

# PERTUSSIS FACT SHEET

## (Whooping cough)

**Agent:** The bacterium *Bordetella pertussis*.

**Brief Description:** An acute bacterial infection involving the respiratory tract. The initial (catarrhal) stage has insidious onset with irritating cough that can progress to severe paroxysms of cough (paroxysmal stage). Paroxysms are characterized by a series of many coughs without intervening inhalation, often followed by a high-pitched inspiratory “whoop” and vomiting.

Disease in infants younger than 6 months of age may be atypical; apnea is a common manifestation and whoop is often absent. Similarly, older children and adults can have atypical manifestations, with persistent cough and no whoop. In recent years in the United States, pertussis has been recognized with increasing frequency in adolescents and young adults. Many of these cases occur in previously immunized persons and indicate waning immunity following immunization.

Complications of pertussis include seizures, pneumonia, encephalopathy, and death. Disease rates and risk of serious complications, including death, are highest among young children, particularly those younger than 1 year of age.

**Reservoir:** Humans are believed to be the only host.

**Mode of Transmission:** By direct contact with discharges from respiratory mucous membranes of infected persons by the airborne route, probably by droplets. Frequently brought home by an older sibling and sometimes by a parent.

**Incubation Period:** Commonly 7-20 days.

**Clinical Case Definition:** A cough illness lasting greater than or equal to 2 weeks with one of the following: paroxysms of coughing, inspiratory “whoop,” or post-tussive vomiting, and without other apparent cause (as reported by a health professional).

### Lab Criteria for Diagnosis:

- Isolation of *Bordetella pertussis* from a clinical specimen, or
- Positive polymerase chain reaction (PCR) assay for *Bordetella pertussis*.

Note: Direct fluorescent antibody (DFA) testing is available from the Georgia Public Health Laboratory (GPHL) and from many hospital and commercial laboratories. The DFA test is more sensitive than culture, but it is less specific; cases with a positive DFA test only are considered presumptive. Both culture and DFA procedures are recommended for diagnosis of *B. pertussis* whenever possible.

### Diagnostic Testing:

1. Specimen needed: Nasopharyngeal swabs are the specimens of choice, and should be collected as soon as possible after illness onset, preferably before antibiotic treatment. Calcium alginate swabs are superior to other types of swabs.
2. Outfit: Pertussis slide #0525 (for DFA only).
3. Form: For Culture and DFA use #3410. For DFA only use #3415.
4. Lab Test Performed: Isolation and identification of pertussis organism, direct fluorescent antibody exam of smears from swab, and PCR testing of organism.
5. Lab Performing Test: Georgia Bacteriology Laboratory, Georgia Public Health Laboratory (GPHL) in Decatur.
6. Transport requirements:
  - Culture: swab - half-strength charcoal horse blood agar at 4° C; aspirate - in a catheter trap at 4° C.
  - DFA: slides can be prepared directly from swabs, or swabs may be placed in a small volume of casamino acids.

- PCR: swab - short term at 4° C; long term at minus 20° C or colder.

**Case Classification:**

- **Probable:** A case that meets the clinical case definition, is not laboratory confirmed, and is not epidemiologically linked to a laboratory-confirmed case.
- **Confirmed:**
  1. A case that is laboratory confirmed, or
  2. A case that meets the clinical case definition and is epidemiologically linked to a laboratory-confirmed case.

**Comment:** A serology test for pertussis exists but is not acceptable as lab confirmation for surveillance purposes.

**Period of Communicability:** Highly communicable in the early catarrhal stage before paroxysmal cough. Thereafter communicability gradually decreases and becomes negligible in about 3 weeks for non-household contacts, despite persisting spasmodic cough with whoop. When treated with erythromycin, the period of infectiousness is usually 5 days or less after onset of therapy.

**Vaccination:** Beginning in 1996 acellular pertussis vaccines were recommended for all doses in the pertussis vaccine series, replacing the whole-cell vaccines which previously had been used. All acellular vaccines are combined with diphtheria and tetanus toxoid (DTaP vaccine). Children should receive four doses of vaccine, with the first three doses administered at 4- to 8-week intervals, beginning at 6 to 8 weeks of age. The fourth dose should be given 6-12 months after the third dose. No pertussis vaccines are licensed for use beyond the seventh birthday, when vaccine-associated adverse events are thought to be more likely to occur. In children younger than seven years old, DTaP vaccines efficacy ranges from 71% to 84%.

**Treatment:** Erythromycin shortens the period of communicability, but does not reduce symptoms except when given during the incubation period, or in the catarrhal stage or early in the paroxysmal stage of the disease.

**Post-exposure Prophylaxis:** Close contacts under 7 years of age who have not received 4 DTaP/DTP doses or have not received a DTaP/DTP dose within 3 years should be given a dose as soon after exposure as possible. Once nasopharyngeal swabs are taken from household and other close contacts of culture-confirmed cases, a 14-day course of erythromycin or trimethoprim-sulfamethoxazole prophylaxis is recommended, regardless of immunization status and age. Non-household close contact may be described as a person who has direct contact with respiratory secretions from the case.

**Investigation:** The Active Laboratory-Based Pertussis Surveillance Worksheet should be used in conducting a case investigation and should be faxed to the Notifiable Disease Section at the Georgia Division of Public Health (404-657-2608) when completed. Public health officials may coordinate community surveillance to determine the existence and scope of an outbreak. Nasopharyngeal cultures of close contacts should be taken to determine cryptic infections.

**Reporting:** Report cases **IMMEDIATELY** by phone to the local health department, District Health Office, or the Epidemiology Branch at 404-657-2588. If calling after regular business hours, it is very important to report cases to the Epidemiology Branch answering service. After a verbal report has been made, please transmit the case information electronically through the State Electronic Notifiable Disease Surveillance System (SENDSS) at <http://sendss.state.ga.us>, or complete and mail a GA

Notifiable Disease Report Form (#3095). In addition, Districts should complete CDC Form 71.14R, "Pertussis Report Form," and forward it to the Epidemiology Branch.

### Reported Cases of Pertussis in Georgia, 1993-1999

Year	Number of Cases
1993	56
1994	37
1995	30
1996	35
1997	18
1998	38
1999	52

### References:

1. American Academy of Pediatrics. Pertussis. In: Peter G, and Pickering, L, Eds. *2000 Red Book: Report of the Committee on Infectious Diseases*. 25<sup>th</sup> Ed. Elk Grove Village, IL: American Academy of Pediatrics; 2000: 435-448.
2. CDC. Pertussis – United States, January 1992-June 1995. *MMWR* Vol. 44; 1995: 525-529.
3. CDC. Pertussis vaccination: use of acellular pertussis vaccines among infants and young children – recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR* Vol. 46(RR-7), 1997: 1-25.
4. Use of diphtheria toxoid-tetanus toxoid-acellular pertussis vaccine as a five-dose series: supplemental recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR* Vol. 49(RR-13); 2000: 1-8.
5. Manual for the surveillance of vaccine-preventable disease. Centers for Disease Control and Prevention: Atlanta, GA, 1999.
6. Chin J, ed. Pertussis. In: *Control of Communicable Diseases Manual*. 17<sup>th</sup> Ed. Washington, DC: American Public Health Association, 2000: 375-379.
7. De Moissac YR, Ronald SL, Pepler MS. Use of pulsed-field gel electrophoresis for epidemiological study of *Bordetella pertussis* in a whooping

cough outbreak. *J Clin Microbiol* Vol. 32, 1994: 398-402.

8. CDC. *Epidemiology and Prevention of Vaccine-Preventable Diseases*. 6<sup>th</sup> Ed. Public Health Foundation; 2000:67-83.

### Links:

- CDC Pertussis – <http://www.cdc.gov/nip/publications/pink/pert.pdf>
- National Immunization Program – <http://www.cdc.gov/nip/>
- Diphtheria, Tetanus, and Pertussis Vaccine Information Statement - <http://www.cdc.gov/nip/publications/VIS/vis-dtp.pdf>

