

# LOCAL HEALTH DEPARTMENT DISEASE INVESTIGATION STEPS

NC REPORTABLE DISEASE/CONDITION	NC DISEASE CODE	INFECTIOUS AGENT(S)
<b>PERTUSSIS (WHOOPIING COUGH)</b>	<b>47</b>	<b><i>Bordetella pertussis</i></b>

## PREPARING FOR INVESTIGATION

KNOW THE DISEASE/CONDITION	Disease Information
	<ul style="list-style-type: none"> <li>○ Etiologic agent: <i>Bordetella pertussis</i>; a Gram negative aerobic bacillus</li> <li>○ Cough illness with three stages:               <ol style="list-style-type: none"> <li>1. Catarrhal: 1-2 weeks duration</li> <li>2. Paroxysmal: 1-6 weeks duration</li> <li>3. Convalescent: lasts weeks to months</li> </ol> </li> <li>○ Young infants can present with apnea and no other symptoms.</li> <li>○ Incubation Period: 7-10 days (range 4-21 days)</li> <li>○ Infectious Period: Beginning with catarrhal stage until 21 days after cough onset (or completion of 5 days of appropriate antibiotics); highly communicable in first two weeks</li> <li>○ Mode of transmission: Direct contact with discharges from respiratory mucous membranes of infected person by airborne route via large droplets.</li>   <li>○ NC Case Definition: <a href="http://epi.publichealth.nc.gov/cd/lhds/manuals/cd/case_defs.html">http://epi.publichealth.nc.gov/cd/lhds/manuals/cd/case_defs.html</a></li> <li>○ NC DPH CD Manual (<a href="http://epi.publichealth.nc.gov/cd/lhds/manuals/cd/toc.html">http://epi.publichealth.nc.gov/cd/lhds/manuals/cd/toc.html</a>)</li> <li>○ CDC Pink Book (<a href="http://www.cdc.gov/vaccines/pubs/pinkbook/downloads/pert.pdf">http://www.cdc.gov/vaccines/pubs/pinkbook/downloads/pert.pdf</a>)</li> <li>○ APHA Control of Communicable Diseases Manual, 19th edition, pp. 455 - 461.</li> <li>○ Red Book, 2012 Report of the Committee on Infectious Diseases, 29<sup>th</sup> edition; pp. 553 – 566, if applicable.</li>   <li><b>Testing Information</b></li> <li>○ Refer to CDC Pertussis Homepage. <a href="http://www.cdc.gov/pertussis/clinical/diagnostic-testing/diagnosis-confirmation.html">http://www.cdc.gov/pertussis/clinical/diagnostic-testing/diagnosis-confirmation.html</a></li> <li>○ Refer to CDC <a href="#">Best Practices for Health Care Professionals on the Use of Polymerase Chain Reaction (PCR) for Diagnosing Pertussis</a>.</li>   <li><b>Surveillance and Control</b></li> <li>○ Refer to CDC <a href="#">VPD Surveillance Manual, 5<sup>th</sup> ed., 2012, Chapter 10</a>. <a href="http://www.cdc.gov/vaccines/pubs/surv-manual/index.html">http://www.cdc.gov/vaccines/pubs/surv-manual/index.html</a></li>   <li>○ Print and review reporting forms:  <i>Part 1: Confidential Disease Report (DHHS 2124)</i>  <a href="http://epi.publichealth.nc.gov/cd/docs/dhhs_2124.pdf">http://epi.publichealth.nc.gov/cd/docs/dhhs_2124.pdf</a> </li> </ul>

	<p><i>Part 2: Pertussis (DHHS/EPI #47)</i>  <a href="http://epi.publichealth.nc.gov/cd/lhds/manuals/cd/reportforms/pertussis.pdf">http://epi.publichealth.nc.gov/cd/lhds/manuals/cd/reportforms/pertussis.pdf</a></p>
<b>CONDUCTING INVESTIGATION</b>	
<b>COLLECT CLINICAL INFORMATION</b>	<ul style="list-style-type: none"> <li>• Use the <a href="#">Part 2: Pertussis (DHHS/EPI #47)</a> form to organize the relevant information.</li> <li>• Obtain healthcare provider clinical notes from date(s) of service for this disease/condition.</li> <li>• If patient was hospitalized for this disease, obtain medical record (admission note, progress note, lab report(s) and discharge summary).</li> <li>• Look for evidence in the medical record that supports clinical findings described in the case definition.</li> <li>• One of the best questions to ask the provider is, “Why was the patient tested for pertussis?”</li> <li>• When contacting the patient is necessary, discuss with the healthcare provider what the patient has been told about his evaluation for this disease.</li> <li>• Interview the case regarding his/her contact with others during his/her infectious period (beginning of catarrhal stage to 3 weeks after cough onset).</li> <li>• If the case travelled out of state or travelled using mass transit (e.g. by plane) during his/her infectious period, contact CD Branch at (919) 733-3419 within 24 hours so that persons in other jurisdictions may be contacted.</li> <li>• Obtain immunization history.</li> </ul>
<b>REVIEW LABORATORY INFORMATION</b>	<ul style="list-style-type: none"> <li>• Obtain a copy of positive PCR, culture and serology reports if performed.</li> <li>• Acceptable diagnostic tests for surveillance and reporting purposes are PCR and culture from nasal pharyngeal (NP) or nasal aspirate specimens. Sensitivity of these tests varies and can decrease with antibiotic treatment, delayed collection or collection technique. Consider the results in conjunction with these concerns, as false negatives may occur.</li> <li>• If needed, refer to <a href="#">CDC Best Practices for HCPs on Use of PCR for Diagnosing Pertussis</a>.</li> <li>• Serological Testing: <ul style="list-style-type: none"> <li>○ No commercially available serologic method for diagnosis of pertussis has been validated between laboratories or has been approved for diagnostic use in the U.S. Positive IgM and IgG for pertussis are not confirmatory, but do require follow-up to establish if the patient met the clinical case definition for pertussis.</li> <li>○ Serologically tested patients who meet the probable case definition should be investigated to assess the need for prophylaxis, testing and treatment of contacts.</li> <li>○ A validated serologic test is available through the State Laboratory of Public Health if needed for epidemiologic reasons- e.g. testing of a possible case-patient who has been coughing for &gt;2 weeks and has a large number of high-risk contacts. Prior approval from the CD Branch is required.</li> </ul> </li> <li>• Contact the healthcare provider if further testing of the patient is</li> </ul>

	necessary.
<b>APPLY THE CASE DEFINITION</b>	<ul style="list-style-type: none"> <li>Use the <a href="#">case definition</a> for pertussis to determine if the clinical and laboratory findings meet the case definition criteria.</li> </ul>
<b>IMPLEMENTING CONTROL MEASURES</b>	
<b>ATTEMPT TO IDENTIFY SOURCE OF EXPOSURE</b>	<ul style="list-style-type: none"> <li>Use the <a href="#">Part 2: Pertussis (DHHS/EPI #47)</a> form to guide the interview and collect relevant information.</li> <li>Interview contacts to gather necessary information including: <ul style="list-style-type: none"> <li>Symptoms of pertussis</li> <li>Date of last exposure to case</li> </ul> </li> </ul>
<b>MANAGEMENT OF CONFIRMED OR PROBABLE CASES AND CONTACTS</b>	<ul style="list-style-type: none"> <li>Determine infectious period.</li> <li>Verify that case has been appropriately tested, treated and isolated during the infectious period.</li> <li>Identify all contacts of case during infectious period who have had <ul style="list-style-type: none"> <li>Face to face contact within 3 feet</li> <li>Direct contact with respiratory, oral or nasal secretions</li> <li>Shared same confined space in close proximity for &gt;1 hour</li> </ul> </li> <li>Target antibiotic prophylaxis to all household contacts, contacts that are at high risk of developing severe pertussis and contacts that will have close interaction with those at high risk of developing severe pertussis.</li> <li>Manage contacts based on time since last exposure to case, type of contact, presence of symptoms and risk status. Refer to CDC Postexposure Antimicrobial Prophylaxis document.</li> <li>Symptomatic contacts should be referred to healthcare provider for evaluation. Isolate/exclude until no longer infectious.</li> <li>Asymptomatic household contacts should receive prophylaxis if within 3 weeks of onset of cough in the index patient and be instructed to self-monitor for symptoms for 3 weeks after last exposure.</li> <li>Asymptomatic "high risk" and contacts that have close interactions with "high risk" persons should receive prophylaxis if within 3 weeks of last exposure and be instructed to self-monitor for symptoms for 3 weeks after last exposure.</li> <li>Asymptomatic non-high risk contacts should be instructed to self-monitor for symptoms for 3 weeks after last exposure.</li> </ul>
<b>MANAGEMENT OF SUSPECTED PERTUSSIS CASES &lt;2 WEEKS COUGH DURATION</b>	<ul style="list-style-type: none"> <li>To determine the best course of action, consider epidemiologic and clinical factors to evaluate level of suspicion and discuss with CD Branch if uncertain. <ul style="list-style-type: none"> <li>Epidemiological factors: <ul style="list-style-type: none"> <li>Is the suspected case a contact of a confirmed or probable case?</li> <li>Do any contacts have undiagnosed, prolonged cough illnesses?</li> <li>Is the suspect case vaccinated? With how many doses? How</li> </ul> </li> </ul> </li> </ul>

	<p>long ago did he/she receive them?</p> <ul style="list-style-type: none"> <li>▪ Is there a community-wide pertussis outbreak?</li> <li>▪ Are the contacts of this suspected case at high risk for developing complications from pertussis (some examples include infants or pregnant women)?</li> </ul> <p>○ Clinical factors:</p> <ul style="list-style-type: none"> <li>▪ Is there another more likely cause of the illness?</li> <li>▪ Does the suspected case have whoop, paroxysms or post-tussive vomiting?</li> <li>▪ Disease presentation varies with age and history of previous exposure or vaccination. Young infants can present with apnea and no other symptoms. Adults and adolescents with some immunity can exhibit only mild symptoms or have the typical prolonged paroxysmal cough yet still transmit infection.</li> </ul> <ul style="list-style-type: none"> <li>• If the suspected case has not been tested, recommend culture and PCR testing. <ul style="list-style-type: none"> <li>• When suspicion of pertussis is low, the investigation can be delayed until there is laboratory confirmation of the diagnosis. However, <u>prophylaxis of infants and their household contacts should not be delayed because pertussis can be severe and life-threatening to young infants.</u></li> <li>• When pertussis is strongly suspected, attempts to identify and provide prophylaxis to high risk contacts should proceed without waiting for laboratory confirmation.</li> </ul> </li> <li>• Follow up with the case for at least 2 weeks after cough onset to determine if the clinical case definition is met.</li> </ul> <p><b>If lab result is PCR+:</b></p> <ul style="list-style-type: none"> <li>• Even if a laboratory has validated its PCR method, the result should be considered presumptive, and isolation of <i>B. pertussis</i> by culture should always be attempted to ensure that the disease is truly pertussis.</li> <li>• PCR positive results in a suspect case that has not met the probable case definition should be evaluated together with epidemiological and clinical factors (described above).</li> <li>• Positive PCR results should raise the index of suspicion.</li> <li>• Follow case for at least 2 weeks from cough onset to determine if clinical case definition is met.</li> </ul>
--	--

<b>REPORTING INVESTIGATION</b>	
<b>REPORT TO THE NC COMMUNICABLE DISEASE BRANCH (CD)</b>	<ul style="list-style-type: none"> <li>• Review the document “Pointers for Completing Pertussis Reports in NC EDSS”, in the NC EDSS section of the NC CD Manual.</li> <li>• Enter Part 1 and Part 2 Communicable Disease Reports into NC EDSS as a new event, or update the existing event if already entered.</li> <li>• Assign event to State Disease Registrar when case investigation is complete.</li> <li>• Do “Event_Print” in NC EDSS after assigning to the state. Keep for one year along with any additional notes. Maintain as a surveillance file, not a medical record.</li> </ul>
<b>CASE FINDING</b>	<ul style="list-style-type: none"> <li>• Contacts of the case who have met the case definition (even in the absence of laboratory confirmation) should be investigated and reported.</li> <li>• Maintain surveillance for 2 incubation periods (42 days) after last report of confirmed case.</li> <li>• During the course of the investigation, look for symptoms of the disease in other exposed individuals (other infants in daycare or household contacts, for example).</li> <li>• Refer symptomatic individuals to healthcare provider for evaluation.</li> </ul>
<b>SPECIAL CONSIDERATIONS</b>	
<b>INFECTION CONTROL</b>	<ul style="list-style-type: none"> <li>• Symptomatic persons should refrain from public activities and stay home from school or work for the first 5 days of a full course of antimicrobial treatment.</li> <li>• Symptomatic persons who do not take antimicrobial treatment should refrain from public activities and stay home from school or work for 21 days from onset of cough.</li> <li>• Droplet precautions should be used for all suspected or confirmed cases in healthcare settings until completion of 5 days of appropriate antibiotic therapy or until 21 days from cough onset.</li> </ul>
<b>OUTBREAKS</b>	<ul style="list-style-type: none"> <li>• Culture confirmation of pertussis for at least one suspected case is recommended any time there is suspicion of a pertussis outbreak.</li> <li>• The primary goal of pertussis outbreak control efforts is to decrease morbidity (amount of disease) and mortality (death) among infants; a secondary goal is to decrease morbidity among persons of all ages.</li> <li>• The efficacy of Tdap in controlling school or institutional outbreaks has not been evaluated.</li> <li>• For community outbreaks, take steps to increase adult and adolescent Tdap coverage. If indicated, submit Outbreak Summary Report within 30 days from end of outbreak</li> </ul>

<p><b>RISK COMMUNICATION</b></p>	<ul style="list-style-type: none"> <li>• Outbreaks of this disease in child care or schools will generate concern among parents, health professionals, and the media. Be prepared to answer questions and offer preventative measures. The CD Branch and Immunization Branch have resources to assist. In school settings, the School Health Nurse Consultants are also a valuable resource for school nurses.</li> <li>• Outbreaks may require NC HAN alerts, provider communications, and/or press releases.</li> <li>• NC DHHS Communications Office (919-855-4840) is available to assist local health departments as needed.</li> </ul>
<p><b>SPECIAL SETTINGS</b></p>	<p><b>Schools and Child Care Facilities-</b></p> <ul style="list-style-type: none"> <li>• Consider using the contact investigation worksheet to organize information (available in CD manual). Determine which students and staff may be contacts to the case. In a school setting, contacts may include (but are not limited to) these groups: <ul style="list-style-type: none"> <li>• Children attending regular after-school care groups or activities with the case-patient</li> <li>• Core groups of close friends, social contacts, boyfriend or girlfriends</li> <li>• Students who work closely with the case-patient</li> <li>• Students sitting next to a case-patient in school, or in the same extracurricular activities, including field trips</li> <li>• Bus seat-mates and carpool contacts</li> <li>• Contacts in regular social activities or jobs</li> </ul> </li> <li>• Request that the school notify the parents of identified contacts that their child may have been exposed to pertussis and provide them with information on what to do. A sample letter is available in the CD Manual (<a href="#">enter link here</a>).</li> <li>• Consider notifying all parents/guardians in the school or class (depending on situation) that a pertussis case has been identified and provide information about pertussis to them. A sample letter is available in the CD Manual.</li> <li>• Assess vaccination status of exposed staff and students.</li> <li>• Provide age-appropriate immunizations to staff and students with no immunity to pertussis.</li> <li>• Students and staff with symptoms of pertussis should be treated and excluded from school until they have completed 5 days of antibiotic treatment.</li> </ul> <p><b>Healthcare Settings-</b></p> <ul style="list-style-type: none"> <li>• PEP is necessary for exposed healthcare personnel who have contact with persons at risk for severe disease. Other healthcare personnel either should receive PEP or be monitored for 21 days after pertussis exposure and treated and isolated at the onset of signs and symptoms of pertussis. Staff with symptoms of pertussis should be treated and excluded from work until they have completed 5 days of antibiotic treatment.</li> <li>• Assess immunization status of all staff, including persons involved in</li> </ul>

	<p>direct patient care (e.g. nurses, physicians, phlebotomists) as well as persons who work in the patient care setting (e.g. clerical staff, front office staff, technicians).</p> <ul style="list-style-type: none"><li>• Provide age-appropriate immunizations to staff with no immunity to pertussis per ACIP guidance.</li></ul>
--	---