

Pertussis (Whooping Cough)

1. What are the clinical characteristics of Pertussis?

Catarrhal Stage: Insidious onset of coryza (runny nose), sneezing, and a mild, occasional cough, similar to the common cold. Fever is absent or minimal.

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.

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 during the early paroxysmal stage. Complications include hospitalization, pneumonia, seizures, encephalopathy, and death.

Adults, adolescents and immunized children: Have milder illness, hacking cough, usually with mucus production and occasional paroxysms. Post-tussive vomiting or gagging can occur without whoop. Can mimic severe bronchitis.

Be vigilant! Always observe infants while awake and consider pertussis when a young infant presents with a cough or cold-like symptoms, a child presents with a respiratory illness of unknown cause, or a parent reports a history of paroxysms. Young infants often do not exhibit the whoop and patients may seem asymptomatic between paroxysms.

2. What vaccines are recommended to prevent pertussis?

5 doses of DTaP are recommended for children <7 years of age.

- 3 primary doses of DTaP are routinely recommended at ages 2, 4, and 6 months of age. *During periods of increased pertussis activity providers may consider an accelerated schedule at 6 weeks, 10 weeks, and 14 weeks of age.*
- Boosters are routinely recommended at 15-18 months AND 4-6 years of age.

Tdap vaccine is recommended for individuals > 10 years of age.

A booster dose is needed because vaccine protection decreases over time, with little or no protection 5-10 years following receipt of the last dose.

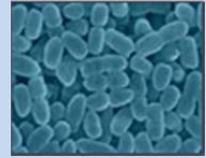
- A dose of Tdap is routinely recommended for pre-teens between 11 and 12 years of age and **adults who have not previously received a Tdap dose.** Boostrix® and Adacel® may be given as early as 10 years of age.

Td should be used for subsequent booster doses. No minimum interval is specified between doses of Td and Tdap.

- Individuals who have close contact with persons <12 months of age and health care personnel with direct patient contact should be prioritized for receipt of Tdap.
- Women of childbearing age should be vaccinated with Tdap.
- One dose of Tdap vaccine is recommended for pregnant women **during each pregnancy** (preferably between 27 and 36 weeks gestation).

Immunity following pertussis illness is not permanent.

The Basics



The Agent

Bordetella pertussis, a gram negative pleomorphic bacillus.

Transmission

Contact with respiratory tract secretions or droplets of infected individuals.

Incubation

Usually 7 – 10 days (range 5-21 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.

Pertussis peaks every 3-5 years.

Vaccination is the best way to prevent pertussis.

Timely reporting is the key to preventing the spread of pertussis.

3. What laboratory tests should be done to confirm a diagnosis of pertussis?

Note: While culture is the gold-standard for diagnosing pertussis, many clinicians only have access to the PCR test.

Culture: Obtain a nasopharyngeal aspirate or swab from the posterior nasopharynx before starting antibiotics and within 3 weeks of the cough onset. Use specially prepared transport media specific for pertussis culture or plate the specimen immediately onto culture media. Bordet-Gengou or Regan-Lowe agar are the only media which can be used for culturing *Bordetella pertussis*. Check with your laboratory beforehand to determine the availability of the correct culture media. Consult the Public Health Lab (562-658-1310) or the Immunization Program (213-351-7800) if technical assistance is needed.

A negative culture does not rule out the diagnosis of pertussis.

PCR Tests: Numerous studies demonstrate the potential for PCR tests to detect *Bordetella pertussis* with greater sensitivity and more rapidly than culture. However, false positive results can pose a problem.

Positive PCR must be accompanied by pertussis clinical signs and symptoms. A specimen obtained by nasopharyngeal swab or aspirate is adequate for the PCR test.

Assays Not Accepted as Lab Confirmation of Pertussis

Direct Fluorescent Antibody (DFA) Tests: The DFA test has variable sensitivity and specificity, resulting in false negative as well as false positive results.

Serological Tests: Serological tests are not yet standardized enough to be highly reliable and are difficult to interpret for previously immunized individuals.

4. What's appropriate treatment and post-exposure prophylaxis?

Regardless of age and immunization status, all cases, their household members, and in some instances other close contacts should receive treatment or post-exposure prophylaxis due to evidence indicating a high risk of pertussis transmission to close contacts. Dosing for post-exposure prophylaxis is the same as for treatment.

Initiating treatment ≥ 3 weeks after cough onset has limited benefit for the patient. Initiating post-exposure prophylaxis ≥ 3 weeks after the last exposure has limited benefit for the contact.



Report Cases Promptly to Prevent Spread

Under the California Code of Regulations, Title 17, Section 2500, all confirmed and suspected cases of pertussis are to be reported to the local health department within one working day.

Do not wait for lab confirmation to report.

For Los Angeles County residents, report to the Morbidity Central Reporting Unit. Call 888-397-3993 or fax a Confidential Morbidity Report (CMR) to 888-397-3778.

Download CMR forms at www.publichealth.lacounty.gov/acd/cdrs.htm or call 213-240-7821.

Download additional resources, including provider and educational materials at www.publichealth.lacounty.gov/ip/DiseaseSpecific/Pertussis.htm and www.eziz.org.

Age	Azithromycin	Erythromycin	Clarithromycin	TPM-SMZ
< 1 month	10 mg/kg as a single dose/day x5 days	Not preferred. Associated with hypertrophic pyloric stenosis	Not recommended. No safety data.	Contraindicated for infants <2 months old.
1-5 months	10 mg/kg as a single dose/day x5 days	40 - 50 mg/kg/day in 4 divided doses x14 days	15 mg/kg/day in 2 divided doses x7 days	ONLY if ≥ 2 months old TMP, 8 mg/kg/day & SMZ 40 mg/kg/day in 2 divided doses
6 months through childhood	10 mg/kg as a single doses on day 1 (max 500 mg) then 5 mg/kg/day (max 250 mg) x4 more days	40 -50 mg/kg/day in 4 divided doses x14 days (max 2 g/day)	15 mg/kg/day in 2 divided doses x7 days (max 1 g/day)	TMP, 8 mg/kg/day & SMZ 40 mg/kg/day in 2 divided doses (max TMP 320 mg/day)
Adult	500 mg single dose on day 1, then 250 mg/day x4 more days	2 g/day in 4 divided doses x14 days	1 g/day in 2 divided doses x7 days	TMP,320 mg/day & SMZ, 1600/mg/day in 2 divided doses x14 days

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