PERTUSSIS (*Bordetella pertussis*) (Whooping cough) Updated 1/23/14

REPORTING INFORMATION

- Report within 24 hours
- Requires completion of WDH pertussis follow-up form
- If patient appears to be from Sweetwater County or Uinta County –coordinate with PHN to determine who will do follow-up
- Laramie and Natrona counties conduct their own follow-up for potential cases of pertussis, for all other counties, report findings to local PHN office

AGENT

Bordetella pertussis

CASE DEFINITION

Clinical criteria: a cough illness lasting at least 2 weeks with one of the following: paroxysms of coughing, inspiratory 'whoop,' or post-tussive vomiting, without other apparent cause (as reported by a health professional).

Laboratory criteria for diagnosis

- Isolation of Bordetella pertussis from clinical specimen **or**
- Positive Polymerase Chain Reaction (PCR)

Case classification

- *Confirmed*: a case that is culture positive and in which an acute cough illness of any duration is present; or a case that meets the clinical case definition and is confirmed by positive PCR; or a case that meets the clinical case definition and is epidemiologically linked directly to a case confirmed by either culture or PCR.

- *Probable*: meets the clinical case definition, is not laboratory confirmed, and is not epidemiologically linked to a laboratory-confirmed case (**even if the laboratory tests are negative**).

Comment

The clinical case definition above is appropriate for endemic or sporadic cases. In outbreak settings, a case may be defined as a cough illness lasting at least 2 weeks (as reported by a health professional). Because direct fluorescent antibody testing (DFA) of nasophayngeal secretions has been demonstrated in some studies to have low sensitivity and variable specificity, such testing should not be relied on as a criterion for laboratory confirmation. Serologic testing for pertussis is available in some areas but is not standardized and, therefore, should not be relied on as a criterion for laboratory confirmation.

SIGNS AND SYMPTOMS

Pertussis usually begins with mild upper respiratory symptoms progressing to an irritating cough (catarrhal stage), that gradually becomes paroxysmal, usually within 1-2 weeks, and may last for 1-2 months or longer (paroxysmal stage). Paroxysms are characterized by repeated violent cough; each series of paroxysms has many coughs without intervening inhalation and can be followed by the characteristic high-pitched whoop or the expulsion of clear mucous often followed by vomiting. Infants under 6 months of age, vaccinated children and adults often do not have the typical whoop or paroxysmal cough.

EPIDEMIOLOGY

Source

Humans are believed to be the only host for pertussis.

Occurrence

Pertussis is an endemic disease common to children worldwide. In countries with high vaccination coverage, the incidence rate in children under 15 is less than 1 per 100,000.

Mode of Transmission
Person-to-person through **droplets** of infected respiratory secretions by the airborne route. Also through direct contact with respiratory, oral, or nasal secretions from symptomatic patient.

Period of Communicability
Generally from illness onset through 3 weeks after cough onset. Cases are most infectious during the first two weeks of cough (the catarrhal stage and beginning of the paroxysmal stage), and are usually considered no longer to be communicable three weeks post-onset of cough *or* after 5 days of appropriate antibiotic treatment even though paroxysmal cough and whooping may persist.

Incubation Period
From 6 to 21 days, usually 7-10 days.

PUBLIC HEALTH MANAGEMENT

Case Investigation
Interview the case (or parents) and others who may be able to provide pertinent information.
Note: If case was reported by laboratory only, or if diagnosis based only on clinical symptoms, you should speak with the health care provider **before** contacting patient.

Obtain the name, and telephone number of all persons who have had *significant* exposure to the case during the communicable period. Identification of contacts is important to determine those requiring chemoprophylaxis as well as to determine if there are additional cases.

Control Measures

Persons having close contact (see below) with an infectious pertussis case should be assessed by a healthcare provider to evaluate the need for antibiotic prophylaxis. In general, antibiotic prophylaxis should be considered for:

- All household contacts.
- Persons who themselves are at high risk of severe illness, or who will have close contact with a person at high risk of severe illness. These include infants, pregnant women in their third trimester, persons with pre-existing health conditions that may be exacerbated by a pertussis infection (for example immunocompromised persons and patients with moderate to severe medically treated asthma), and contacts who themselves will have close contact with either infants, pregnant women, or individuals with pre-existing health conditions at risk of severe illness or complications
- All contacts in high risk settings that might include infants or women in the third trimester of pregnancy. These settings may include, but are not limited to neonatal intensive care units, childcare settings, and maternity wards.

Generally, chemoprophylaxis is recommended within three weeks of exposure to an infectious person. However chemoprophylaxis can be considered for up to six weeks after exposure for high-risk contacts such as infants and pregnant women.

Close contact would include, but not necessarily be limited to:

- Household contacts
- Those having direct face-to-face contact for a period of time with a symptomatic person during the communicable period
- Those sharing a confined space in close proximity for one hour or more with a symptomatic person during the communicable period
- Those having direct contact with respiratory, oral, or nasal secretions from a symptomatic person during the communicable period

Close contacts should be instructed to contact their healthcare provider for the consideration of appropriate chemoprophylactic treatment regardless of symptoms, and for pertussis diagnostic testing if symptomatic. Diagnostic testing for pertussis is not recommended for screening asymptomatic contacts. Close contacts should be assessed for the presence of an otherwise unexplained respiratory illness that could be pertussis and undergo diagnostic testing if symptomatic. Symptomatic contacts should be excluded from work, school, daycare, and other public or group activities until pertussis has been excluded by a healthcare provider, or they have received antibiotic therapy effective against pertussis for at least 5 days.

Low risk contacts for whom a cough watch could be recommended include:

- Persons having only casual contact with the case and no direct contact with oral secretions, e.g., school or work mates
- Persons who had contact only with a high-risk contact, i.e., no direct contact with the case

In certain situations (such as classrooms, office) low risk contacts could be instructed to watch for onset of respiratory illness, particularly cough. Should signs or symptoms develop within the three week incubation period after the last significant exposure to a communicable infected person, they should see a health care provider for an exam, including diagnostic pertussis testing if clinically appropriate.

Vaccination

All contacts should have their immunization status verified and brought up to date if necessary/applicable. The initiation of active immunization following recent exposure is not effective against infection but should be undertaken to protect the child from further exposure in case s/he has not yet been infected. In addition booster tetanus, diphtheria, and pertussis (Tdap) vaccines are now available for use in adolescents and adults (Boostrix, Adacel), and should be considered for use in close-contacts of pertussis cases if they have not previously received a Tdap booster.

Exclusion

Cases should be excluded from school, daycare, or work until they have received 5 days of appropriate antibiotic treatment. If the case refuses treatment, s/he should be excluded from school, daycare or work during the first three weeks of illness.

Treatment

The preferred antimicrobial agents for treatment and prophylaxis of pertussis are the macrolides. Erythromycin, clarithromycin, or azithromycin are appropriate first line agents for treatment or prophylaxis of pertussis. Trimethoprim-sulfamethoxazole can be used as an alternate antimicrobial agent for patients who cannot tolerate macrolides or who are infected with a rare macrolide-resistant strain. The antimicrobial agents and dosages used for chemoprophylaxis of contacts are the same as that recommended for treatment of a clinical case.

Antibiotic treatment shortens the period of communicability, and may reduce symptoms if given early in the illness (catarrhal stage or the beginning of the paroxysmal stage). Penicillins and cephalosporins are not effective against B. pertussis. Fluoroquinolones are not recommended for treatment or prophylaxis of pertussis due to their potential harmful side effects in children and the lack of data demonstrating safety and effectiveness.

Laboratory Testing

Wyoming Public Health Laboratory Protocol for *Bordetella pertussis* testing

The Wyoming Public Health Laboratory (WPHL) offers PCR testing for *B. pertussis.* Collection of one nasopharyngeal swab is recommended. The following materials are needed for specimen collection and can be obtained by way of request from the WPHL:

Healthcare providers may arrange pertussis testing at the WPHL through the Wyoming Department of Health (WDH) Epidemiology Unit (1-307-777-8640 or 1-877-996-9000).

Materials needed for specimen collection:
*One rayon or polyester nasopharyngeal swabs
*Paper sleeve or plastic tube for transport of PCR specimen
*WPHL laboratory requisition form

SUPPLIES ARE AVAILABLE FROM WPHL BY REQUEST

1. Label paper sleeve with patient name, date and source.
2. Obtain nasopharyngeal specimens using the rayon swab on flexible wire.
3. Pass swab through the nose until it touches the posterior nasopharynx.
4. This technique should initiate a cough. Allow the swab to remain for a few seconds after the cough.

5. Remove the swab, cut off the shaft of the swab, if necessary, and insert the swab into the transport sleeve so it can be recapped.
6. Fill out laboratory requisition slip completely and thoroughly and transport immediately to the Wyoming Public Health Laboratory. Specimens for PCR should be left at room temperature or refrigerated.
7. Do not use calcium alginate swabs as they may cause inhibition of PCR techniques.

Contact your local hospital laboratory to check for the availability of a laboratory specimen courier service that will deliver specimens to WPHL. OR ship specimens overnight to:

Wyoming Public Health Laboratory
208 South College Dr.
Cheyenne, Wyoming 82002

For questions concerning the collection and submission of specimens for *Bordetella pertussis*, please call the Wyoming Public Health Lab at (307) 777-7431.

References

1. CDC. Pertussis (Whooping Cough) Postexposure Antimicrobial Prophylaxis. August 2013. http://www.cdc.gov/pertussis/outbreaks/PEP.html
2. Heymann, DL, ed. *Control of Communicable Diseases Manual, 19th edition*. American Public Health Association. 2004.
3. Pickering, LK, ed. *2012 Report of the Committee on Infectious Diseases (Red Book) 29th edition*. American Academy of Pediatrics. 2012.
4. Guidelines for the Control of Pertussis Outbreaks: (http://www.cdc.gov/nip/publications/pertussis/guide.htm)
5. CDC. Recommended Antimicrobial Agents for the Treatment and Postexposure Prophylaxis of Pertussis – 2005 CDC Guidelines. MMWR Recommendations and Reports. Dec 9, 2005/ 54(RR14);1-16.