

Disease Control - Pertussis Fact Sheet – October 2010

Background Information

- **Agent:** *Bordetella pertussis*, a gram negative pleomorphic bacillus.
- **Transmission:** Via contact with respiratory tract secretions or droplets of infected persons.
- **Incubation Period:** Commonly 7-10 days (range 4-21 days).
- **Communicability:** Greater in the catarrhal stage before paroxysms. Tapers off until 21 days after onset of paroxysms, if untreated. If treated, 5 days after start of appropriate antibiotics. Secondary attack rate of 70 – 100% among susceptible household contacts.

Clinical Features of Pertussis

- **1st Stage (Catarrhal stage):** Insidious onset of coryza (runny nose) and a mild, occasional cough, similar to the common cold.
- **2nd Stage (Paroxysmal stage):** Cough becomes more severe. Repeated violent coughing episodes without inhalation (paroxysms), ended by characteristic high-pitched inspiratory whoop. Post-tussive vomiting or gagging can occur without whoop. Can last 1-2 months.
- **3rd stage (Convalescent stage):** Gradual recovery. Cough becomes less paroxysmal.
- **Infants (under 6 months of age):** May have cough, choking, apnea, cyanosis, without “whoop” or paroxysms. Leukocytosis and lymphocytosis are common findings during the early paroxysmal stage. Complications include hospitalization, pneumonia, seizures, encephalopathy, and death.
- **Adults/adolescents/immunized children:** Have milder illness, hacking cough, usually with mucus production and occasional paroxysms. Post-tussive vomiting or gagging can occur without “whoop”. Mimics bronchitis.

Assays accepted as Laboratory Confirmation of pertussis

- **Culture:** A negative culture does not rule out the diagnosis. All suspected cases of pertussis should have a nasopharyngeal aspirate or swab obtained for culture from the posterior nasopharynx before starting antibiotics and within 3 weeks of the cough onset.

- **PCR Tests:** The PCR test, when it is available, can greatly aid in the diagnosis of pertussis. Numerous studies have demonstrated the potential for PCR tests to detect *Bordetella pertussis* with greater sensitivity and more rapidly than culture. Positive PCR must also be accompanied by positive clinical signs and symptoms. A specimen obtained by nasopharyngeal swab or aspirate is adequate for the PCR test.
- **Commercially available serologic tests** to detect IgG and IgA antibodies to pertussis toxin are not validated and not generally recommended.
- Consult the Public Health Lab at (951) 358-5070, if technical assistance is needed.

Control Measures

- **Vaccination** of persons who are not up-to-date for pertussis provides long term protection but may not protect close contacts against the current exposure.
 - Children 0-6 years should receive age appropriate DTaP vaccine & Adolescents and adults 10-64 should receive a dose of Tdap if they haven't received a dose.
- An accelerated schedule should be considered during increased disease activity – 1st dose at 6 weeks, 2nd and 3rd doses at 4 weeks. Please refer to California Department of Public Health Pertussis Vaccination Recommendations www.cdph.ca.gov
- Patients are infectious from onset of any catarrhal symptoms until 21 days after onset of paroxysmal cough (if no or partial treatment was given). Communicability ends after 5 days of appropriate antibiotic treatment. Use droplet precautions for all suspected cases: Isolate and provide a face mask for suspect patient to wear. Put the patient in a private room. For transport, patients should be masked and requested to follow respiratory hygiene/cough etiquette.

Close Contact Definition

- Those who have had direct contact with respiratory, oral or nasal secretions from a symptomatic case (catarrhal or paroxysmal stages), e.g., a cough or sneeze in the face, sharing food/eating utensils, kissing, performing a medical examination of the nose and throat, or sharing a confined space in close proximity for a prolonged period of time (≥1 hour) with a symptomatic case.

High Risk Contact Definition

- Contacts at high risk for severe pertussis disease and adverse outcomes include: infants <1 year of age, particularly premature infants, pregnant or recently post-partum women, unimmunized infants and children, immune-compromised persons, persons with neuromuscular disease, persons who have severe underlying disease such as chronic lung disease or cystic fibrosis, or contacts who may transmit pertussis to a high risk person, such as healthcare or childcare workers.

Reporting to Public Health

All confirmed or suspect cases of pertussis should be reported to Disease Control by telephone at (951) 358-5107 or FAX (951) 358-5102. The CMR forms can be obtained by calling (951) 358-5107 or downloaded from the website: <http://www.rivco-diseasecontrol.org/>

Post-exposure Chemoprophylaxis (PEP)

- People with the highest priority for PEP include: close contacts in household, childcare, and healthcare settings; close contacts at high risk for severe disease and adverse outcomes; close contacts who may transmit disease to persons at high risk for severe disease; and close contacts in group settings where close interactions occur (e.g., after-school care groups, playgroups, groups of close friends, teammates, etc.).
- CDC and AAP recommend PEP for all close contacts, regardless of age or immunization status. However, clinicians may elect to recommend PEP for contacts other than those listed above on a case-by-case basis based on length of time from the onset of illness in the case, cough frequency and severity in the case, type of exposure to the contact, and the setting.
- Contacts who have not received PEP should be instructed to monitor themselves closely for catarrhal symptoms for 21 days after last exposure and notify public health if symptoms occur so that antimicrobial treatment/exclusion can be implemented immediately. Untreated contacts, such as healthcare or daycare workers who may transmit pertussis to high risk persons, should be actively monitored for symptoms.
- *Chemoprophylaxis* of close contacts within 2-3 weeks of exposure to an infectious index case may limit transmission of pertussis in households and high risk settings (e.g., residential institutions, hospitals).
- Starting PEP ≥ 3 weeks after exposure to an infectious case is probably of no benefit to the contact.

RECOMMENDED TREATMENT AND POSTEXPOSURE PROPHYLAXIS, BY AGE GROUP				
Age group	Azithromycin	Erythromycin*	Clarithromycin	Alternate agent: TMP-SMX†
<1 month	Recommended agent for infants <1 month; 10 mg/kg per day in a single dose x 5 days	Not preferred; associated with hypertrophic pyloric stenosis in infants <1 month. If azithromycin is unavailable use 40–50 mg/kg per day in 4 divided doses x 14 days	Not recommended	Contraindicated in infants <2 months (risk for kernicterus)
1–5 months	10 mg/kg per day in a single dose x 5 days	40–50 mg/kg per day in 4 divided doses x 14 days	15 mg/kg per day in 2 divided doses x 7 days	Contraindicated in infants <2 months For infants aged > 2 months, TMP 8 mg/kg per day; SMX 40 mg/kg per day in 2 divided doses x 14 days.
Infants aged >6 months and children	10 mg/kg as a single dose on day 1 (maximum 500 mg); then 5 mg/kg per day as a single dose on days 2–5 (maximum 250 mg/day)	See above (maximum 2 g/day)	See above (maximum 1 g/day)	See above
Adolescents and adults	500 mg as a single dose on day 1 then 250 mg as a single dose on days 2–5	2 g/day in 4 divided doses x 14 days *Some experts prefer erythromycin estolate over erythromycin stearate or ethylsuccinate because it achieves higher serum levels with equal doses.	1 g/day in 2 divided doses x 7 days	TMP 320 mg/day, SMX 1600mg/day in 2 divided doses x 14 days †Trimethoprim-sulfamethoxazole (TMP-SMX) can be used as an alternative agent to macrolides in patients aged >2 months who are not pregnant or nursing and are allergic to, cannot tolerate, or are infected with a rare macrolide-resistant strain of <i>B. pertussis</i> .

More materials on pertussis are available at: <http://www.rivco-diseasecontrol.org/> or <http://cdph.ca.gov/HealthInfo/disecond/Pages/Pertussis.aspx>