromised.
3. Delaying prophylaxis of contacts until after the isolate is serotyped as Hib is appropriate where the index case is a fully immunized, immunologically normal child or an adult.
4. Consultation is available at 404-657-2588 (Acute Disease

Epidemiology Section, **GA Department of Public Health**), if needed.

Serotyping of *H. influenzae* isolates is available at the Georgia Public Health Laboratory and some hospital and reference laboratories. All invasive *H. influenzae* isolates should be promptly sent to the GPL for confirmatory serotyping.

SENDSS Data epidemiologic findings:* Between 2000 and 2010 in Georgia, Hib caused only 10 (4%) of **224 invasive *H. influenzae* disease cases in children and 13 (2%) of **642** cases in adults (*data limited to **866/1371** cases with known age and serotype). Among 10 children with Hib disease, at least 6 were unimmunized, 2 had completed only a partial primary series, **and 2 had severe immunologic compromise**. From this it is inferred that fully vaccinated, immunologically normal children are unlikely to have Hib disease.

Indications and guidelines for preventive treatment (chemoprophylaxis) of Hib disease contacts are:

1. Chemoprophylaxis recommended for:
 - a. All household contacts (except pregnant women), irrespective of age, with at least 1 contact younger than 4 years of age who is unimmunized or incompletely immunized.

NOTE: Household contacts are persons residing with the index case, or who spent 4 or more hours with the index case for at least 5 of the 7 days preceding the day of hospital admission.

NOTE: Complete immunization means having had at least 1 dose of conjugate vaccine at 15 months of age or older; 2 doses between 12 and 14 months of age; or a 2- or 3-dose primary series when younger than 12 months with a booster dose at 12 months of age or older. See the Georgia Immunization Program Manual, Recommended Schedules and Guidelines, for vaccine information and vaccine administration guidelines at <http://www.health.state.ga.us/programs/immunization/publications.asp>.
 - b. All members of a household with a child younger than 12 months of age **who has not received the primary series**.
 - c. All occupants of a household with an immunocompromised child, irrespective of the child's Hib immunization status.
 - d. Nursery and child care center contacts, irrespective of age

- or immunization status, when 2 or more cases of invasive disease have occurred within 60 days.
- e. Index case, if treated with regimens other than cefotaxime or ceftriaxone. Chemoprophylaxis usually is provided just before hospital discharge.

2. Chemoprophylaxis not recommended for:
 - a. Occupants of households with no children younger than 4 years of age other than the index **client**.
 - b. Occupants of households when all household contacts younger than 48 months of age have completed their Hib immunization series. See the previous page for definition of complete immunization.
 - c. Nursery and child care center contacts of one index case, especially those older than 2 years of age.
 - d. Pregnant women.

ETIOLOGY The bacteria *Haemophilus influenzae*, type b (Hib).

- SUBJECTIVE**
1. History of household or day-care contact as defined above under "Chemoprophylaxis recommended."
 2. No history of Hib immunization/vaccination.
 3. Absence of prodromal meningitis symptoms, i.e., respiratory illness or sore throat. Absence of meningitis disease symptoms, i.e., fever, headache, stiff neck or vomiting.
 4. No history of hypersensitivity to any of the rifamycins or of liver function impairment.

- OBJECTIVE**
1. Negative pregnancy test.
 2. No signs of respiratory illness or meningitis.

ASSESSMENT Candidate for preventive treatment for *H. influenzae* type b disease exposure.

PLAN **DIAGNOSTIC STUDIES**

1. Pregnancy test, if question of pregnancy.
2. Liver function test, if 15 years of age or older and question of liver function impairment.

NOTE: Clients with impaired liver function should be given

rifampin only in case of absolute necessity, with caution and under strict medical supervision.

THERAPEUTIC

PHARMACOLOGIC

1. Rifampin prophylaxis
(Pediatric Drug Chart – see Appendix A, p. 11.31)
Begin preventive treatment as **soon** as possible. If more than 14 days have passed since the last contact with the index case, the benefit of preventive treatment is likely to be decreased.
 - a. Nonpregnant adults:
Rifampin 600 mg PO once a day for 4 days.
 - b. Infants less than 1 month old:
Rifampin 10mg/kg/day PO once a day for 4 days.
 - c. Infants over 1 month old and children:
Rifampin 20 mg/kg (maximum 600 mg) PO once a day for 4 days.

NOTE: Rifampin as a dry powder may be mixed with applesauce. Rifampin oral suspension, compounded 10 mg/mL with simple or wild cherry syrup, is stable for 4 weeks at room temperature, or in refrigerator, when stored in an amber glass prescription bottle.

2. Evaluate status of all vaccinations and bring up-to-date by administration of the currently recommended doses for each disease. Children who have had Hib disease still need vaccination against Hib. See the Georgia Immunization Program Manual at <http://www.health.state.ga.us/programs/immunization/publications.asp>.

CLIENT EDUCATION/COUNSELING

1. Avoid drinking alcohol while taking rifampin.
2. Avoid breastfeeding because rifampin does enter breast milk.
3. Rifampin may cause the urine, feces, saliva, sputum, sweat and tears to temporarily turn red-orange.

4. Do not use soft contact lenses when on rifampin; permanent discoloration may occur.
5. Since rifampin has been reported to cross the placental barrier and appear in cord blood and in maternal milk, neonates and newborns of rifampin-treated mothers should be carefully observed for any evidence of side effects.
6. The reliability of oral contraceptives and Norplant may be affected. Consideration should be given to using alternative contraceptive measures during, and immediately following, rifampin therapy, until the next cycle.
7. Most people can take rifampin without difficulty. However, any of the following signs or symptoms should be reported, as soon as possible: fever, nausea, vomiting, loss of appetite, dark coffee or tea-colored urine, white/gray/light tan bowel movement, tiredness, weakness, yellow skin or sclera, bruising easily, rash/itching, and/or painful menstruation.
8. Rifampin interacts with many drugs. Check the rifampin product package insert for a complete list of drug interactions.
9. It is important to have all children receive Hib vaccine, starting at 2 months of age.

REFERRAL

1. Clients with adverse reactions to treatment or signs/symptoms of meningitis.
2. If there is an absolute contraindication to use of rifampin, consult physician regarding use of sulfisoxazole or ceftriaxone, as an alternative.

REFERENCES

1. Larry Pickering (ed.), *Red Book 2009, Report of the Committee Infectious Diseases*, 28th ed., American Academy of Pediatrics, Elk Grove Village, IL, 2009, pp. 314-321. (Current)
2. CDC, *Epidemiology & Prevention of Vaccine-Preventable Diseases*, 10th ed., Atlanta, GA, 2009, pp. 71-83. (Current)
3. David L. Heymann, *Control of Communicable Diseases Manual*, 19th ed., American Public Health Association, Washington, DC, 2008. (Current)
4. Georgia Immunization Program, Division of Public Health, "Surveillance and Reporting: *Haemophilus influenzae* Invasive Disease Fact Sheet," *Immunization Program Manual*, 2010.
5. Georgia Department of **Community Health**, Division of Public Health, SENDSS Data <<https://sends.state.ga.us/sends/login.screen> (March 29, 2011).

STANDARD NURSE PROTOCOL FOR PREVENTIVE TREATMENT OF INVASIVE MENINGOCOCCAL DISEASE CONTACTS, INCLUDING MENINGITIS

NOTE: Public health nurses must work closely with the local communicable or infectious disease coordinator (or other official) who is monitoring reported meningococcal disease cases and contacts, to ensure that all eligible contacts have been identified and treated.

DEFINITION Invasive meningococcal disease includes meningitis (an inflammation of the meninges i.e., the membranes that surround the brain and spinal cord), bloodstream infections or sepsis (often associated with a petechial or purpuric rash or pneumonia). Rarely, other sterile sites (such as joint fluid) may be infected. When an index case of invasive meningococcal disease is identified, preventive treatment should be offered to high-risk household, day-care, and **preschool** contacts as soon as possible (preferably within 24 hours).

Indications and guidelines for preventive treatment (chemo-prophylaxis) of contacts are:

1. High risk - chemoprophylaxis recommended (close contact)
 - a. Household contact: especially children **less than 2 years**.
 - b. Childcare or **preschool** contact during the previous 7 days.
 - c. Direct exposure to the index case's secretions through kissing or sharing toothbrushes or eating utensils, markers of close social contact **at any time during the previous 7 days before onset of illness**.
 - d. Mouth-to-mouth resuscitation, unprotected contact during endotracheal intubation during 7 days before onset of the illness.
 - e. Frequently sleeps or eats in the same dwelling as the index case.
 - f. **Passengers seated directly next to index case during flight lasting more than 8 hours.**
2. Low risk - chemoprophylaxis not recommended
 - a. Casual contact: no history of direct exposure to index case's oral secretions, e.g., schoolmate or workmate.
 - b. Indirect contact: only contact is with a high-risk contact, no direct contact with the index case.
 - c. Health care personnel without direct exposure to the case's oral secretions.

3. In outbreak or cluster
Chemoprophylaxis for persons other than those at high risk should be given only after consultation with local public health authorities.

ETIOLOGY

Meningococcal disease is caused by *Neisseria meningitidis*, a Gram negative diplococcus (bacteria) with 13 serogroups. Strains belonging to groups A, B, C, Y, and W-135 are implicated most frequently in systemic disease. Asymptomatic colonization of the upper respiratory tract provides the focus from which the organism is spread.

SUBJECTIVE

1. History of contact as defined above under "High risk: chemoprophylaxis recommended."
2. Absence of prodromal meningitis symptoms (respiratory illness or sore throat.) Absence of meningitis disease symptoms (fever, headache, stiff neck or vomiting).
3. No history of hypersensitivity to any of the rifamycins or of liver function impairment.

OBJECTIVE

1. Negative pregnancy test.
2. No signs of respiratory illness or meningitis.

ASSESSMENT

Candidate for preventive treatment for meningococcal meningitis.

PLAN

DIAGNOSTIC STUDIES

1. Pregnancy test, if question of pregnancy.
2. Liver function test, if 15 years of age or older and if question of liver function impairment.

THERAPEUTIC

PHARMACOLOGIC

1. Rifampin
(Pediatric Drug Chart – see Appendix A, p. 11.31)
 - a. Nonpregnant adults: Rifampin 600 mg PO every 12hr for 4 doses.
 - b. Infants over 1 month old **and children**: Rifampin **10 mg/kg** (maximum 600 mg/**dose**) PO every 12hr for 4 doses.

- c. Infants less than 1 month old: Rifampin **5 mg/kg** PO every 12hr for 4 doses.
OR
2. Ceftriaxone
NOTE: Give only if the client cannot take rifampin.
 - a. Adults and children age **15 and older:**
Ceftriaxone 250 mg IM, once.
 - b. Children **under age 15 years:**
Ceftriaxone 125 mg IM, once.
OR
3. Ciprofloxacin 500 mg PO once, may be given to persons 18 years of age or older to eliminate nasopharyngeal carriage of *N. meningitidis*. Do not give to pregnant or lactating women. Ciprofloxacin has been associated with an increased rate of adverse reactions involving the joints and surrounding tissue structures (like tendons) in children (younger than 18 years of age).
4. Immunoprophylaxis: Since secondary cases can occur several weeks or more after onset of disease, meningococcal vaccine is a possible adjunct to chemoprophylaxis during an outbreak caused by a serogroup covered by the vaccine. No vaccine is available for the prevention of group B disease. See the Georgia Immunization Program Manual, Recommended Schedule and Guidelines, for vaccine information and administration guidelines at <http://www.health.state.ga.us/programs/immunization/publications.asp>.

CLIENT EDUCATION/COUNSELING

1. Meningococcal meningitis is not highly contagious. Even close family members of a meningitis **client** have only a 1 in 250 chance of developing disease from the infected person.
2. The bacteria that causes meningococcal meningitis is spread through intimate, prolonged contact, such as "deep" kissing with exchange of saliva, or exposure to oral secretions with mouth-to-mouth resuscitation or by day-care contacts. The bacteria cannot live outside the human body, and animals do not carry the bacteria.
3. Consult rifampin product package insert for complete listing of interactions. If taking rifampin:
 - a. Avoid drinking alcohol.

- b. Rifampin interacts with many drugs. Check the rifampin product package insert for a complete list of drug interactions.
 - c. It is normal for urine, feces, saliva, sputum, sweat and tears to temporarily turn red-orange.
 - d. Avoid the use of soft contact lenses during treatment because permanent discoloration may occur.
 - e. The drug may interfere with the reliability of oral contraceptives. Use of an alternative method should be considered during, and immediately following, rifampin therapy.
 - f. If any of the following signs or symptoms occur, report them as soon as possible: fever, nausea, vomiting, loss of appetite, dark coffee or tea-colored urine, white/gray/light tan bowel movement, tiredness, weakness, yellow skin or sclera, bruising easily, rash/itching, painful menstruation.
4. **The effect of Ciprofloxacin can be decreased by calcium-rich foods such as dairy products, antacids, or calcium supplements. Ciprofloxacin should be taken 2 hours before or 6 hours after eating calcium-rich foods unless they are part of a larger meal that contains other non-calcium rich foods.**
5. Ceftriaxone can cause a false-positive reaction for urine glucose with Benedict's solution, Fehling's solution or with Clinitest tablets, but not with enzyme-based tests such as Clinistix and Tes-Tape.
6. Routine immunization of adolescents and persons at risk for meningococcal disease is recommended. Immunization of college students is recommended by the American College Health Association, and is an actual requirement for admission to some schools. See the Georgia Immunization Program Manual, "Recommended Schedule and Guidelines," for vaccine information and administration guidelines at <http://www.health.state.ga.us/programs/immunization/publications.asp>.

REFERRAL

Clients with adverse reactions to treatment or signs/symptoms of meningitis.

REFERENCES

1. Larry K. Pickering (ed.), *Red Book 2009, Report of the Committee Infectious Diseases*, 28th ed., American Academy of Pediatrics, Elk Grove Village, IL, 2009, pp. **455-463**. (Current)
2. David L. Heymann, *Control of Communicable Diseases Manual*, 19th ed., American Public Health Association, Washington, DC, 2008. (Current)
3. American Society of Health-Systems Pharmacists, *American Hospital Formulary Services*, 2011 pp. **150-168, 357-381, 232-249**.

STANDARD NURSE PROTOCOL FOR PREVENTIVE TREATMENT OF PERTUSSIS CONTACTS

NOTE: Public Health Nurses must work closely with the local communicable/infectious disease coordinator (or other official) who is monitoring reported pertussis cases and contacts to ensure that all contacts have been identified and treated.

DEFINITION

Pertussis is a bacterial infection of the upper respiratory tract that can progress to severe paroxysms of coughing, often with a characteristic respiratory whoop, followed by vomiting. Fever is absent or minimal.

Transmission of pertussis is by close contact with respiratory tract secretions of an infected person, who is most contagious before onset of the paroxysmal cough. Macrolide therapy for cases decreases infectivity and may limit spread.

Up to 90% of non-immune household contacts acquire the disease. Immunity wanes over time and adolescents and adults become an important reservoir of infectious organisms. They are often the source of infection for infants, who are at the greatest risk of complications with permanent sequelae.

ETIOLOGY

The bacillus *Bordetella pertussis*. A whooping cough syndrome may also be caused by other organisms, with *Bordetella parapertussis* causing an appreciable portion of clinical cases of pertussis, especially milder cases. In some cases both organisms may be present.

SUBJECTIVE

1. History of recent close contact (e.g., household, day care) to:
 - a. A case of pertussis that has been laboratory-confirmed by a positive culture or polymerase chain reaction assay for *Bordetella pertussis*
 - OR**
 - b. A **probable** case of pertussis **i.e. a cough illness lasting 2 weeks or more, with at least one of the following symptoms: paroxysms of coughing, inspiratory “whoop”, or post-tussive vomiting; AND absence of lab confirmation.**
2. May or may not have a history of adequate immunization against pertussis.
3. No upper respiratory symptoms.
4. No history of allergy or other contraindications to taking the prophylactic medications. (See Drug Interaction Chart on

page 11.26.)

OBJECTIVE No signs of upper respiratory illness.

NOTE: Refer clients with upper respiratory signs to the **Standard Nurse Protocol for Identification and Treatment of Probable Pertussis Cases.**

ASSESSMENT Candidate for pertussis prophylaxis.

PLAN

THERAPEUTIC

1. Chemoprophylaxis
 - a. Erythromycin (preferably the estolate form):

NOTE: Do not give in hepatic dysfunction or pre-existing liver disease.

 - 1) Child (not preferred agent for infants less than 1 month due to infantile hypertrophic pyloric stenosis): Erythromycin 40 mg/kg (maximum of 2 gm) PO daily; give in divided doses every six hours for 14 days.
 - 2) **Adolescents and Adults:** Erythromycin 500 mg PO every six hours for 14 days.

OR
 - b. Azithromycin
 - 1) Child 6 months of age or older: Azithromycin 10 mg/kg (maximum of 500 mg) PO in a single dose on day 1, then 5 mg/kg (maximum 250mg/day) PO **on days 2 through 5.**
 - 2) Children less than 6 months: Azithromycin 10 mg/kg **as a single dose** for 5 days.
 - 3) Adult: Azithromycin 500 mg PO in a single dose on day 1, then 250 mg PO **on days 2 through 5.**

OR
 - c. Trimethoprim/sulfamethoxazole (TMP/SMZ)

NOTE: Give only if client cannot take others listed. Do not give if pregnant, breastfeeding, has pre-existing liver disease or is allergic to sulfa drugs. **Contraindicated in children less than 2 months of age.**

 - 1) Child over 6 months of age: TMP/SMZ (8 mg/40 mg)/kg/day PO, in two divided doses every 12 hours for 14 days.
 - 2) **Adolescents and Adults:** TMP/SMZ **160 mg/800 mg** PO twice daily for 14 days.

2. Immunization
Initiate or continue the pertussis immunization schedule for contacts. See the Georgia Immunization Program Manual, Recommended Schedules and Guidelines, for vaccine information and vaccine administration guidelines at <http://www.health.state.ga.us/programs/immunization/publications.asp>.

CLIENT/CARETAKER EDUCATION/COUNSELING

1. All close contacts need to take the medication, regardless of age or immunization status, because pertussis immunity is not absolute and may not prevent infection.
2. The importance of compliance with the medication regimen and completing the full course of treatment.
(Assist the client/caretaker to develop a written plan for taking, or administering, the medication so coverage is as close to around-the-clock as possible.)
3. Notify the clinician if apparent side effects to the medication develop (e.g., if nausea, vomiting, diarrhea, severe abdominal pain, or symptoms of hepatitis occur during the course of erythromycin therapy).
4. Seek medical care if develop symptoms of respiratory illness within 21 days (maximum incubation period) of the last exposure to the infected person.
5. Assure that unimmunized or incompletely immunized children under age 7 complete the vaccine series. Review current recommendations for individuals over age 7 years. See the Georgia Immunization Program Manual, Recommended Schedules and Guidelines, for vaccine information and vaccine administration guidelines at <http://www.health.state.ga.us/programs/immunization/publications.asp>.
6. Avoid aluminum or magnesium containing antacids 2 hours before and up to 2 hours after taking the macrolide product.

CONSULTATION/REFERRAL

1. Refer all exposed infants less than 6 months of age to a physician.
2. Refer all contacts with respiratory signs/symptoms **to the**

Standard Nurse Protocol for Identification and Treatment of Probable Pertussis Cases.

3. Consult with a physician or refer clients unable to take any of the above medications or who have serious side effects.

REFERENCES

1. Larry Pickering (ed.), *Red Book 2009, Report of the Committee Infectious Diseases*, 28th ed., American Academy of Pediatrics, Elk Grove Village, IL, 2009, pp. **504-519**. (Current)
2. CDC, *Epidemiology & Prevention of Vaccine-Preventable Diseases*, 11th ed., Atlanta, GA, **May 2009**, pp. **199-219**. **(Current)**
3. David L. Heymann, *Control of Communicable Diseases Manual*, 19th ed., American Public Health Association, Washington, DC, 2008. **(Current)**
4. Sarah Long, "Pertussis," Kliegman: *Nelson Textbook of Pediatrics*, 18th ed., Chapter 194, W. B. Saunders Company, 2007, <www.mdconsult.com> (May 4, 2009).
5. Epidemiology Unit, Georgia Division of Public Health, *Notifiable Disease Manual*.
6. CDC, "Recommended Antimicrobial Agents for the Treatment and Postexposure Prophylaxis of Pertussis," *MMWR*, December 2005. (Current)
7. "Lexi-Drugs Online," *Lexi-Comp Database*, Lexi-Comp, Inc., Hudson, Ohio **(April 29, 2011)**.

STANDARD NURSE PROTOCOL FOR IDENTIFICATION AND TREATMENT OF PROBABLE PERTUSSIS CASES

NOTE: Public health nurses must work closely with the District Epidemiologists/ Communicable/Infectious Disease Coordinator (or other official) who is monitoring reported pertussis cases and contacts to ensure that all contacts have been identified and treated.

DEFINITION

Pertussis is a bacterial infection of the upper respiratory tract that can progress to severe paroxysms of coughing, often with a characteristic respiratory whoop, followed by vomiting. Fever is absent or minimal.

Transmission of pertussis is by close contact with respiratory tract secretions of an infected person, who is most contagious before onset of the paroxysmal cough. Macrolide therapy for cases decreases infectivity and may limit spread.

Up to 90% of non-immune household contacts acquire the disease. Immunity wanes over time and adolescents and adults become an important reservoir of infectious organisms. They are often the source of infection for infants, who are at the greatest risk of complications with permanent sequelae.

ETIOLOGY

The bacillus *Bordetella pertussis*. A whooping cough syndrome may also be caused by other organisms, with *Bordetella parapertussis* causing an appreciable portion of clinical cases of pertussis, especially milder cases. In some cases both organisms may be present.

SUBJECTIVE

1. Cough illness of 2 weeks or more with one of the following: paroxysms of coughing, inspiratory “whoop,” or post-tussive vomiting, without other apparent cause.
2. Upper respiratory symptoms of coryza (runny nose) sneezing, low-grade fever, and a mild, occasional cough that preceded the prolonged cough.
3. May or may not have a history of adequate immunization against pertussis.
4. No history of allergy or other contraindications to the medications recommended for treatment. (See Drug Interaction Chart on page 11.26)

OBJECTIVE

SIGNS

A cough illness with at least one of the following:

1. fits of coughing (paroxysms)
2. inspiratory whoop
3. post-tussive vomiting

LABORATORY FINDINGS

May or may not have positive culture results. Serology and polymerase chain reaction (PCR) are currently unvalidated diagnostic tests for the identification of pertussis. However, if the case meets the clinical definition, PCR can be used to confirm a diagnosis. Consult with the District Epidemiologist or State Epidemiology Branch, Notifiable Diseases Section (404-657-2588) for questions about case confirmation, lab testing, and results.

ASSESSMENT

Candidate for pertussis treatment.

PLAN

DIAGNOSTIC STUDIES

NOTE: All suspect pertussis cases must be laboratory confirmed. All specimens should be submitted to the Public Health Laboratory. Please see Collection and Transport of *Bordetella pertussis* Specimens instruction sheet for details on specimen collection and transport; also see Nasopharyngeal Swab Specimen Collection video at <http://health.state.ga.us/epi/>. Culture media and nasopharyngeal swabs are available from the District Epidemiology Office. Specimen collection is of limited usefulness if done more than 3 weeks after symptom onset. Consult with the District Epidemiologist or state Epidemiology Branch, Notifiable Diseases Section (404/657-2588) for further guidance.

1. Nasopharyngeal swab to collect specimen for culture of *B. pertussis*.
2. Nasopharyngeal swab to collect specimen for Direct Fluorescent Antibody test for *B. pertussis*.

THERAPEUTIC

NOTE: Due to the lengthy turnaround time for laboratory results and because studies have shown that treatment is most effective when administered in the early stages of disease, **clients** should begin treatment for pertussis immediately after presumptive diagnosis.

PHARMACOLOGIC

1. Treatment

a. Azithromycin

1) Child 6 months of age or older:

Azithromycin 10 mg/kg (maximum of 500 mg) PO in a single dose on day 1, then 5 mg/kg (maximum 250mg/day) PO **on days 2 through 5.**

2) Children less than 6 months:

Azithromycin 10 mg/kg **as a single dose for 5 days**

3) Adult:

Azithromycin 500 mg PO in a single dose on day 1, then 250 mg PO **on days 2 through 5.**

OR

b. Erythromycin (preferably the estolate form):

NOTE: Do not give in hepatic dysfunction or pre-existing liver disease.

1) Child (not preferred agent for infants less than 1 month due to infantile hypertrophic pyloric stenosis):

Erythromycin 40 - 50 mg/kg (maximum of 2 gm) PO daily; give in divided doses every six hours for 14 days.

2) **Adolescents and Adults:**

Erythromycin 500 mg PO every six hours for 14 days.

OR, if cannot take others listed,

c. Trimethoprim/sulfamethoxazole (TMP/SMZ)

NOTE: Give only if client cannot take others listed. Do not give if pregnant, breastfeeding, has pre-existing liver disease or is allergic to sulfa drugs. **Contraindicated in children younger than 2 months of age.**

1) Child over 2 months of age:

TMP/SMZ (8 mg/40 mg)/kg/day PO, in two divided doses every 12 hours for 14 days.

2) **Adolescents and Adults:**

TMP/SMZ 160 mg/800 mg PO twice daily for 14 days.

2. Immunoprophylaxis

Initiate or continue the pertussis immunization schedule for cases. See the Georgia Immunization Program Manual, Recommended Schedules and Guidelines, for vaccine information and vaccine administration guidelines at <http://www.health.state.ga.us/programs/immunization/publications.asp>.

CLIENT/CARETAKER EDUCATION/COUNSELING

1. Identify all close contacts (**household contacts and possibly others**) and advise them to seek medical care for prophylaxis regardless of age or immunization status, because pertussis immunity is not absolute and may not prevent infection.
2. Counsel **client** about the importance of compliance with the medication regimen and completing the full course of treatment before returning to school or work (minimum 5 days of treatment). (Assist the client/caretaker to develop a written plan for taking, or administering, the medication so coverage is as close to around-the-clock as possible.)
3. Notify the clinician if side effects of the medication develop (e.g., if nausea, vomiting, diarrhea, severe abdominal pain, or symptoms of hepatitis occur during the course of erythromycin therapy).
4. Assure that unimmunized or incompletely immunized children under age 7 complete the vaccine series. Review current recommendations for individuals over age 7 years. See the Georgia Immunization Program Manual, Recommended Schedules and Guidelines, for vaccine information and vaccine administration guidelines at <http://www.health.state.ga.us/programs/immunization/publications.asp>.
5. Avoid aluminum or magnesium containing antacids 2 hours before and up to 2 hours after taking the macrolide product.
6. Erythromycin enteric-coated tablets or an ester derivative (e.g., estolate, ethylsuccinate) may be taken with food to minimize gastrointestinal irritation.
7. If client is presumptively diagnosed and treated in third trimester of pregnancy, instruct client to inform primary care and/or obstetrical provider of presumptive diagnosis (possible risk of transmission to newborn infant). **Client should be counseled to have family members and others who will be in close contact with the newborn vaccinated with Tdap as a protective measure.**

CONSULTATION/REFERRAL

1. Refer all infants less than 6 months of age with respiratory signs/symptoms to a physician.
2. Consult with a physician or the state Epidemiology Branch, Notifiable Diseases Section (404-657-2588) for management of all pregnant women with respiratory signs/symptoms.
3. Consult with a physician or refer clients unable to take any of the above medications or who have serious side effects.
4. If client is presumptively diagnosed and treated in third trimester of pregnancy, inform primary care and/or obstetrical provider of presumptive diagnosis (possible risk of transmission to newborn infant). **All close contacts of newborns should be advised to update their pertussis immunization status with Tdap per CDC guidelines (www.cdc.gov/vaccines/recs/schedules).**

DRUG INTERACTIONS (Not all inclusive)

Drug for Pertussis Prophylaxis or Treatment:	Reacts with:	Effect:
Erythromycin or Azithromycin	Pimozide (Orap®)	Cardiotoxicity; sudden death
Erythromycin	Rifabutin or Rifampin	May increase levels of rifabutin or rifampin.
Erythromycin or Azithromycin	Alfentanil	Decreased alfentanil clearance
Erythromycin or TMP-SMZ Caution with Azithromycin	Warfarin (Coumadin®)	Increased effect of warfarin
Erythromycin Azithromycin with triazolam	Alprazolam Diazepam Midazolam Triazolam	Increase CNS depressant effect of benzodiazepines.
Erythromycin or Azithromycin	Bromocriptine	Increased bromocriptine levels
Erythromycin	Buspirone (BuSpar®)	Increased buspirone levels
Erythromycin Caution with Azithromycin	Carbamazepine (Carbatrol® or Tegretol®)	Increased levels of carbamazepine
Erythromycin or Azithromycin TMP-SMZ	Cyclosporine (Neoral® or Sandimmune®)	Increased cyclosporine levels (toxicity)
Erythromycin or Azithromycin	Digoxin	Increased digoxin levels in some clients
Erythromycin or Azithromycin	Diospyramide	Cardiac arrhythmias
Erythromycin or Azithromycin	Ergot alkaloids	Ergot toxicity
Erythromycin	Felodipine (Lexxel® or Plendil®) and other dihydropyridine calcium antagonists	Increased levels of felodipine (toxicity)
Erythromycin	Grepafloxacin or Sparfloxacin	Cardiac arrhythmias
Erythromycin or Azithromycin	HMG-CoA reductase inhibitors (lovastatin, simvastatin)	Rhabdomyolysis
Erythromycin	Methylprednisolone	May need to decrease prednisolone dose
Erythromycin or Azithromycin	Tacrolimus (Prograf®)	Nephrotoxicity
Erythromycin Caution with azithromycin	Theophylline	Increased levels of theophylline
Erythromycin	Vinblastine	Vinblastine toxicity
Erythromycin	Valproic acid (Depakene®)	Increased levels of valproic acid
Erythromycin or Azithromycin	Aluminum and magnesium antacids	Decreased peak serum levels but not total absorption of macrolides
Erythromycin or Azithromycin	Antiretroviral agents	Varies; check package insert
Azithromycin or TMP-SMZ Caution with Erythromycin	Phenytoin (Dilantin®)	Increased levels of phenytoin
TMP-SMZ	Dapsone	Increased levels of both drugs
TMP-SMZ	Rifampin	May increase rifampin levels
TMP-SMZ	Sulfonylureas	Increased hypoglycemic response
TMP-SMZ	Methotrexate	Increased levels of methotrexate

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2. CDC, *Epidemiology & Prevention of Vaccine-Preventable Diseases*, **Atkinson W., Wolfe S., Hamborsky J., McIntyre L., eds.** 11th ed., **Washington DC: Public Health Foundation, 2009, pp. 199-216** (Current)
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4. Epidemiology Unit, Georgia Division of Public Health, *Notifiable Disease Manual*.
5. CDC, *Sexually Transmitted Diseases Treatment Guidelines 2010*, Vol. 59, No. RR-12, **December 17, 2010**
6. "Lexi-Drugs Online," *Lexi-Comp Database*, Lexi-Comp, Inc., Hudson, Ohio (**April 29, 2011**).
7. **CDC, Updated Recommendations for Use of Tetanus Toxoid, Reduced Diphtheria Toxoid and Acellular Pertussis (Tdap) Vaccine from the Advisory Committee on Immunization Practices, 2010 MMWR 2011, 60 (01);13-15.**

STANDARD NURSE PROTOCOL FOR RHEUMATIC FEVER - PROPHYLACTIC ANTIBIOTIC THERAPY

DEFINITION	<p>Clients with history of acute rheumatic fever are at high risk for recurrence if they develop a streptococcal group A upper respiratory tract infection. Because both asymptomatic and symptomatic infections can trigger a recurrence, the most effective protection from recurrences is continuous antibiotic prophylaxis, perhaps for life.</p> <p>Acute Rheumatic Fever is an inflammatory, multisystem disease that occurs 1-5 weeks to 6 months after infection with group A hemolytic streptococci. It is characterized by focal inflammatory lesions of the connective tissue structures (especially of the heart, blood vessels, and joints) and by the presence of Aschoff bodies in the myocardium and skin. Typically, the onset is signaled by the sudden occurrence of fever and joint pain, possibly followed by manifestation of heart and pericardial disease, abdominal pain, skin changes (erythema marginatum, subcutaneous nodules), and chorea. Minor manifestations include clinical (fever, arthralgias, previous acute rheumatic fever) and laboratory (leukocytosis, elevated ESR, abnormal C-reactive protein) alterations.</p>
ETIOLOGY	Certain M Serotypes of Group A Beta hemolytic <i>Streptococcus pyogenes</i>
SUBJECTIVE	Documented history of acute rheumatic fever. No history of allergic reaction to any prophylactic medication being considered.
OBJECTIVE	Assess need for continuous prophylaxis in consultation with primary care provider: <ol style="list-style-type: none">1. Client has had Acute Rheumatic Fever without carditis and has been receiving treatment for 5 years or until age 21, whichever is longer.2. Client has had Acute Rheumatic Fever with carditis but without evidence of residual heart disease (no valvular disease) and has been receiving treatment for 10 years or until age 21, whichever is longer.3. Client has had Acute Rheumatic Fever with carditis and has residual heart disease (persistent valvular disease) and last episode was over 10 years ago and client is at least 40 years old – consider lifelong prophylaxis if valvular disease is severe or exposure to group A streptococcal infection is ongoing (i.e. around school-age children).
ASSESSMENT	Candidate for secondary prophylaxis of acute rheumatic fever and no contraindication to medication selected.

PLAN

THERAPEUTIC

PHARMACOLOGIC

1. Penicillin G benzathine (Bicillin L-A)
 - a. **Adults and children (60lbs [27 kg] or greater):**
1.2 million units IM every 3-4 weeks OR 600,000 units IM every 2 weeks
 - b. **Clients weighing less than 60 lbs [27 kg]:**
600,000 units/kg IM every 4 weeks, not to exceed 1.2 million units/dose

NOTE: IM injections are recommended until late adolescence or young adulthood AND free of rheumatic attacks for at least 5 years; if there is risk of noncompliance with injections, then a change to oral prophylaxis is recommended.

OR

2. Penicillin VK tablets 250 mg
 - a. Adults and children : 250 mg PO twice daily.
 - b. Children less than 5 years of age: 125 mg PO twice daily.

ALTERNATIVES:

3. Sulfadiazine **or sulfisoxazole** 500 mg tablets
 - a. Adults and children (60 pounds [27 kg] or greater):
1 gram PO once daily
 - b. Children less than 60 pounds (27 kg): 500 mg PO once daily

NOTE: If using sulfadiazine, screen for G6PD deficiency and, if positive, consult with MD.

OR

4. If allergic to penicillin and sulfadiazine, give erythromycin. Adults and children **5 years or older:** 250 - 500 mg PO **every 6 -12 hours.**
 - a. **Children less than 5 year of age: 30 – 50 mg/kg/day in 2 – 4 divided doses; maximum 2 gm/day.**

NON-PHARMACOLOGIC

1. Client is under medical supervision.
2. Monitoring of medication compliance is jointly managed by public health and primary care providers. Efforts will be made to ensure access to care and medications.

3. An annual consultative report is to be kept on record from primary care provider for specific therapy for each client.

CLIENT EDUCATION/COUNSELING

1. Review importance of preventing recurrences of **Acute Rheumatic Fever**.
2. Counsel client on medications, directions for taking them, potential side effects and what to do about them.

FOLLOW UP

Client should return for reassessment and medication pickup every 3 months or for injections as directed.

REFERRAL/CONSULTATION

Consult with primary care provider for any signs or symptoms of recurrence of **Acute Rheumatic Fever** or if noncompliant with treatment.

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2. A. Gibofsky and John Zabriskie, "Poststreptococcal Arthritis and Rheumatic Fever," Firestein: *Kelley's Textbook of Rheumatology*, 8th ed., Chapter 105, W. B. Saunders Company, 2008. (Current).
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APPENDIX A

Rifampin Pediatric Drug Chart

Chart 1

Rifampin 5 mg/kg (do not exceed 600 mg/dose)

Kg weight	Rifampin dose
1	5
2	10
3	15
4	20
5	25
6	30
7	35
8	40
9	45

Chart 2

Rifampin 10mg/kg (do not exceed 600 mg/dose)

Kg weight	Rifampin dose
1	10
2	20
3	30
4	40
5	50
6	60
7	70
8	80
9	90

Chart 3

Rifampin 20mg/kg (do not exceed 600mg/dose)

Kg weight	Rifampin dose
1	20
2	40
3	60
4	80
5	100
6	120
7	140
8	160
9	180
10	200
11	220
12	240
13	260
14	280
15	300
16	320
17	340
18	360
19	380
20	400
21	420
22	440
23	460
24	480
25	500
26	520
27	540
28	560
29	580
30	600

