Washoe County Health District

EPI - NEWS

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PHYSICIAN ALERT:

- Cluster of Pertussis Cases Identified in Washoe County – Early diagnosis and treatment is needed!

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CLUSTER OF PERTUSSIS CASES IDENTIFIED IN WASHOE COUNTY

- EARLY DIAGNOSIS AND TREATMENT IS NEEDED

BACKGROUND

The WCHD has identified a cluster of three pertussis cases associated with one household. Healthcare providers are encouraged to be aware of the laboratory confirmed presence of pertussis in the community and to consider it in the diagnosis of patients with symptoms. Early diagnosis and treatment of suspect pertussis is essential in controlling this disease.

The recently identified cluster consisted of the initial case in a one month old infant and two secondary cases in teenaged children. Household contact was identified as the mode of transmission for the secondary cases. The infant case was hospitalized and admitted to the intensive care unit. To date, 46 contacts have been identified and antibiotic prophylaxis recommended. Investigation of this outbreak is ongoing.

In 2010, the State of California had the highest incidence of pertussis in 52 years. There were 10 infant deaths due to pertussis. As of May 26, 2012, the Centers for Disease Control and Prevention (CDC) has reported a 1.7-fold increase in pertussis reports in the U.S. compared to the same time last year (10,894 cases vs. 6,385 cases respectively). Washington State recently declared a statewide epidemic of pertussis with 1,742 cases, 13.6 times the number reported during this time period in 2011. Oregon State has also reported an increase in pertussis cases. In Nevada, the Southern Nevada Health District (SNHD) has seen a 1.7-fold increase of reported pertussis when compared to last year at this time. To date, the Washoe County Health District (WCHD) has reported six cases of pertussis. The total number of reported cases is similar to the same period in 2011 and 2010.

SYMPTOMS AND TRANSMISSION

Pertussis is a highly-communicable respiratory disease caused by *Bordetella pertussis* that is classically manifested by paroxysmal spasms of severe coughing, whooping, and posttussive vomiting. Major complications are most common among infants and young children and include hypoxia, apnea, pneumonia, seizures, encephalopathy, and malnutrition. **Apnea is a common pertussis symptom in infants and might be the only presenting sign of pertussis in young infants with no cough.** Adults and adolescents have a more variable presentation, ranging from asymptomatic to classic pertussis.

The incubation period for pertussis is 7 to 10 days, with a range of 5 to 21 days. The catarrhal stage is characterized by coryza, sneezing, low-grade fever and a mild cough, and appears similar to the common cold. After about a week, the cough becomes more severe, and the patient enters the paroxysmal stage of the disease. This stage is characterized by paroxysms of coughing, followed by a long inspiratory effort accompanied by a characteristic high-pitched whoop and/or posttussive vomiting. The inspiratory whoop is generally not present in adults or in children who contract mild cases of illness, despite immunization. Pertussis is a toxin-mediated disease, and the symptoms may persist for as long as 10 weeks even with treatment. Patients are most infective during the catarrhal stage and the first 2 weeks of their illness, although the organism can be isolated up to 3 weeks after the onset of paroxysmal coughing.

Transmission occurs through contact with respiratory droplets. Pertussis is highly communicable, as evidenced by secondary attack rates of 80% among susceptible

household contacts. In comparison with other infectious diseases, the basic reproductive number for pertussis is 12-17. This is similar to the communicability of measles for which the reproductive number is 12-18, higher than other well-known infectious diseases. The basic reproductive number is 6-7 for diphtheria; 5-7 for smallpox, polio, rubella; 4-7 for mumps; 2-5 for HIV and SARS; 2-3 for influenza.

LABORATORY TESTING

Pertussis testing should be considered in anybody with a severe or persistent cough. It is appropriate to order testing up to 3 weeks after the onset of paroxysmal coughing. There are several tests that can be used for the diagnosis of pertussis (Table 1). Culture is considered the gold standard and is the most specific of the available tests. However, culture may take as long as two weeks, limiting the usefulness of the results in a clinical setting. Polymerase Chain Reaction (PCR) testing is more sensitive than culture, and can give results much sooner. The CDC recommends that PCR testing be performed **in addition to, not instead of,** culture. DFA testing, although widely available, has very poor specificity and should not be used for laboratory confirmation of disease.

Specimens should be collected from the posterior nasopharynx using a flexible nasopharyngeal swab. For PCR testing, **do not** use calcium alginate swabs as they may contain substances that inhibit PCR. To avoid contamination of clinical specimens with pertussis containing vaccines, change gloves between vaccine administration and clinical specimen collection, and process clinical specimens in an area separate from pertussis containing vaccine storage and administration. Contact the reference laboratory to identify the appropriate swab and transport media to be used for the test ordered. Additional information on sample collection and best practices for healthcare professionals on the use of PCR for diagnosing pertussis is available on the CDC's website at: http://www.cdc.gov/pertussis/clinical/diagnostic-testing/index.html.

Table 1. Pertussis Laboratory Testing*

Laboratory Name	Test Code
LabCorp	
B. pertussis and *B. parapertussis*, real-time DNA PCR	138677
B. pertussis culture	180224
Quest	
B. pertussis and *B. parapertussis*, DNA, Qualitative, real-time PCR	11365
B. pertussis culture	151555
Nevada State Public Health Laboratory	
B. pertussis, nasopharyngeal culture	No code
B. pertussis and *B. parapertussis* real time PCR	No Code

*Contact reference laboratory for their specimen collection and transport media requirements

TREATMENT

Antimicrobial treatment for pertussis is most effective in minimizing the duration and severity of illness if administered during the prodromal period prior to the onset of paroxysmal cough. Table 3.44 contains the treatment and post-exposure prophylaxis recommendations by the AAP and CDC. A patient is no longer considered to be infectious after having taken the appropriate antibiotic for 5 days. Exclude patients with suspect, probable, or confirmed pertussis from childcare, school, and other group activities until 5 days of effective antibiotic treatment (Table 3.44). If you have questions about exclusions, please contact the WCHD Communicable Disease Program at 775-328-2447.

POSTEXPOSURE PROPHYLAXIS

Antimicrobial postexposure prophylaxis (PEP) is effective in preventing illness in persons exposed to pertussis (Table 3.44). PEP should be administered to close contacts who are at high risk for severe pertussis or who could transmit the disease to persons at high risk for severe pertussis. Because infants <1 year of age are considered to be at highest risk for severe illness they are high priority for receiving PEP. Pregnant women (particularly in their 3rd trimesters) are also high priority for receiving PEP because contracting pertussis and being contagious at the time of delivery puts their newborns in danger. Finally, anybody who could expose infants or pregnant women to pertussis is also considered high priority for PEP. Initiation of PEP >3weeks after exposure is probably of no benefit.

VACCINATION

Although most children have been vaccinated, immunity wanes with age, and some who are fully vaccinated can become infected. Adults and vaccinated children with pertussis can present with milder symptoms and hence have become a major reservoir for pertussis. In summary,

- Children need five does of DTaP by kindergarten and an adolescent booster.
- Adults 19 through 64 years of age should receive a single dose of Tdap to replace a single dose of Td for booster immunization against tetanus, diphtheria, and pertussis. Provisionally, ACIP has recommended extending the Tdap recommendation to persons of all ages; the recommendation is currently under review by CDC.
- Pregnant females should receive a single Tdap dose immediately after delivery, if not vaccinated prior to or during pregnancy. If administered during pregnancy the AAP, ACIP, and American College of Obstetricians and Gynecologists recommend administration occur after 20 weeks gestation to minimize the coincidental association with adverse outcomes, which occur most often during the first trimester.
- Adults of all ages (e.g., parents, grandparents, child care providers, healthcare personnel) in contact with infants under age of one should receive a single dose of Tdap.

Please refer to 2012 ACIP recommendation for detailed schedules at CDC's website http://www.cdc.gov/vaccines/recs/provisional/Tdap-feb2012.htm

Per Nevada Administrative Code 441A, all known or suspected cases of pertussis should be reported to the WCHD CD Program by calling (775) 328-2447 or faxing (775) 328-3764.

We would like to thank the Southern Nevada Health District for sharing their newly prepared Technical Bulletin on Pertussis dated on June 14, 2012 for the preparation of this issue of Epi-News - Physician Alert.

Table 3.44. Recommended Antimicrobial Therapy and Postexposure Prophylaxis for Pertussis in Infants, Children, Adolescents, and Adults[a]

Age	Recommended Drugs			Alternative
	Azithromycin	Erythromycin	Clarithromycin	TMP-SMX
Younger than 1 mo	10 mg/kg/day as a single dose for 5 days[b]	40 mg/kg/day in 4 divided doses for 14 days	Not recommended	Contraindicated at younger than 2 mo of age
1 through 5 mo	See above	See above	15 mg/kg per day in 2 divided doses for 7 days	2 mo of age or older: TMP, 8 mg/kg/day; SMX, 40 mg/kg/day in 2 doses for 14 days
6 mo or older and children	10 mg/kg as a single dose on day 1 (maximum 500 mg), then 5 mg/kg/day as a single dose on days 2 through 5 (maximum 250 mg/day)	40 mg/kg/day in 4 divided doses for 7–14 days (maximum 1–2 g/day)	15 mg/kg/day in 2 divided doses for 7 days (maximum 1 g/day)	See above
Adolescents and adults	500 mg as a single dose on day 1, then 250 mg as a single dose on days 2 through 5	2 g/day in 4 divided doses for 7–14 days	1 g/day in 2 divided doses for 7 days	TMP, 320 mg/day; SMX, 1600 mg/day in 2 divided doses for 14 days

TMP indicates trimethoprim; SMX, sulfamethoxazole.

[a]Centers for Disease Control and Prevention. Recommended antimicrobial agents for the treatment and postexposure prophylaxis of pertussis: 2005 CDC guidelines. *MMWR Recomm Rep.* 2005;54(RR-14):1–16

[b]Preferred macrolide for this age because of risk of idiopathic hypertrophic pyloric stenosis associated with erythromycin.

(Source: Red Book 2012)