

Bordetella pertussis Fact Sheet

Whooping cough (Pertussis) caused by the bacterium *Bordetella pertussis*, is one of the most contagious human diseases. Despite vaccines being introduced in the 1940's this disease continues to pose a significant problem worldwide due to decreased immunity.

General Information

Bacteriology

Bordetella pertussis is an aerobic gram negative coccobacillus that is encapsulated and non-motile. Pertussis has been shown to survive in the air, on surfaces and in organic materials from a few hours up to 7 days and is susceptible to cold temperatures and dessication.

It affects the respiratory tract by producing a tracheal cytotoxin that paralyzes the cilia; fine hair like projections that line the respiratory tract, and prevent the removal of foreign material from the lungs and throat, triggering a coughing spell.

Epidemiology of transmission

Pertussis is easily spread through the air from person to person and through direct contact of respiratory secretions of an infected person. It can be spread to others for up to three weeks after the coughing spells start. Rarely, it can also be transmitted through contaminated objects. Infants are most at risk for severe illness. Adults, who have been immunized, may have a very mild to asymptomatic response to exposure and therefore play a significant role in the spread of pertussis to infants and unimmunized children.

Clinical manifestations

After exposure, the average incubation period is 1 to 2 weeks. The illness then progresses in 2 stages. In the first stage the symptoms are non-specific: runny nose, fever, mild cough and sneezing. Affected persons are very infectious at this stage due to high number of organisms present in the lungs. Cultures are rarely done at this stage due to non-specific symptoms. The second stage is characterized by the sudden onset of severe cough followed by an inspiratory whoop due to rapid gasp for air following a coughing spell. In very young infants symptoms may be less severe or absent.

Basic Prevention

The best way to prevent infection is through immunization. Infants receive a series of 5 shots from 2 through 6 months then again at 4 to 6 years. Immunity fades over time therefore it is important for teens and adults to receive a booster shot every 10 years or less or before contact persons known to be ill with pertussis.

Alcohol-based hand sanitizers (70% ethanol) may be helpful as an adjunct method of hand hygiene, but should not replace washing with soap and water.



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Infection Prevention and Control Measures

Healthcare Prevention Measures

In addition to Routine / Standard Precautions, Droplet and Contact Precautions should be implemented with patients who are suspected or confirmed to have *Bordetella pertussis* infection.

- Patients with suspected or confirmed whooping cough may be placed in private rooms or cohort with other patients with the same infection.
- Follow hand-hygiene guidelines by either carefully washing hands with soap and water or using Alcohol-Based Hand Sanitizers (ABHS) after contact
- Use gowns, gloves, face mask and eye protection when in contact with, or caring for patients and for all interactions that may involve contact with the patient or potentially contaminated areas in the patients environment

Environmental control measures

All horizontal and frequently touched surfaces should be cleaned twice daily and when soiled. All patient care equipment (e.g., thermometers, blood pressure cuff, pulse oximeter, etc.) should be dedicated to the use of one patient. All patient care equipment should be cleaned and disinfected as per Routine / Standard Practices before reuse with another patient or a single use device should be used and discarded in a waste receptacle after use. As stated above, *B. pertussis* is gram negative; therefore a hospital grade disinfectant with claims against gram negative bacteria such as *Escherichia coli* will be sufficient. Toys, electronic games or personal effects should not be shared by patients.

References:

1. Online Textbook of Bacteriology: *Bordetella pertussis* and Whooping Cough. <http://textbookofbacteriology.net/pertussis.html>
2. Public Health Agency of Canada: Pertussis (Whooping Cough) - Fact Sheet. <http://www.phac-aspc.gc.ca/id-mi/pertussis-coqueluche-eng.php>
3. PubMed Health: Pertussis Whooping Cough. <http://www.ncbi.nlm.nih.gov/pubmedhealth/PMH0002528/>
4. Pertussis. <http://en.wikipedia.org/wiki/Pertussis>
5. Centers for Disease Control and Prevention. <http://www.cdc.gov/pertussis/index.html>

