

<b>Signs and Symptoms, Duration</b>	<p>A cough illness caused by <i>Bordetella pertussis</i> typically lacking fever characterized by 3 stages:</p> <ol style="list-style-type: none"> <li>1. Catarrhal (1–2 weeks): mild, upper respiratory tract symptoms accompanied by gradual development of an intermittent, non-productive cough.</li> <li>2. Paroxysmal (1–6 weeks or longer): episodes of coughing that may end with gasping and inspiratory whoop, or post-tussive emesis. Adolescents and adults may have less recognizable and distinctive symptoms.</li> <li>3. Convalescent (2–6 weeks or longer): gradual resolution of the paroxysmal episodes.</li> </ol> <p>Apnea may occur in young infants and be the predominant symptom; infants often have elevated white blood count (&gt; 15,000/mm<sup>3</sup>). Serious complications among infants include pneumonia, seizures, pulmonary hypertension, encephalopathy, and death.</p>					
<b>Incubation and Transmission</b>	<p>Usually 7–10 days from exposure to onset of symptoms (range 5–21 days). Transmitted person to person via secretions or droplets. Contagious from onset of first symptoms until <u>at least</u> three weeks after the paroxysmal episodes begin. Antibiotic treatment can shorten contagious period.</p>					
<b>Case classification</b>	<p><b>Clinical definition:</b> A cough illness lasting ≥ 2 weeks, with at least one of the following: Paroxysmal cough episodes; OR Inspiratory whoop; OR Post-tussive vomiting; OR Apnea (with or without cyanosis).</p> <table border="1" data-bbox="321 737 1524 1129"> <tr> <td data-bbox="321 737 646 1129"> <p><b>Confirmed case:</b> A case of acute cough illness of any duration with</p> <ul style="list-style-type: none"> <li>• Isolation of <i>B. pertussis</i> from a clinical specimen OR</li> <li>• PCR positive for <i>B. pertussis</i></li> </ul> </td> <td data-bbox="646 737 1052 1129"> <p><b>Probable case:</b> In the absence of a more likely diagnosis,</p> <ul style="list-style-type: none"> <li>• An illness meeting the clinical criteria, OR</li> <li>• Illness with cough of any duration with at least one of the clinical symptoms, <u>and</u> Contact with a laboratory confirmed case (epi-link)</li> </ul> </td> <td data-bbox="1052 737 1524 1129"> <p><b>Suspect case:</b></p> <ul style="list-style-type: none"> <li>• Cough lasting at least two weeks with no other symptoms, OR</li> <li>• Cough of any duration with one of the case-defining symptoms without lab confirmation or epi-link, OR</li> <li>• Epi-link with cough of any duration and no other symptoms and no lab confirmation, OR</li> <li>• PCR positive for <i>B. Pertussis</i> but no documentation of cough or case-defining symptoms</li> </ul> </td> </tr> </table>			<p><b>Confirmed case:</b> A case of acute cough illness of any duration with</p> <ul style="list-style-type: none"> <li>• Isolation of <i>B. pertussis</i> from a clinical specimen OR</li> <li>• PCR positive for <i>B. pertussis</i></li> </ul>	<p><b>Probable case:</b> In the absence of a more likely diagnosis,</p> <ul style="list-style-type: none"> <li>• An illness meeting the clinical criteria, OR</li> <li>• Illness with cough of any duration with at least one of the clinical symptoms, <u>and</u> Contact with a laboratory confirmed case (epi-link)</li> </ul>	<p><b>Suspect case:</b></p> <ul style="list-style-type: none"> <li>• Cough lasting at least two weeks with no other symptoms, OR</li> <li>• Cough of any duration with one of the case-defining symptoms without lab confirmation or epi-link, OR</li> <li>• Epi-link with cough of any duration and no other symptoms and no lab confirmation, OR</li> <li>• PCR positive for <i>B. Pertussis</i> but no documentation of cough or case-defining symptoms</li> </ul>
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<b>Differential diagnosis</b>	<p><i>Bordetella parapertussis</i>, <i>Bordetella holmesii</i>, other <i>Bordetella</i> species, adenoviruses, respiratory syncytial virus, <i>Mycoplasma pneumoniae</i>, <i>Chlamydia pneumoniae</i></p>					
<b>Treatment</b>	<p>See table in Section 2H. A 5-day course of azithromycin is most frequently prescribed. Antibiotics given early in the catarrhal stage may attenuate disease. When given in the paroxysmal stage, communicability is reduced, but there may be little effect on the course or duration of illness.</p>					
<b>Laboratory</b>	<p>Laboratory tests for pertussis can be done commercially. PCR is currently the most commonly used test. Test early in course of illness, if possible. If culture is positive, isolates must be submitted to WA PHL.</p> <p><b>Nasopharyngeal swab for culture:</b> culture is the most specific test, differentiates <i>Bordetella</i> species, but a negative culture does rule out pertussis. Most sensitive in the first two weeks of illness and in young children.</p> <p><b>Nasopharyngeal swab for PCR:</b> PCR is more sensitive but less specific than culture and does not differentiate between <i>B. Pertussis</i> and <i>B. Holmseii</i>. A negative PCR cannot rule out.</p> <p><b>Store NP swabs in chocolate slant media (for culture) or dry (for PCR) and keep cold.</b></p> <p>There is no role for serology in case ascertainment in WA. (DFA is no longer used for case identification.)</p> <p>Keep isolate (culture) at <b>ambient temperature</b>, other specimens <b>cold</b>, ship according to PHL requirements <a href="https://doh.wa.gov/public-health-provider-resources/public-health-laboratories/lab-test-menu">https://doh.wa.gov/public-health-provider-resources/public-health-laboratories/lab-test-menu</a></p>					
<b>Public Health investigation</b>	<ul style="list-style-type: none"> <li>• Assess the likelihood of pertussis: confirm clinical symptoms, verify vaccination and travel histories.</li> <li>• Exclude cases until completion of the first five days of an appropriate antibiotic. (Full course should be completed.)</li> <li>• Assess transmission risk, especially to infants under the age of one or to pregnant women.</li> <li>• Offer chemoprophylaxis to high risk contacts and recommend symptom watch; test if symptomatic.</li> <li>• Low risk contacts should consult with their healthcare provider about prophylaxis.</li> <li>• See section 7 for guidance on special situations including cases at childcare facilities and schools.</li> </ul>					

# Pertussis

## 1. DISEASE REPORTING

### A. Purpose of Reporting and Surveillance

1. To prevent illness and death, particularly among infants younger than 1 year, and among persons who may transmit pertussis to infants.
2. To limit transmission of pertussis in settings with infants or others who may transmit pertussis to infants.
3. To monitor the epidemiology of pertussis in Washington state.

### B. Legal Reporting Requirements

1. Health care providers and Health care facilities: notifiable to **local health jurisdiction** within 24 hours.
2. Laboratories: notifiable to **local health jurisdiction** within 24 hours; submission required – isolate, within 2 business days; submission on request – if no isolate available, specimen associated with positive result, within 2 business days.
3. Local health jurisdictions: notifiable to the Washington State Department of Health (DOH) Office of Communicable Disease Epidemiology (CDE) within 7 days of case investigation completion or summary information required within 21 days.

### C. Local Health Jurisdiction Investigation Responsibilities

1. Begin routine case investigation within one working day.
2. Prioritize reports to focus on those most likely to be true pertussis and patients who may have exposed high-risk contacts.
3. Make sure the case is appropriately treated and recommend measures to prevent further spread from the case.
4. Identify and evaluate all high-risk contacts; educate and recommend measures to prevent further spread from potentially infected contacts.
5. Report all Confirmed, Probable, and PCR-positive Suspect cases (see Section 3C) to CDE regardless of whether an investigation is performed. Complete the pertussis case report form <https://www.doh.wa.gov/Portals/1/Documents/5100/210-041-ReportForm-Pertussis.pdf> and enter the data in the Washington Disease Reporting System (WDRS).

## 2. THE DISEASE AND ITS EPIDEMIOLOGY

### A. Etiologic Agent

*Bordetella pertussis* is a fastidious gram-negative, toxin-producing bacillus that causes damage to the respiratory tract.

### B. Description of Illness

Classic pertussis, or whooping cough, is characterized by intermittent paroxysms (spasms) of severe coughing lasting from 6–10 weeks. Pertussis typically lacks fever and classically progresses through three stages:

1. Catarrhal (1–2 weeks): mild, upper respiratory tract symptoms gradually develop with an intermittent non-productive cough.
2. Paroxysmal (1–6 weeks or longer): spasms of cough end with a gasp, whoop, or vomiting (post-tussive emesis). Adolescents and adults may have less dramatic symptoms.
3. Convalescent (2–6 weeks or longer): gradual resolution of the paroxysmal coughing.

Pertussis can occur at any age, regardless of vaccination history. Apnea rather than cough may be the initial symptom in young infants. A clue to the diagnosis in **infants only** is an elevated white blood count (over 15,000/mm<sup>3</sup>) with a predominance of lymphocytes. Pertussis among older children, adults, and those previously immunized can be milder than classic whooping cough; the symptoms may be no more distinctive than other upper respiratory tract infections.

Death and serious complications from pertussis occur mainly in infants and can include apnea, pneumonia, pulmonary hypertension, seizures, and encephalopathy. Older individuals may suffer from sleep deprivation, syncope, rib fractures, hernia, and urinary incontinence.

The differential diagnosis of pertussis includes other respiratory pathogens such as adenoviruses, respiratory syncytial virus, *Mycoplasma pneumoniae*, *Chlamydia pneumoniae*, and other *Bordetella* species such as *B. parapertussis* and *B. holmesii*.

*B. parapertussis*, a less common, non-reportable infection, does not produce the pertussis toxin and therefore generally causes milder symptoms. Limited available data suggest that *B. parapertussis* may be less susceptible to antibiotics than pertussis. Although serious complications are rare with parapertussis, infected infants should be treated and chemoprophylaxis should be considered for infant contacts of parapertussis cases. <https://www.cdc.gov/vaccines/pubs/surv-manual/chpt10-pertussis.html> All infected persons should be instructed to avoid contact with infants until they have completed five days of appropriate antibiotic therapy. Pertussis vaccine does not prevent illness from other *Bordetella* species.

### C. Pertussis in Washington State

DOH generally receives approximately 400 to 1,000 reports of pertussis per year with considerable fluctuation. Pertussis incidence increased to epidemic levels in 2012 with 4,918 reports of confirmed and probable cases and an additional 600 reports of persons who tested positive for pertussis by polymerase chain reaction (PCR) but did not meet the required clinical case definition. Reporting levels returned to normal in 2013, but again exceeded epidemic levels in 2015. Since 2015, pertussis reports have remained at expected levels.

### D. Reservoirs

Humans.

### E. Modes of Transmission

*B. pertussis* is transmitted person to person through direct contact with respiratory secretions or via droplets produced from talking or coughing. The precise duration and intensity of exposure needed to cause infection is unclear; an hour or more in a confined space with a contagious individual is generally felt to be a significant exposure. Secondary attack rates have been estimated at 25–60% among household contacts in the developed world but can reach 80% among fully susceptible persons (i.e., neither immunized nor previously infected).

## F. Incubation Period

Typical incubation period is 7–10 days (range 5–21 days).

## G. Period of Communicability

Pertussis is highly contagious. Persons with pertussis are most infectious during the catarrhal period and the first two weeks after cough onset. Communicability then decreases but may continue for three or more weeks after onset of paroxysmal cough. Therefore, cases are contagious from symptom onset to 21 or more days after the start of the paroxysmal cough or until completion of five days of appropriate antibiotic therapy. Without treatment, some individuals, especially infants, may remain culture-positive for several weeks. There is no chronic carrier state; however a recent primate study\* found that individuals (baboons) vaccinated with acellular pertussis vaccine were protected from severe symptoms but not infection and readily transmitted *B. pertussis* to contacts.

\* Warfel, et. al. PNAS, January 14, 2014, vol. 111 no. 2:787-792.

<http://www.pnas.org/content/111/2/787.abstract?sid=27d29c55-2b14-47f0-bbe3-0006619967bb>

## H. Treatment and Post-exposure Chemoprophylaxis

Antibiotics given early in the catarrhal stage may attenuate the disease. When given during the paroxysmal stage, communicability is reduced but there may be little effect on the course or duration of illness. Early treatment of pertussis cases (within first two weeks of paroxysmal cough) is much more effective in preventing secondary spread than treatment started later. Approximately 80–90% of persons with pertussis will spontaneously clear *B. pertussis* from the nasopharynx within three to four weeks, but untreated, unvaccinated individuals such as infants can remain culture positive for more than six weeks. Initiating treatment more than three weeks after onset of paroxysmal cough is unlikely to be beneficial but should be considered in certain situations.

The antibiotics and dosages used for treatment and post-exposure disease prevention are the same (see Table 1 below). A 5-day course of azithromycin is used most frequently for both treatment and chemoprophylaxis. A recent Cochrane Review concluded that a 3-day course of azithromycin was effective in eradicating *Bordetella pertussis* from the nasopharynx with fewer side effects than longer courses. However, data on the effectiveness of the 3-day course are limited, so CDC continues to recommend the 5-day course. (Altunaiji SM, et al. *Cochrane Database of Systematic Reviews* 2007, Issue 3).

For additional information on treatment and post-exposure chemoprophylaxis including recommendations for patients allergic to both macrolides and trimethoprim-sulfamethoxazole, please see:

Recommended Antimicrobial Agents for the Treatment and Postexposure Prophylaxis of Pertussis, 2005 CDC Guidelines. MMWR 2005;54(RR14);1-16 available at <https://www.cdc.gov/mmwr/preview/mmwrhtml/rr5414a1.htm>.

**Table 1: Recommended antimicrobial treatment and post-exposure prophylaxis for pertussis, by age group**

Age group	Primary agents			Alternate agent*
	Azithromycin	Erythromycin	Clarithromycin	TMP-SMZ
Under 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 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	15 mg/kg per day in 2 divided doses 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 (6 months and older) and children	10 mg/kg in a single dose on day 1 (maximum: 500 mg/day) then 5 mg/kg per day on days 2–5 (maximum: 250 mg/day)	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 (maximum: adult dose)
Adults	500 mg in a single dose on day 1 then 250 mg per day on days 2–5	2 g per day in 4 divided doses for 14 days	1 g per day in 2 divided doses for 7 days  Pregnancy category C	TMP 320 mg per day, SMZ 1,600 mg per day in 2 divided doses for 14 days  Pregnancy category C

\* 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 *B. pertussis*.

Source: MMWR 2005;54:RR–14 (Note: Recommendations in the 2012 Red Book vary slightly from the table above.)

## I. Immunity

The duration of immunity after natural infection with *B. pertussis* is believed to wane after 4–20 years.<sup>1</sup> Efficacy of the “whole-cell” vaccines was estimated to be 70–90%, but protection waned after 5–10 years. Since 1997, an acellular pertussis vaccine (DTaP) has been recommended in the United States for the entire childhood series. A 2010 study in California showed an overall DTaP vaccine effectiveness of approximately 89% in 4–10 years old children, however, vaccine effectiveness declined with every year from last dose<sup>2</sup>. Despite suboptimal duration of vaccine immunity, unvaccinated children were found to have 8–9 times higher risk of pertussis than were children who had received five doses of DTaP. Studies estimate Tdap vaccine effectiveness to be 66–92%.<sup>3–7</sup> Immunity from Tdap is also likely to decline over time.

<sup>1</sup> Wendelboe AM, et al. *Pediatr Infect Dis J*. 2005;24(5 Suppl):S58-61. <sup>2</sup>Misegades LK et al. *JAMA* 2012 Nov 28;308(20):2126-32. <sup>3</sup>Schmitt HJ et al. *JAMA* 1996;275:37-41. <sup>4</sup>Gustafsson LH et al. *NEJM* 1996;334:349-355. <sup>5</sup>Ward JI et al. *NEJM* 2005;353(15):1555-63. <sup>6</sup>Rank C et al. *PIDJ* 2000;28(2):152-3. <sup>7</sup>Wei SC et al. *CID* 2010;51(3):315-321.

## 3. CASE AND CONTACT DEFINITIONS

### A. Clinical Criteria for Diagnosis of Cases (clinical case definition)

In the absence of a more likely diagnosis, a cough illness lasting  $\geq 2$  weeks, with at least one of the following signs or symptoms: paroxysms of coughing; OR inspiratory whoop; OR post-tussive vomiting; OR apnea (with or without cyanosis).

### B. Laboratory Criteria for Diagnosis of Cases

- Isolation of *Bordetella pertussis* from clinical specimen or
- Positive polymerase chain reaction (PCR) for *B. pertussis*.

Note: Isolation of *B. parapertussis* or *B. holmesii* is not reportable.

### C. Case Definition (2020)

#### 1. Suspect:

- Cough lasting at least two weeks with no other symptoms, OR
- Cough of any duration with one of the case-defining symptoms without lab confirmation or epi-link, OR
- Epi-link with cough of any duration and no other symptoms and no lab confirmation, OR
- PCR positive for *B. Pertussis* but no documentation of cough or case-defining symptoms

*Though not included in the CSTE pertussis case classifications, DOH collects data on PCR-positive Suspect cases and requests that local health jurisdictions (LHJ) complete WDRS case reports on these cases.*

**2. Probable:**

- In the absence of a more likely diagnosis, illness meeting the clinical criteria,  
OR
- Illness with cough of any duration, with at least one of the following signs or symptoms: paroxysms of coughing; or inspiratory whoop; or post-tussive vomiting; or apnea;  
and  
Contact with a laboratory confirmed case (epidemiologic linkage)

**3. Confirmed:**

Acute cough illness of any duration, with:

- Isolation of *B. Pertussis* from a clinical specimen OR
- PCR positive for *B. Pertussis*

Comments:

- “Epidemiologically-linked” is having close contact with a “Confirmed” case that had a positive pertussis lab test (either culture or PCR). Persons who present with an “epidemiological link” and present with any duration of cough should be classified as “probable”. Without an “epidemiological link”, persons who present with cough of at least two weeks and at least one of the clinical symptoms of pertussis should also be classified as “probable”. An “epidemiological link” without lab confirmation should not be classified as “confirmed”.
- Beginning January 2020, the age of the case will no longer determine the case classification. Cases of all ages will be classified the same. Apnea, previously an infant (age <1 year only) specific clinical symptom, is now a symptom applicable to all ages. The symptom of apnea can be either with or without cyanosis.
- Beginning January 2020, for cases of any age presenting with a cough of **any duration** with lab confirmed pertussis (PCR or culture) will be classified as “confirmed”.
- DFA and serologic tests are not case defining for national reporting purposes.

**D. Close Contact (of a pertussis case)**

Pertussis spreads by direct contact with infectious respiratory secretions by droplet transmission. Such droplets generally travel three feet or less when an infected person talks, coughs, or sneezes. The risk for transmission of pertussis is a function of multiple factors including clinical features of the source case as they relate to communicability (e.g., stage of illness, character of cough), proximity and duration of contact, ventilation, and use of appropriate infection control measures (mask, eye protection). Consult with the Office of Communicable Disease Epidemiology (CDE) as needed on a case-by-case basis regarding determination of who should be considered a close contact.

Examples of close contact include:

1. Direct face-to-face contact with a symptomatic case-patient during the contagious period. This includes household and immediate family members, boyfriends/girlfriends, and childcare contacts (those who spend many hours together or sleep under the same roof).
2. An obvious exposure that involves direct contact with respiratory, oral, or nasal secretions from a case-patient during the contagious period (e.g., a cough or sneeze in the face, sharing eating utensils, sharing water bottles, kissing, mouth-to-mouth resuscitation, or performing intubation or nasotracheal suctioning without a mask).
3. Close proximity for a prolonged period of time with a case-patient during the contagious period. Risk of exposure increases with longer duration and closer proximity of contact.

Examples of non-household members who may be considered close contacts:

- close friends or other social contacts
- some passengers during shared transportation
- some contacts at community activities or at a place of employment
- some healthcare workers caring for a case-patient without wearing a mask
- children attending an after-school care group or play group on the same days

Note: Close contact does not include activities such as walking by a person or briefly sitting across a waiting room or office.

#### E. High-risk Cases and Contacts

High-risk persons include those at increased risk for severe pertussis and those who may transmit pertussis to persons at high risk for severe pertussis. High risk is defined as:

1. Infants < 1 year old
2. Pregnant women (particularly those in their third trimester)
3. Anyone who may expose infants < 1 year old or pregnant women (e.g., members of a household with infants or pregnant women, child care workers who take care of infants < 1 year old, health care workers with face-to-face contact with infants < 1 year old or pregnant women, childbirth educators)

## 4. DIAGNOSIS AND LABORATORY SERVICES

### A. Diagnosis

**Isolation of *B. pertussis* by culture and detection of *B. pertussis* by polymerase chain reaction (PCR) are the only ways to confirm the diagnosis of pertussis for case classification purposes. DFA and serologic tests are not case defining.**

1. Nasopharyngeal Culture: Culture is the most specific test for pertussis and can differentiate between *B. pertussis* and other *Bordetella* species. Culturing specimens from the posterior nasopharynx is most sensitive in the first two weeks of illness and is more sensitive in young children than in adolescents and adults. However, positive nasopharyngeal cultures have occasionally been obtained from untreated adults up to six

weeks after the onset of any symptoms. Because *B. pertussis* is fastidious and its isolation in culture is easily obscured by the growth of other nasopharyngeal organisms, proper specimen collection and subsequent handling of the specimen improve the rate of recovery. Specimens collected after the initiation of antibiotic therapy are less likely to yield *B. pertussis*. Since so many factors can affect the sensitivity of culture for *B. pertussis*, a negative culture result should not be considered evidence that pertussis has been ‘ruled out’. (Throat and anterior nares swabs have unacceptably low rates of recovery of *B. pertussis* and should not be used.)

2. **Polymerase Chain Reaction (PCR):** PCR testing for *B. pertussis* is generally more sensitive than culture but less specific. PCR assays that amplify a single gene target (IS481) do not differentiate between *B. pertussis* and *B. holmesii*. False positive PCR can also occur by contamination from accidental transfer of DNA from environmental surfaces to a clinical specimen. Interpretation of PCR results, especially those with high Ct values, should be done in conjunction with an evaluation of signs and symptoms, knowledge of PCR methodology used by the lab, and available epidemiological information. See “Best Practices for Health Care Professionals on the use of Polymerase Chain Reaction (PCR) for Diagnosing Pertussis” for information on avoiding contamination of clinical pertussis specimens, available at: <https://www.cdc.gov/pertussis/clinical/diagnostic-testing/diagnosis-pcr-bestpractices.html>.
3. **Direct Fluorescent Antibody (DFA) Testing:** A DFA test was often used for screening in the past but lacks sensitivity and specificity for *B. pertussis*. Therefore, use of this test is discouraged.
4. **Serology:** Although serology may have a role in the future, the lack of standardization of these antibody tests and their unknown correlation with pertussis illness limits their current usefulness. However, a positive serology result in a person with recent pertussis symptoms who may expose infants or pregnant women warrants investigation. The optimal time for obtaining pertussis serology is two or more weeks after symptom onset. Local health jurisdiction (LHJ) discretion is advised about the need for further investigation of non-high-risk persons who have a positive serologic test. The best approach in such a situation may be to find an untreated contact with a recent onset of illness and collect specimens for culture and PCR.
5. **Susceptibility Testing:** Routine susceptibility testing of *B. pertussis* isolates is not recommended since resistance to macrolide antibiotics is rare. Consult with the Office of Communicable Disease Epidemiology (CDE) if a patient has a positive *B. pertussis* culture after completion of an appropriate course of antimicrobial therapy and patient compliance with therapy has been verified.

## **B. Tests Available at the Washington State Department of Health Public Health Laboratories (PHL)**

PHL can perform microbiologic cultures and PCR for pertussis on posterior nasopharyngeal specimens. PHL can also confirm that pure isolates submitted from other laboratories are *B. pertussis*.

**Only diagnostic samples meeting criteria below and approved by the local health jurisdiction (LHJ) will be accepted at PHL.** LHJs should notify CDE when they have given approval for pertussis testing at PHL. It is essential to use the PHL-approved collection kits, available upon request from PHL, since these kits may differ from those used by clinical laboratories.

**After LHJ approval, PHL will perform pertussis PCR testing and culture on specimens from the following patients with suspected pertussis:**

1. Healthcare workers.
2. Persons who may have exposed high-risk persons, such as infants < 1 year old, pregnant women, or others who may expose infants or pregnant women (e.g., a new mother who was coughing at the time of delivery, the ill person works in the infant room in a daycare, or the ill person teaches prenatal classes to expectant couples).
3. Infants < 1 year old and pregnant women without healthcare insurance.
4. Patients suspected to be part of an outbreak (per LHJ discretion).

**When no other testing options are available, PHL will perform pertussis culture on specimens from any patient with suspected pertussis after approval from the LHJ.**

### C. Specimen Collection

Detailed instructions for proper specimen collection and submission to PHL are available in Appendix A.

Keep isolate (culture) at **ambient temperature**, other specimens **cold**, ship according to PHL requirements: <https://doh.wa.gov/public-health-provider-resources/public-health-laboratories/lab-test-menu>.

Note that PHL requires all clinical specimens have two patient identifiers, a name **and** a second identifier (e.g., date of birth) both on the specimen label and on the submission form. Due to laboratory accreditation standards, specimens will be rejected for testing if not properly identified. Also include specimen source and collection date.

## 5. ROUTINE CASE INVESTIGATION

**The primary goal of public health agencies is to prevent disease and deaths due to pertussis in infants. If resources are limited, public health agencies should focus on case investigation activities most likely to prevent pertussis in high-risk persons.**

### A. Evaluate the Diagnosis

Review the clinical presentation and laboratory test results. Prioritize reports to focus on those most likely to be true pertussis and patients who may have exposed high-risk contacts (see Section 3E). **Reports with an indication of exposure to high-risk contacts should be highest priority.**

DOH recommends that local health jurisdictions conduct a public health investigation for the following pertussis reports:

- Culture- or PCR-positive cases (includes those whose illness does not yet meet the clinical case definition)

- Epi-linked cases that meet the clinical case definition
- Infants < 1 year of age

DOH also encourages local health jurisdictions to investigate the following reports as resources permit, in order of priority:

1. Cases that meet the clinical case definition but have no epi-link or laboratory confirmation ('Probable' cases)
2. Cases with classic symptoms (paroxysmal cough, post-tussive emesis, whoop, or apnea) and < 2 week cough duration with no testing or a negative test
3. Symptomatic contacts of a case that do not yet meet the clinical case definition

## B. Manage the Case

- Make sure the patient is taking appropriate antibiotic therapy (see Section 2H above).
- Educate the patient about mode of transmission, period of communicability, and need to avoid high risk persons/settings.
- Work, School and Child-Care Restrictions: Recommend that all cases and symptomatic contacts avoid public settings, including child-care, school and work settings, until after completing five days of an appropriate antibiotic (i.e., until day six after starting treatment) or until 21 days after onset of cough if antibiotics are not taken. See [Whooping Cough Fact Sheet for Patients and Their Close Contacts](#)
- Recommend that patients with proven or suspected pertussis are cared for using droplet precautions in healthcare settings; health care workers should wear surgical masks and eye protection when evaluating these patients. Droplet precautions should be maintained until the patient has completed five days of appropriate antibiotic therapy.
- Report all Confirmed, Probable and PCR-positive Suspect cases to the Office of Communicable Disease Epidemiology (CDE) through WDRS using the pertussis case report form <https://www.doh.wa.gov/Portals/1/Documents/5100/210-041-ReportForm-Pertussis.pdf> Enter the vaccination history for all patients younger than 1 year and other patients if possible, especially those 18 years of age and under and pregnant women with pertussis. (Please note pregnancy, when applicable, in the shared notes field).
- As resources permit, follow-up with PCR-positive suspect cases two weeks after onset to determine if they meet the clinical case definition.

## C. Identify Potentially Exposed Persons

1. **Identify high-risk close contacts** (e.g., children < 1 year of age, pregnant women, others who may expose infants and pregnant women) through routine interview of the case or proxy. Low-risk contacts can be identified and managed per local Health Officer discretion.
2. **Identify settings where the case spent time while communicable and where transmission to high-risk contacts may have occurred.** If the case or symptomatic contact spent time in a high-risk setting such as a childcare facility, the facility should be notified.

## 6. MANAGEMENT OF CONTACTS

Public health resources should focus on managing high-risk contacts (see Section 3E). Local health jurisdictions (LHJs) with resources to manage low-risk contacts may do so per local Health Officer discretion.

### A. National Guidance on Management of Pertussis Contacts

*Both the Centers for Disease Control and Prevention (CDC) and the American Academy of Pediatrics recommend that all household and close contacts\* of pertussis cases receive chemoprophylaxis. Healthcare providers should be encouraged to follow these national guidelines. However, because most pertussis in adults and adolescents is neither diagnosed nor reported and antibiotic prophylaxis does not control the transmission of pertussis when it is widespread in the community, DOH recommends that LHJs focus resources on ensuring chemoprophylaxis for high-risk contacts. Ensuring chemoprophylaxis to low-risk contacts is at LHJ discretion and may depend on available resources.*

*\*In November, 2013 the CDC added the following statement to the Outbreak Control section of the Pertussis Chapter in the [Manual for Surveillance of Vaccine-Preventable Diseases](#) “CDC supports targeting PEP 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.”*

### B. Management of High-Risk Contacts

1. Inform high-risk close contacts of their potential exposure and educate them regarding pertussis.
2. Ensure that all high-risk close contacts of a pertussis case receive chemoprophylaxis, either from their healthcare provider or from the LHJ, regardless of immunization status. Ensure that all household contacts of a case receive chemoprophylaxis if any member of that household is considered “high-risk” unless the case is the only high-risk person in the household. Chemoprophylaxis should be implemented as soon as possible and within 21 days of last exposure to the infectious case (see Table 1 for recommended chemoprophylaxis regimens).
3. Counsel high-risk close contacts to watch for signs or symptoms of pertussis occurring within 21 days after the last exposure, even if they have taken chemoprophylaxis, and to contact their healthcare provider if symptoms develop.
4. Facilitate evaluation, testing, treatment, and exclusion of high-risk symptomatic contacts. If these contacts meet the confirmed case definition at the time of initial interview, report them through WDRS.
5. Remind contacts to make sure they are up to date on their pertussis immunizations (see Section 8). Post-exposure vaccination does not replace the need for antibiotic post-exposure chemoprophylaxis, but will help prevent future infections.

### C. Management of Low-Risk Contacts

1. At a minimum, instruct cases with no high-risk close contacts to inform their household contacts and other close contacts of the exposure. Asymptomatic contacts should seek guidance from their own healthcare provider regarding the need for chemoprophylaxis. When low risk contacts have been exposed and there is some likelihood that these

exposed contacts will not receive chemoprophylaxis, local health jurisdictions may consider advising all exposed persons to avoid contact with high risk persons for at least 21 days unless antibiotic chemoprophylaxis is taken. (See section 2.G.) Symptomatic contacts should be evaluated by their healthcare provider for testing and treatment. A [Whooping Cough Fact Sheet for Patients and Their Close Contacts](#) is available on the DOH web site.

Note: The method for communicating with contacts will depend on the situation; schools, childcare settings and organized groups can often be efficiently contacted by letter or email in collaboration with the respective administrators or leaders.

2. If symptomatic contacts of laboratory-confirmed pertussis cases meet the confirmed case definition at the time of initial interview, report them through WDRS if resources permit.

## 7. MANAGING SPECIAL SITUATIONS

### A. Case(s) Works at or Attends Childcare Facility with Children < 1 Year

1. Investigate each case as described in Sections 5 and 6.
2. If a case was present in the childcare while contagious, let them know that the facility must be notified.
3. Notify childcare facility of each case by phone, email or fax.
  - a. Provide pertussis disease control and prevention information to childcare facility.
  - b. Remind childcare facility of obligation to notify parents of the potential exposure (WAC 170-295-3030) and assist facility with preparation of the notification letter.
  - c. Ask about recent cases of cough illnesses among staff and attendees of the facility.
4. Exclude all Confirmed and Probable cases, along with PCR-positive persons who may not yet meet case definition, from childcare until after five days of appropriate antibiotics are completed (the sixth day after starting treatment) or until 21 days after cough onset if antibiotics are not taken.
5. Refer staff and attendees with cough illness for evaluation by a healthcare provider and recommend exclusion from the facility and other public places until pertussis has been treated or another cause of symptoms has been identified
6. Assess potential exposures in the facility, recommend prophylaxis to all childcare contacts, and ensure prophylaxis to classrooms with children < 1 year of age.
7. Implement prospective surveillance for additional cases of cough illness in the facility for 42 days (two incubation periods) from last date of possible exposure in the facility.
8. If cases continue to occur, consult with the Office of Communicable Disease Epidemiology (CDE) regarding management.

### B. Case(s) Works at or Attends Childcare Facility without Children < 1 Year

1. Investigate each case as described in Sections 5 and 6.
2. If a case was present in the childcare while contagious, let them know that the facility must be notified.

3. Notify childcare of each case by phone, email or fax.
  - a) Provide pertussis disease control and prevention information to childcare facility.
  - b) Remind childcare facility of obligation to notify parents of the potential exposure (WAC 170-295-3030) and assist facility with preparation of the notification letter, if needed.
  - c) Ask about recent cases of cough illnesses among staff and attendees of the facility.
4. Exclude all “Confirmed” and “Probable” cases, along with PCR-positive persons who may not yet meet case definition, from childcare until after five days of appropriate antibiotics are completed (the sixth day after starting treatment) or until 21 days after cough onset if antibiotics are not taken.
5. Refer staff and attendees with cough illness for evaluation by a healthcare provider and recommend exclusion from the facility and other public places until pertussis has been treated or another cause of symptoms has been identified.
6. Centers for Disease Control and the American Academy of Pediatrics recommend prophylaxis for all childcare contacts of pertussis cases. Local Health Officers can determine how aggressively to ensure prophylaxis to these contacts. When low risk contacts have been exposed and there is some likelihood that these exposed contacts will not receive chemoprophylaxis, local health jurisdictions may consider advising all exposed persons to avoid contact with high risk persons for at least 21 days unless antibiotic chemoprophylaxis is taken. (See section 2.G.)
7. If multiple cases are identified:
  - a. Ensure that parents have been notified and assist with notification letter as needed.
  - b. Implement prospective surveillance for additional cases of cough illness in the childcare facility for 42 days (two incubation periods) from last date of possible exposure in the facility.

### **C. Case(s) Works at or Attends a School**

1. Investigate each case as described in Sections 5 and 6.
2. If a case was present in the school while contagious, let them know that the school must be notified.
3. Notify school nurse of each case by phone, email or fax.
  - a. Provide pertussis disease control and prevention information to the school.
  - b. Ask about other recent cough illnesses among staff and attendees of the school.
4. Exclude all Confirmed and Probable cases, along with PCR-positive persons who may not yet meet case definition, from school until after five days of appropriate antibiotics are completed (the sixth day after starting treatment) or until 21 days after cough onset if antibiotics are not taken.
5. Refer staff and attendees with cough illness for evaluation by a healthcare provider and recommend exclusion from the facility and other public places until pertussis has been treated or another cause of symptoms has been identified.

6. If cases continue to occur:
  - a. Ensure that parents have been notified and assist with notification letter as needed.
  - b. Consider classroom-wide prophylaxis in classrooms with multiple cases.
  - c. Implement prospective surveillance for additional cases of cough illness in the school for 42 days (two incubation periods) from last date of possible exposure in the facility.

#### **D. Case is a Health Care Worker**

1. Investigate each case as described in Sections 5 and 6.
2. If the case worked while contagious, let them know that their employer must be notified.
3. Ensure that the facility infection control practitioner (ICP) has been notified of the case. If the facility has no ICP, the LHJ may consult with CDE for guidance.
4. The case should be told to stay away from the workplace until five days of antibiotic therapy have been completed, unless pertussis can be excluded as a cause of their symptoms.

The Centers for Disease Control and Prevention recommend chemoprophylaxis for all high-risk close contacts of a pertussis case, including patients (see Section 6A). If patients or healthcare personnel have been exposed in a healthcare setting, chemoprophylaxis is the responsibility of the healthcare facility, in consultation with the LHJ. LHJs with resources to manage low-risk contacts may do so per local Health Officer discretion.

5. Healthcare personnel contacts may remain in the workplace if they comply with prophylaxis and lack respiratory symptoms; they should be under surveillance for 21 days after their last known exposure. When low risk contacts have been exposed and there is some likelihood that these exposed contacts will not receive chemoprophylaxis, local health jurisdictions may consider advising all exposed persons to avoid contact with high risk persons for at least 21 days unless antibiotic chemoprophylaxis is taken. (See section 2.G.)
6. The ICP of the involved facility should identify and refer all symptomatic close contacts (patients and coworkers) for medical evaluation and presumptive treatment immediately.
7. All health care workers with direct patient contact should receive (or have already received) a dose of Tdap unless contraindicated.

#### **E. Outbreak Situations**

Pertussis outbreaks are defined as two or more cases clustered in time (e.g., cases that occur within 42 days of each other) and space (e.g., in a particular child care center or classroom). Please consult with CDE regarding management of pertussis outbreaks as the following information is not comprehensive.

CDC guidance on outbreak management is available at:

<https://www.cdc.gov/vaccines/pubs/surv-manual/chpt10-pertussis.html#outbreak-control>.

## 8. ROUTINE PREVENTION

### A. Immunization Recommendations

<https://www.cdc.gov/mmwr/volumes/69/wr/mm6903a5.htm>

#### 1. Children < 7 years

Immunization with acellular pertussis vaccines in combination with diphtheria and tetanus toxoids as DTaP is recommended for all children younger than seven years of age according to the ACIP schedule.

<https://www.cdc.gov/vaccines/schedules/downloads/child/0-18yrs-child-combined-schedule.pdf>

#### Routine DTaP Vaccination Schedule

Dose	Age	Minimal Interval
Primary 1	2 months	N/A
Primary 2	4 months	4 weeks
Primary 3	6 months	4 weeks
Primary 4	15–18 months	6 months
Booster*	4–6 years	

\* The booster dose is not needed if the fourth dose is given on or after the fourth birthday

For additional information regarding use of the DTaP vaccine during childhood, adverse reactions and contraindications see the most recent Red Book.

#### 2. Persons ≥ 7 years

During spring 2005, two tetanus toxoid, reduced diphtheria toxoid and acellular pertussis vaccine (Tdap) products were licensed in the United State for use in adolescents and adults. BOOSTRIX<sup>®</sup> is licensed for use in persons 10 years and older and ADACEL<sup>®</sup> is licensed for use in persons aged 11–64 years. The Advisory Committee on Immunization Practices (ACIP) currently recommends the following:

- a. Children 7–10 years of age who are not fully vaccinated against pertussis should receive a single dose of Tdap, and continue with Td as needed to complete the series. For complete information on catch up vaccination, see <https://www.cdc.gov/vaccines/schedules/hcp/imz/child-adolescent.html#note-tdap>
- b. Persons aged 11–18 years should receive a single dose of Tdap, preferably at a preventative care visit at age 11–12 years of age. To ensure, continued protection against tetanus and diphtheria, one booster dose of either Td or Tdap should be administered every ten years throughout life.
- c. Person aged 7–18 years who have never been vaccinated against pertussis, tetanus or diphtheria, these persons should receive a series of three tetanus and diphtheria toxoid-containing vaccines, which includes at least one Tdap dose. The preferred scheduled is one dose of Tdap, followed by one dose of either Td or Tdap at least four weeks afterward, and one dose of either Td or Tdap 6–12 months later. Persons aged 7–8 years who are not fully immunized against tetanus and diphtheria should receive

- one dose of Tdap, preferably as the first dose in the catch-up series; if additional tetanus toxoid-containing doses are requested, either Td or Tdap may be used. The vaccination series dose not need to be restarted for those with incomplete DTaP history, regardless of the time elapsed between doses. The catch up schedule and minimum intervals between doses are available here:  
<https://www.cdc.gov/vaccines/schedules/hcp/child-adolescent.html>
- d. Vaccine providers should administer Tdap and tetravalent meningococcal conjugate vaccine (Menactra<sup>®</sup>) to adolescents aged 11–18 years during the same visit if both vaccines are indicated and available.
  - e. All persons aged 19 or over, regardless of the interval since their last tetanus or diphtheria toxoid-containing vaccine, who never received a dose of Tdap should receive one dose of Tdap. If never vaccinated against pertussis, tetanus, or diphtheria, these persons should receive a series of three tetanus and diphtheria toxoid-containing vaccines, which includes at least one Tdap dose. The preferred schedule is one dose of Tdap, followed by one dose of either Td or Tdap at least four weeks afterward, and one dose of either Td or Tdap 6–12 months later. To ensure that there is continued protection against tetanus and diphtheria, booster shots of Td or Tdap should be administered every ten years throughout life.
  - f. Pregnant women should be vaccinated with one dose of Tdap during each pregnancy, regardless of history of vaccination. Tdap should be administered at 27–36 weeks' gestation, preferably during the earlier part of this period, although it may be administered at any time during pregnancy.
  - g. Healthcare personnel in hospitals and ambulatory care settings with direct patient contact who have not previously received Tdap should receive a dose regardless of the interval since the most recent Td.
  - h. For additional information regarding the ACIP DTaP/Tdap/Td ACIP Vaccine Recommendations, see: <https://www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/tdap-td.html>

## B. Prevention Recommendations

In addition to immunization, persons should practice “respiratory etiquette” or good health manners to stop the spread of respiratory pathogens.

### Persons can keep respiratory pathogens to themselves by:

- Covering the nose and mouth with a tissue when sneezing, coughing or blowing the nose.
- Throwing out used tissues in the trash as soon as possible.
- Always washing hands after sneezing, blowing the nose, or coughing, and after touching used tissues or handkerchiefs.
- Washing hands often when sick.
- Using warm water and soap or alcohol-based hand sanitizers to wash hands.
- Staying home if sick.

- Seeing a healthcare provider if febrile or coughing is prolonged, and following their instructions, including taking medicine as prescribed and getting lots of rest.
- If requested, using face masks provided in medical offices or clinic waiting rooms.

**Persons can keep pathogens away by:**

- Washing hands before eating, or touching eyes, nose or mouth.
- Washing hands after touching anyone else who is sneezing, coughing, blowing their nose, or whose nose is running.
- Not sharing things like cigarettes, towels, lipstick, toys, or anything else that might be contaminated with respiratory germs.
- Not sharing food, utensils or beverage containers with others.

## ACKNOWLEDGEMENTS

This document is a revision of the Washington State Guidelines for Notifiable Condition Reporting and Surveillance published in 2002 which were originally based on the Control of Communicable Diseases Manual (CCDM), 17<sup>th</sup> Edition; James Chin, Ed. APHA 2000. We would like to acknowledge the Oregon Department of Human Services for developing the format and select content of this document.

## UPDATES

December 2007:

Section 3D: Revisions were made to the examples of close contact.

Section 6C(2): “Regardless of immunization status” was added to the following statement, “All household members and high-risk asymptomatic close contacts of pertussis cases should receive antibiotic prophylaxis either from their healthcare provider or from the LHI regardless of immunization status.”

December 2008:

Section 3C: Persons with a positive PCR test and a paroxysmal cough of less than 2 weeks duration should be classified as a “suspect” case.

Section 4C: The link to the PHL Microbiology form was updated.

March 2009:

Section 4B: The policy for testing for pertussis at PHL was revised.

October 2009:

Section 4B: The policy for testing for pertussis at PHL was clarified.

January 2011:

The Legal Reporting Requirements section has been revised to reflect the 2011 Notifiable Conditions Rule revision.

June 2012:

Sections 5, 6, and 7: Major revisions were made throughout all sections of the guidelines. Recommendations for case and contact management were changed to focus limited public health resources on prevention of pertussis in high-risk persons.

July 2012:

Section 8: The recommendation for Tdap among persons over 64 years old was updated.

February 2014:

Section 2: Information was included about a 2013 primate study which found that individuals (baboons) vaccinated with acellular pertussis vaccine were protected from severe symptoms but not infection and readily transmitted *B. pertussis* to contacts.

Section 3: The case definition was revised for infants less than one year old in accordance with the January 2014 CSTE changes.

Section 5: Enhanced guidance for entering the vaccination history for all patients younger than one year and other patients if possible, especially for those 18 years of age and under and pregnant women with pertussis.

Section 8: Updated to include the recommendation that pregnant women receive a Tdap each pregnancy.

#### February 2016:

Section 3. C: A comment regarding use of the “Outbreak Case Definition” to classify an epi-linked case with a 2 week cough but without any other case-defining symptoms as a “confirmed” case was removed.

Beginning January 1, 2015 these cases are classified as “suspect” in Washington State.

Here is the language that was removed:

“The clinical case definition is appropriate for endemic or sporadic cases. **In outbreak settings, including households, the clinical case definition may be defined as a cough illness lasting  $\geq 2$  weeks.**

For these reports, the “outbreak-related” box and the “epi-linked” box must both be checked on the WDRS record and cluster/outbreak details should be noted in the LHJ shared notes section, including the name and/or WDRS number of the laboratory-confirmed person to whom the case is epi-linked. An LHJ cluster name/number can be assigned as well. To use the outbreak-related clinical case definition, there must be at least one laboratory confirmed case in the cluster.”

#### February 2021:

Section 3: The case definition was revised in accordance with the January 2020 CSTE update. With this change, cases presenting with cough of any duration with lab confirmation (PCR or culture) should be classified as “confirmed. Apnea (with or without cyanosis) will no longer be an infant specific clinical symptom and is now a clinical feature applicable to all ages. Cough of any duration with clinical features of Pertussis and epi-link will now be classified as “probable”. Cases presenting with at least two weeks of cough or cough and one of the clinical features of Pertussis will be classified as “suspect”.

Section 8: Revised immunization recommendations based on the updated ACIP DTaP/Tdap/Td Vaccine Recommendations from January 2020.

#### March 2022:

Section 3.C: Guideline formatting was changed, and language clarified to make the criteria for each of the two options under the probable case definition more distinct.

#### December 2022:

For 2023 WAC revision combined provider and facility reporting requirement, updated laboratory submission (Section 1B)

December 2023: For 2024 WAC revision updated laboratory submission.

To request this document in another format, call 1-800-525-0127. Deaf or hard of hearing customers, please call 711 (Washington Relay) or email [doh.information@doh.wa.gov](mailto:doh.information@doh.wa.gov).

**APPENDIX A: SPECIMEN COLLECTION PROCEDURES**

The Washington State Public Health Laboratories (WAPHL) can perform pertussis PCR testing and culture for diagnostic purposes. **Healthcare providers must receive approval from their [local health jurisdiction](#) prior to submitting specimens to WAPHL.**

**After approval from the local health jurisdiction, WAPHL will perform pertussis PCR testing and culture on specimens from the following patients with suspected pertussis:**

1. Healthcare workers.
2. Persons who may have exposed high-risk persons, including infants <1 year old, pregnant women or others who may expose infants or pregnant women (e.g., a new mother who was coughing at the time of delivery, the ill person works in the infant room in a daycare, or the ill person teaches prenatal classes to expectant couples)
3. Infants <1 year old and pregnant women without healthcare insurance.
4. Patients suspected to be part of an outbreak (per local health jurisdiction discretion).

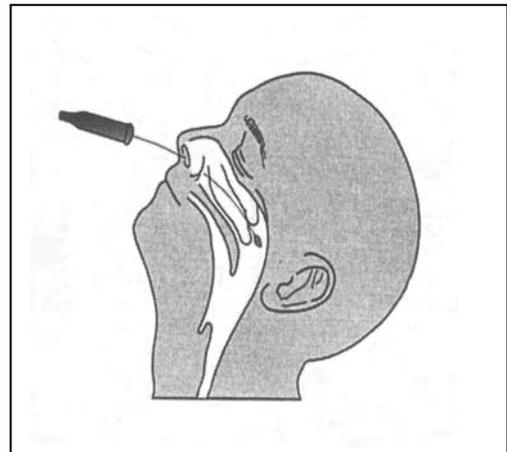
**When no other testing options are available, WAPHL will perform pertussis culture on specimens from any patient with suspected pertussis after approval from the local health jurisdiction.**

**Specimen collection and shipping procedures**

1. If needed, request a *Bordetella pertussis* Collection Kit from WAPHL by calling 206-418-5579. The kit includes appropriate forms, two Dacron® polyester swabs, charcoal media (for pertussis culture), a sterile transport tube (for pertussis PCR), shipping materials and detailed instructions regarding collection and shipping of specimens.
2. Collect posterior nasopharyngeal specimens as soon as possible after symptoms develop using appropriate infection control procedures. Ideally, specimens should be collected within three weeks of onset and before antibiotics are started.

*Note: Throat specimens, nares swabs, and sputum samples are unacceptable specimens and will not be processed.*

3. Use a Dacron® or rayon swab on a flexible wire shaft to collect a nasopharyngeal specimen. Do not use wooden shafted swabs or Calcium alginate swabs (contraindicated for PCR testing). Healthcare providers will need to collect two swab specimens if both culture and PCR are requested. Collecting two swabs at the same time from a single nostril is acceptable.
  - a. Bend wire(s) so that it mimics the curve of the nasal airway.
  - b. Gently pass swab(s) through the nostril to the posterior nasopharynx. **DO NOT** force the swab(s). A slight resistance will be felt when the posterior nasopharynx is reached.
  - c. Rotate the swab(s) and ideally leave in place for 10 seconds or until the patient coughs.



4. Leave the swab on top of the media. Do not stab the swab into the charcoal slant. Cut the top of the wire with scissors so the cap of the media tub can be screwed on. Bending the wire into the tube can introduce contamination (skin flora) into the media. If indicated, place another swab into a sterile screw top transport tube for PCR. If able to collect only one swab, use the charcoal transport media and submit a specimen for culture only. Swabs for PCR will not be accepted without a swab for culture.
5. Label the tubes with the client's name and a second identifier. Acceptable identifiers are name, date of birth, medical record number, and social security number.
6. Complete all sections of the Public Health Laboratories' Nose and Throat form <https://www.medialab.com/dv/dl.aspx?d=1887088&dh=52b1a&u=69790&uh=0e2a1> and include with the specimen
7. Make sure the name and second identifier on the vial match the name and date on the specimen submission form. Specimens without two matching identifiers on the form and tube will be rejected.
8. Ship specimens at ambient temperature so they reach WAPHL within 24 hours of collection. Since January 1, 2007 the required shipping label is "Biological Substance, Category B, UN 3373".

The WAPHL is open to receive pertussis specimens Monday through Friday 8am–5 pm and Saturday 10am–12pm. Specimens should be shipped to:

Washington State Public Health Laboratories  
1610 NE 150<sup>th</sup> Street  
Shoreline, WA 98155

### **Questions?**

Please contact the Special Pathogens Unit of the Communicable Disease Microbiology Laboratory at PHL (general: 206-418-5400, direct 206-418-5452) for handling and transport issues not specifically addressed in these guidelines.

### **Additional resources**

Best Practices for Health Care Professionals on the use of Polymerase Chain Reaction (PCR) for Diagnosing Pertussis

<https://www.cdc.gov/pertussis/clinical/diagnostic-testing/diagnosis-pcr-bestpractices.html>

Pertussis Specimen Collection (includes a video demonstrating proper techniques for collecting and transporting nasopharyngeal specimens for pertussis testing)

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

**APPENDIX B: FLOW CHART FOR PERTUSSIS CASE INVESTIGATIONS**

**Triage reports of pertussis**

**An indication of a high-risk contact/setting will increase the priority of a report.**

Investigations need to be performed even if resources are extremely limited for:

- Culture- or PCR-positive cases (includes those whose illness does not yet meet the clinical case definition)
- Epi-linked cases that meet the clinical case definition
- Infants < 12 months of age

Investigations can be temporarily suspended if resources are limited for (in order of importance):

*(Reports should be entered in WDRS as usual whether further investigated or not.)*

1. Cases that meet the clinical case definition but have no epi-link or lab confirmation ('probable' cases)
2. Cases with classic symptoms (paroxysmal cough, post-tussive emesis, or whooping) and < 2 week cough duration with no testing or a negative test
3. Cases with an epi-link that do not yet meet the clinical case definition (symptomatic contacts of a case)

**Contact Provider**

- Verify that patient is aware of the diagnosis
- Request pertussis immunization history and pertinent clinical information
- Ask about high-risk\* contacts/settings
- Verify appropriate treatment
- Determine what exclusion recommendations were made
- Determine whether high-risk household contacts received chemoprophylaxis

**Interview Patient**

**Case**

- Determine clinical symptoms and onset of illness
- Provide education about period of communicability, method of transmission, and avoidance of high-risk persons/settings
- Recommend avoiding all public settings until 5 days of antibiotics (Day 6) or 21 days after onset of cough if not treated

**Contacts**

- Identify high-risk close contacts\* or setting for follow-up
- If no high-risk close contacts or setting are identified, instruct patient to inform contacts of exposure and to seek advice from their own healthcare provider regarding chemoprophylaxis

**Symptomatic**

**High-risk Close Contacts\***

**Asymptomatic**

**Activities**

- Educate
- Facilitate evaluation, testing, treatment, and exclusion as appropriate
- Notify facility if high-risk setting identified
- Report those who meet clinical case definition

**Activities**

- Educate
- Advise symptom watch
- Facilitate chemoprophylaxis

\*See Section 3E for definition of high-risk contact