

Pertussis Update

Critical information about reporting, specimen collection, testing, and vaccination

Purpose of this Technical Bulletin

The Southern Nevada Health District (SNHD) wishes to remind medical providers of the important steps they can take to help prevent a pertussis outbreak from occurring in Clark County.

This bulletin offers detailed information to guide health care professionals in performing three important aspects of pertussis disease prevention.

- reporting
- diagnostic testing
- prevention of pertussis through vaccination and prophylaxis of contacts

Current Situation

Nationwide more than double the number of pertussis cases have been reported so far in 2012 compared with the same timeframe in 2011. The same holds true in Clark County.

A pertussis outbreak in Clark County could affect many residents and would be a serious threat to infants too young to be immunized. Most pertussis deaths occur among this age group. Outbreaks have occurred in other states (including Washington, Minnesota, and Wisconsin) this year and a large outbreak (>9000 cases) occurred in California in 2010. Clark County is at high risk for a pertussis outbreak.

Please refer to the June 2012 Technical Bulletin¹ for more details about the recent increase in pertussis cases, disease symptoms, diagnosis, treatment, prophylactic treatment, and vaccination recommendations.

1. Report Pertussis Cases to Health District

Per Nevada Administrative Code 441A, **all known or clinically diagnosed** cases of pertussis should be reported to the SNHD. Disease Investigation and Intervention Specialists then follow standard public health practice by investigating each case report. The goals of investigating are to:

- Classify the case as confirmed or probable
- Verify that case-patients receive antibiotics
- Ensure preventive treatment of close contacts of the case-patient
- Encourage vaccination of close contacts who are not up-to-date
- Identify symptomatic close contacts
- Facilitate additional diagnostic testing of symptomatic close contacts

Because of the threat of an outbreak, we asked a large local laboratory to notify SNHD of all laboratory requisitions that they receive for pertussis testing of patient specimens. We have observed that very few of these requisitions match reports we had already received, even when suspicion of pertussis was high or had been clinically diagnosed. These cases must be reported to the health district as noted above.

How to report a known or suspected case of pertussis to SNHD:

- By Phone (702) 759-1300 – option 2
- By fax (702) 759-1414 using SNHD's Morbidity Report Form, which can be downloaded from:
<http://www.southernnevadahealthdistrict.org/download/epi/nv-morbidity-form.pdf>
- Online at:
http://www.southernnevadahealthdistrict.org/diseasereports/disease_form.php

Also, through reviews of these requisitions, we learned that a number of pertussis tests ordered were accompanied by the incorrect specimen types and that some orders were for tests other than the recommended PCR and culture. Inappropriate specimen collection or test ordering can result in specimen rejection and subsequent delays in diagnosis confirmation as well as missed opportunities to treat and prevent spread of pertussis.

Please review the following sections for detailed information about correct specimen collection and test selection.

2. Test the Right Patients

Pertussis testing should be considered in any patient with a severe or persistent cough. It is appropriate to order testing up to 3 weeks after the onset of coughing. If the person has already begun a course of antibiotics, culturing specimens for *B. pertussis* is no longer advised, but PCR testing can still sometimes provide useful results. Health district staff members are available for collaborative decision-making about whether or not to test specific patients.

3. Collect the Correct Specimen

The correct technique of specimen collection for pertussis culture or Polymerase Chain Reaction (PCR) is to collect a specimen from the posterior nasopharynx **using a nasopharyngeal (NP) swab**. NP swabs are not the same as anterior nasal swabs. Throat swabs and anterior nasal swabs have unacceptably low rates of DNA recovery and should not be used for pertussis specimen collection. Proper technique for posterior nasopharynx sample collection requires use of a flexible NP swab (Figure). The Centers for Disease Control and Prevention (CDC) offers an online video demonstration of proper nasopharyngeal sample collection and transportation techniques

(<http://www.cdc.gov/pertussis/clinical/diagnostic-testing/specimen-collection.html>).

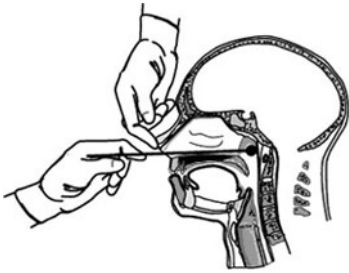


Figure. Specimen Collection from the Posterior Nasopharynx

Image: Manual for the Surveillance of Vaccine-Preventable Diseases, 4th ed., 2008

NP aspirates are also acceptable for culture specimens. 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.

ADVICE: Laboratories use different specimen collection kits and transport media and they must be compatible with the test you order. We recommend you contact

your preferred reference laboratory in advance to discuss their requirements for collection and transport of nasopharyngeal specimens. This might help avoid rejection of test specimens by the lab. The laboratory can assist in identifying and/or obtaining the appropriate swab and transport media to be used for the test ordered. If you send patients to the laboratory, please make sure in advance that the laboratory has the capability of collecting the types of specimens that you order (which should be NP swab for pertussis culture or PCR). Finally, when submitting specimens, always write the specimen source (which should be 'NP' or 'nasopharyngeal' if collection was done according to recommendations) on the requisition form.

4. Order the Right Tests

There are several tests that can be used for the diagnosis of pertussis (Table 2). Culture is considered the gold standard and is the most specific of the available tests. PCR testing is more sensitive than culture, and can give results much sooner. The Centers for Disease Control and Prevention (CDC) recommends that PCR testing be performed **in addition to, not instead of**, culture. Culture is an important test in the current situation because of its high specificity for identifying pertussis. However, during pertussis outbreaks, PCR becomes the more important test. DFA testing, although widely available, has very poor specificity and should not be used for laboratory confirmation of pertussis. Serology is rarely appropriate for pertussis diagnosis.

Table 2. Pertussis Laboratory Testing

Laboratory Name	Test Code
LabCorp	
<i>B. pertussis</i> and <i>B. parapertussis</i> , real-time DNA PCR	138677
<i>B. pertussis</i> culture	180224
Quest	
<i>B. pertussis</i> and <i>B. parapertussis</i> , DNA, Qualitative, real-time PCR	11365
<i>B. pertussis</i> culture	151555
Clinical Pathology Laboratories (CPL)	
<i>B. pertussis</i> , <i>B. parapertussis</i> by PCR	6096
Nevada State Public Health Laboratory	
<i>B. pertussis</i> and <i>B. parapertussis</i> real-time PCR	No Code

5. What else can my practice do to prevent pertussis?

- All members of your medical staff should be vaccinated against pertussis with the Tdap vaccination if they are not known to have had a Tdap dose previously. Tdap vaccine is now considered appropriate for nearly all adolescents and adults.^{2,3} Tdap can be administered regardless of the interval since the last dose of Td and if Tdap vaccination status cannot be confirmed, the patient is considered unvaccinated and therefore eligible to be vaccinated.⁴ According to CDC, "administering a dose of Tdap less than 5 years after Td could provide a health benefit by protecting against pertussis."²
- Encourage or facilitate vaccination of household and other close contacts of your staff members.^{2,3,5}
- Offer Tdap to all of your adult patients. Ask patients whether they have contact with infants. For those who do, encourage vaccination of all persons in contact with those infants.
- Help stop the chain of transmission by prescribing antibiotic prophylaxis (PEP) for persons in close contact with confirmed or probable pertussis case-patients. 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.^{6,7} Initiation of PEP >3weeks after exposure is probably of no benefit. Table 3 contains details about dosing.

- Consider distributing information to all of your patients to help educate them about the need for adults to get Tdap and children to be kept current on pertussis vaccination (Attachment 1). A Spanish version is available on the SNHD website at: <http://www.southernnevadahealthdistrict.org/health-topics/sp-pertussis.php>
- Per CDC recommendations, have your staff triage coughing patients, prioritizing them to be placed in exam rooms as early as possible. When that is not possible, coughing patients should sit away from others in your waiting room and use surgical masks.⁸

References

- ¹ Southern Nevada Health District Office of Epidemiology, Technical Bulletin: Pertussis. June 14, 2012. <http://southernnevadahealthdistrict.org/health-care-providers/tech-bulletin.php>
- ² Centers for Disease Control and Prevention. Tdap Vaccine Recommendations <http://www.cdc.gov/vaccines/pubs/ACIP-list.htm#tdap>
- ³ Centers for Disease Control and Prevention. Tdap Vaccine Recommendations: Tdap and Td Vaccines and Pregnancy <http://www.cdc.gov/vaccines/pubs/ACIP-list.htm#tdappreg>
- ⁴ Centers for Disease Control and Prevention Net Conference Course Number EC2064, Current Issues in Immunization, May 2012. <http://www.cdc.gov/vaccines/ed/ciinc/Pertussis.htm>
- ⁵ Centers for Disease Control and Prevention. DTaP Vaccine Recommendations. <http://www.cdc.gov/vaccines/pubs/ACIP-list.htm#dtap>
- ⁶ Advisory Committee on Immunization Practices (ACIP). Updated Recommendations for Use of Tetanus Toxoid, Reduced Diphtheria Toxoid and Acellular Pertussis Vaccine (Tdap) in Pregnant Women and Persons Who Have or Anticipate Having Close Contact with an Infant Aged <12 Months MMWR. 60(41): 1424-1426. http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6041a4.htm?s_cid=mm6041a4_w
- ⁷ Centers for Disease Control and Prevention. ACIP provisional recommendations for adults aged 65 years and older on use of tetanus toxoid, reduced diphtheria toxoid and acellular pertussis vaccine (Tdap) and guidance on use of Tdap products for adults aged 65 years and older. March 21, 2012. <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6125a4.htm>
- ⁸ Siegel JD, Rhinehart E, Jackson M, Chiarello L, and the Healthcare Infection Control Practices Advisory Committee, 2007 Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings. <http://www.cdc.gov/ncidod/dhqp/pdf/isolation2007.pdf>

Table 3. Recommended Antimicrobial Treatment and Postexposure Prophylaxis for Pertussis by Age Group. (Adapted from The 2009 Red Book Online published by the American Academy of Pediatrics and the CDC Recommendations set forth in Recommended Antimicrobial Agents for the Treatment and Postexposure Prophylaxis of Pertussis. Adapted from MMWR 54(RR14). 1-16.)

Age group	Primary Agents			Alternate Agent *
	Azithromycin	Erythromycin	Clarithromycin	TMP-SMZ
<1 month	Recommended agent: 10 mg/kg per day in a single dose for 5 days (only limited safety data available)	Not preferred: Erythromycin is associated with infantile hypertrophic pyloric stenosis. Use if azithromycin is unavailable; 40–50 mg/kg per day in 4 divided doses for 14 days	Not recommended (safety data unavailable)	Contraindicated for infants aged <2 months (risk for kernicterus)
1-5 months	10 mg/kg per day in a single dose for 5 days	40-50 mg/kg per day in 4 divided doses for 14 days (max of 2grams per day)	7.5 mg/kg per dose, 2 times per day for 7 days	Contraindicated at age <2 months. For infants aged ≥2 months, TMP 8 mg/kg per day, SMZ 40 mg/kg per day, in 2 divided doses for 14 days
Infants (aged >6 months) and children	10 mg/kg in a single dose on day 1 then 5 mg/kg per day (maximum 500 mg) on days 2–5	40-50 mg/kg per day (maximum 2 g per day) in 4 divided doses for 14 days	15 mg/kg per day in 2 divided doses (maximum 1 g per day) for 7 days	TMP 8 mg/kg per day, SMZ 40 mg/kg per day, in 2 divided doses for 14 days
Adults	500 mg in a single dose On day 1 then 250 mg per day on days 2–5	500 mg (base formulation) per dose every 6 hours for 14 days	500 mg per dose 2 times per day for 7 days	TMP 320 mg per day, SMZ 1,600 mg per day, in 2 divided doses for 14 days
Preparation	Oral suspension: 100mg/5ml (15ml) 200mg/5ml (15ml, 22.5ml, 30ml) Tablet: 250 mg 500 mg 600 mg	Oral suspension and tablets: Oral Suspension: 200mg/5ml (100ml) 400mg/5ml (100ml) Tablet: 250mg 500mg	Oral suspension: 125 mg/5 mL (50ml, 100ml) 250 mg/5ml (50ml, 100ml) Tablets: 250 mg 500 mg 500mg xL	Oral suspension: TMP 8 mg/mL and SMZ 40mg/mL Tablets: Single Strength: TMP 80 mg and SMZ 400 mg Double Strength: TMP 160 mg and SMZ 800 mg

*Trimethoprim sulfamethoxazole (TMP–SMZ) can be used as an alternative agent to macrolides in patients aged ≥2 months who are allergic to macrolides, who cannot tolerate macrolides, or who are infected with a rare macrolide-resistant strain of *Bordetella pertussis*.

FactSheet

Para Su Información

Pertussis (Whooping Cough)

What is pertussis (whooping cough)?

Pertussis is a contagious, bacterial respiratory disease. Although pertussis may be a mild disease in older children and adults, in younger children this disease can be complicated by pneumonia and occasionally inflammation of the brain. In rare cases pertussis can cause death (especially in children less than 1 year of age).

Is there a vaccine for pertussis?

Yes. Pertussis vaccine (DTaP) is given at 2, 4, 6, and 12 months of age, and at age 4. At least 3-4 doses are necessary to protect a child from pertussis. Due to an increase of pertussis cases in adolescents and adults, the CDC recommends the Tdap vaccine as follows: Adolescents 11 to 18 years of age should receive the Tdap in place of tetanus and diphtheria (Td) vaccine. 5 Xi lg'g'ci 'Xfyd'UWH YbYl hVccgJf XcgYcZMbi g UbXXjd'h YfJUfHXlj UMBYk Jh HXLd"l bj UMBUHX dfYl bUbhk ca Yb'g'ci 'XfYWj YHXLd Jb'h Yh JfX'cf 'Uy'g'wbXlf)a Ygm'fuzm' &S'k YY_g[YgU]cbE" It is especially important for adults who live with or care for infants to be vaccinated.

What are the symptoms of pertussis?

The symptoms of pertussis usually occur in stages. The first stage usually begins like a cold, with a runny nose, sneezing, low-grade fever and cough. The cough lasts 1 to 2 weeks and then becomes worse. The second stage of pertussis includes uncontrolled coughing spells followed by a whooping noise when a person breathes in. During these severe coughing spells, a person may vomit, or their lips or face may look blue from a lack of oxygen. Between coughing spells, a person may appear well. This stage may last 4 to 6 weeks.

Children and adults partially protected by the vaccine may become infected, but may have a milder

illness than infants and very young children. These people infected with a mild case may not experience any symptoms or have only mild cough, however, they can still transmit the disease to others, including infants too young to be immunized. Infants younger than 6 monthsZUXc YgWblgUbXUXi lg may have a cough that does not include the "whooping" sound.

Who gets pertussis?

Pertussis can occur at any age, but is most commonly reported in children in the first year of life. Infants and young children usually get the disease from an older brother or sister or an adult who may have a mild illness.

How is pertussis spread?

The bacteria which cause pertussis are found in the mouths, noses, and throats of infected people. The bacteria are spread in the air by droplets produced during sneezing or coughing. Once a person is exposed by inhaling these droplets, it takes 7 to 10 days before the first symptoms appear.

How long can a person spread pertussis?

Pertussis is very contagious during the early stage of the illness and becomes less contagious by the end of three weeks. Antibiotics will shorten the contagious period of the illness.

How is pertussis diagnosed?

A doctor may suspect pertussis when someone has the symptoms described above. A sample of mucus from the back of the nose must be taken during the early stage of the illness in order to grow the bacteria. Laboratory tests can be done on the sample to identify the bacteria. Nevada State Laboratory

(continued)

Services performs these tests for doctors or local health departments.

How is pertussis treated?

Infants younger than 6 months of age and people with severe cases often require hospitalization. Severe cases may require oxygen and mild sedation to help control coughing spells. Antibiotics may make the illness less severe if started in the early stage of the disease. Generally, if a person is exposed to pertussis, specific antibiotics may help prevent the disease.

How can the spread of pertussis be prevented?

Prompt use of antibiotics in a household with an active case of pertussis is helpful in limiting other cases. If a case occurs in a child attending a childcare facility, antibiotics should be given to household contacts and other close contacts. Children who develop symptoms within 14 days of exposure should be excluded from childcare facilities until a diagnosis can be made.

Where can I get more information?

Contact your doctor or the Southern Nevada Health District, Office of Epidemiology at (702) 759-1300.



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