

PENNSYLVANIA DEPARTMENT OF HEALTH
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Pertussis in Cumberland and Franklin Counties –
New testing guidance



DATE:	11/16/2016
TO:	Health Alert Network
FROM:	Karen M. Murphy, PhD, RN, Secretary of Health
SUBJECT:	Pertussis in Cumberland and Franklin Counties – New testing guidance
DISTRIBUTION:	Cumberland and Franklin Counties
LOCATION:	Southcentral Pennsylvania
STREET ADDRESS:	Statewide
COUNTY:	Statewide
MUNICIPALITY:	Statewide
ZIP CODE:	Statewide

This transmission is a “Health Advisory” that provides important information for a specific incident or situation; may not require immediate action.

HOSPITALS: PLEASE SHARE WITH ALL MEDICAL, PEDIATRIC, INFECTION CONTROL, NURSING, AND LABORATORY STAFF IN YOUR HOSPITAL

EMS COUNCILS: PLEASE DISTRIBUTE AS APPROPRIATE

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PROFESSIONAL ORGANIZATIONS: PLEASE DISTRIBUTE TO YOUR MEMBERSHIP

The Pennsylvania Department of Health released the following statement on November 16, 2016, regarding an outbreak of pertussis in Cumberland and Franklin Counties, new testing guidance (see highlighted section), options for active surveillance, prevention and treatment for those exposed to pertussis.

An outbreak of pertussis is ongoing in Cumberland and Franklin Counties. To date, 50 confirmed and probable cases have been identified. The department is working closely with affected school districts to exclude possible cases of pertussis from school and refer those affected for medical evaluation and treatment. Therefore, the Department of Health recommends the following:

All suspected or confirmed cases should be immediately reported to the Pennsylvania Department of Health at 1-877-PA-HEALTH or to the county state health center where the patient resides.

Nasopharyngeal swabs or washes should be obtained from all suspected cases and sent to both the Pennsylvania Department of Health Bureau of Laboratories and your clinical lab for simultaneous culture testing. Specimen collection and submission guidance at this [link](#). *Bordetella pertussis* bacterial isolates should be forwarded to the Bureau of Laboratories for further characterization.

Consider pertussis when evaluating any infant, child, youth, or adult with an acute cough illness characterized by prolonged cough or cough with paroxysms, whoop, or post-tussive gagging/vomiting. Infants may present with apnea and/or cyanosis.

If a patient is referred to you because s/he has been exposed to pertussis, the following guidelines should be followed:

For Exposed Patients without Symptoms:

As a precaution to protect vulnerable individuals, we are recommending antibiotic prophylaxis for this patient if he or she shares a household with a woman who is pregnant or an infant less than 12 months old. Alternatively, this patient is being referred to you because he or she has an immunodeficiency or lives with a person with an immunodeficiency and may require antibiotic prophylaxis to help prevent pertussis.

For Exposed Patients with Symptoms:

The Pennsylvania Department of Health has developed the following guidelines for assessing and treating patients at this time:

For patients coughing <21 days:

- Collect nasopharyngeal swabs or aspirate for pertussis PCR testing and/or culture.
- Do not delay treatment with appropriate antibiotics while waiting for laboratory results if there is no alternative diagnosis.
- Document and communicate all clinical decisions related to pertussis to the school (this includes children for whom pertussis has been ruled out).
- Strongly consider antibiotic prophylaxis for all household members if a pregnant woman, an infant less than 12 months old, or anyone with a weakened immune system lives in the household.

For patients coughing ≥21 days:

- Testing for pertussis is not recommended. Testing after 3 weeks of cough is of limited benefit since PCR and culture are only sensitive during the first 2-3 weeks of cough when bacterial DNA is still present in the nasopharynx.
- Treatment is no longer necessary after 21 days, with the following exception: infants and pregnant women in their third trimester should be treated up through 6 weeks after cough onset.
- The patient is no longer infectious and can return to school.

For all households

Administer Tdap vaccine to contacts 10 years and older who have not been previously vaccinated with Tdap and to all pregnant women who have not received Tdap during the current pregnancy.

Clinical Course

Pertussis, or whooping cough, is an acute infectious disease caused by the bacterium *Bordetella pertussis*. *B. pertussis* is a small aerobic gram-negative rod. It is fastidious, and requires special media for isolation.

The incubation period of pertussis is commonly 7 to 10 days, with a range of 4 to 21 days, and rarely may be as long as 42 days.

The clinical course of the illness is divided into three stages.

- The first stage, the catarrhal stage, is characterized by the insidious onset of coryza (runny nose), sneezing, low-grade fever, and a mild, occasional cough, similar to the common cold. The cough gradually becomes more severe, and after 1-2 weeks, the second, or paroxysmal stage, begins.
- It is during the paroxysmal stage that the diagnosis of pertussis is usually suspected. Characteristically, the patient has bursts, or paroxysms of numerous, rapid coughs, apparently due

to difficulty expelling thick mucus from the tracheobronchial tree. At the end of the paroxysm, a long inspiratory effort may be accompanied by a characteristic high-pitched whoop. During such an attack, the patient may become cyanotic. Children and young infants, especially, appear very ill and distressed. Vomiting and exhaustion commonly follow the episode. The patient usually appears normal between attacks. Paroxysmal attacks occur more frequently at night, with an average of 15 attacks per 24 hours. During the first 1 or 2 weeks of this stage the attacks increase in frequency, remain at the same level for 2 to 3 weeks, and then gradually decrease. The paroxysmal stage usually lasts 1 to 6 weeks, but may persist for up to 10 weeks. Infants under 6 months of age may not have the strength to have a whoop, but they do have paroxysms of coughing.

- In the convalescent stage, recovery is gradual. The cough becomes less paroxysmal and disappears over 2 to 3 weeks. However, paroxysms often recur with subsequent respiratory infections for many months after the onset of pertussis. Fever is generally minimal throughout the course of pertussis.

Older persons (i.e., adolescents and adults), and those partially protected by the vaccine may become infected with *B. pertussis*, but usually have milder disease. Pertussis in these persons may present as a persistent (>7 days) cough, and may be indistinguishable from other upper respiratory infections. Inspiratory whoop is uncommon.

The most common complication, and the cause of most pertussis-related deaths, is secondary bacterial pneumonia.

Laboratory Testing

Several types of laboratory tests are commonly used for the diagnosis of *Bordetella pertussis*. Culture is considered the gold standard because it is the only 100% specific method for identification. Other tests that can be performed include polymerase chain reaction (PCR) and serology.

Culture

Since culture has excellent specificity, it is particularly useful for confirming pertussis diagnosis when an outbreak is suspected. Many other respiratory pathogens have similar clinical symptoms to pertussis and co-infections do occur. Furthermore, obtaining isolates from culture allows for strain identification and antimicrobial resistance testing. Identifying which strains of *B. pertussis* are causing disease is of public health importance. Culture is best done from nasopharyngeal (NP) specimens collected during the first 2 weeks of cough when viable bacteria are still present in the nasopharynx. After the first 2 weeks, sensitivity is decreased and the risk of false-negatives increases.

PCR

PCR is a rapid test and has excellent sensitivity. **PCR tests vary in specificity, so obtaining culture pertussis culture is recommended within a pertussis outbreak.** Results should be interpreted along with the clinical symptoms and epidemiological information. PCR should be tested from NP specimens taken at 0-3 weeks following cough onset, but may provide accurate results for up to 4 weeks. After the fourth week of cough, the amount of bacterial DNA rapidly diminishes, which increases the risk of obtaining falsely-negative results. PCR assay protocols that include multiple target sequences allow for speciation among *Bordetella* species. The high sensitivity of PCR increases the risk of false-positivity, but following best practices can reduce the risk of obtaining inaccurate results.

Serology

Commercially, there are several different serologic tests used in United States with unproven or unknown clinical accuracy. **The direct fluorescent antibody (DFA) stain** of a nasopharyngeal swab is unreliable so this test **should not be used** to confirm pertussis. Although commercial serologic tests for pertussis

exist, none is currently licensed by the FDA for diagnostic use, and cutoff values for diagnostic values of PT IgG have not been established.

Treatment

Early treatment of pertussis is very important. The earlier a person, especially an infant, starts treatment the better. If treatment for pertussis is started early in the course of illness, during the first 1 to 2 weeks before coughing paroxysms occur, symptoms may be lessened. **Clinicians should strongly consider treating prior to test results if clinical history is strongly suggestive or patient is at risk for severe or complicated disease (e.g. infants).** If the patient is diagnosed late, antibiotics will not alter the course of the illness and, even without antibiotics, the patient should no longer be spreading pertussis.

Persons with pertussis are infectious from the beginning of the catarrhal stage (runny nose, sneezing, low-grade fever, symptoms of the common cold) through the third week after the onset of paroxysms (multiple, rapid coughs) or until 5 days after the start of effective antimicrobial treatment.

A reasonable guideline is to treat persons aged >1 year within 3 weeks of cough onset and infants aged <1 year and pregnant women (especially near term) within 6 weeks of cough onset. The recommended antimicrobial agents for treatment or chemoprophylaxis of pertussis are azithromycin, clarithromycin and erythromycin. Trimethoprim-sulfamethoxazole can also be used.

Symptomatic children and/or adults may return to school, child care group settings, or work after completing the first 5 days of an appropriate antibiotic regimen (see above), but the full course of treatment must be completed.

Exclusion

All students and staff with symptoms of pertussis (i.e., cough) will be excluded from school (1) until they have completed five days of appropriate antibiotic treatment, (2) until pertussis is ruled out (by confirmation of an alternate diagnosis or by resolution of symptoms), or (3) for 21 days from cough onset.

Chemoprophylaxis

The primary objective of postexposure antimicrobial prophylaxis (PEP) should be to prevent death and serious complications from pertussis in individuals at increased risk of severe disease.

With increasing incidence and widespread community transmission of pertussis, extensive contact tracing and broad scale use of PEP among contacts may not be an effective use of limited public health resources. While antibiotics may prevent pertussis disease if given prior to symptom onset, there are no data to indicate that widespread use of PEP among contacts effectively controls or limits the scope of pertussis outbreaks.

Another important consideration is the overuse of antibiotics; CDC is engaged in actively promoting the judicious use of antibiotics among healthcare providers and parents. Given these considerations, **CDC supports targeting postexposure antibiotic use to persons at high risk of developing severe pertussis and to persons who will have close contact with those at high risk of developing severe pertussis.** In response to the growing number of pertussis cases, many state health departments have already implemented similar approaches.

Accordingly, CDC and PADOH support the following:

- **Providing PEP to all household contacts of a pertussis case.** Within families, secondary attack rates have been demonstrated to be high, even when household contacts are current with immunizations. Administration of antimicrobial prophylaxis to asymptomatic household contacts within 21 days of onset of cough in the index patient can prevent symptomatic infection.
- **Providing PEP to persons within 21 days of exposure to an infectious pertussis case-patient who 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 and women in their third trimester of pregnancy** – severe and sometimes fatal pertussis-related complications occur in infants aged <12 months, especially among infants aged <4 months. Women in their third trimester of pregnancy may be a source of pertussis to their newborn infant.
 - **All persons with pre-existing health conditions that may be exacerbated by a pertussis infection (for example, but not limited to immunocompromised persons and patients with moderate to severe medically treated asthma).**
 - **Contacts who themselves have close contact with either infants under 12 months, pregnant women or individuals with pre-existing health conditions at risk of severe illness or complications.**
 - **All contacts in high risk settings that include infants aged <12 months or women in the third trimester of pregnancy.** These include, but are not limited to neonatal intensive care units, childcare settings, and maternity wards.
- A broader use of PEP in limited closed settings when the number of identified cases is small and when a community-wide outbreak is not ongoing; however, **when continued transmission of pertussis is evident, multiple rounds of antibiotics would not be recommended.** Rather than repeating a course of antibiotics, contacts should be monitored for onset of signs and symptoms of pertussis for 21 days.

Vaccination

Any contacts under 7 years of age who are not up to date on their pertussis vaccination should be brought up to date with doses of DTaP using the minimum recommended intervals. Children aged 4-6 years who have completed a primary series but have not received the pertussis vaccination booster dose should be given this dose. Children under 2 months of age may receive a first dose of DTaP at six weeks of age with subsequent doses at 4 week intervals.

Contacts between the ages of seven and ten years of age **who are not up to date on DTaP**, should be given a dose of Tdap and then complete the series with Td using the minimum intervals.

Contacts 10 years of age and over should be given Tdap if they have not previously received a dose of this vaccine.

Any questions or concerns regarding these recommendations should be directed to the PADOH 1-877-PA-HEALTH or your local health department.

More information about pertussis can be found at the CDC Web page:

<http://www.cdc.gov/pertussis/clinical/index.html>

Categories of Health Alert messages:

Health Alert: conveys the highest level of importance; warrants immediate action or attention.

Health Advisory: provides important information for a specific incident or situation; may not require immediate action.

Health Update: provides updated information regarding an incident or situation; no immediate action necessary.

This information is current as of November 16, 2016, but may be modified in the future. We will continue to post updated information regarding the most common questions about this subject.