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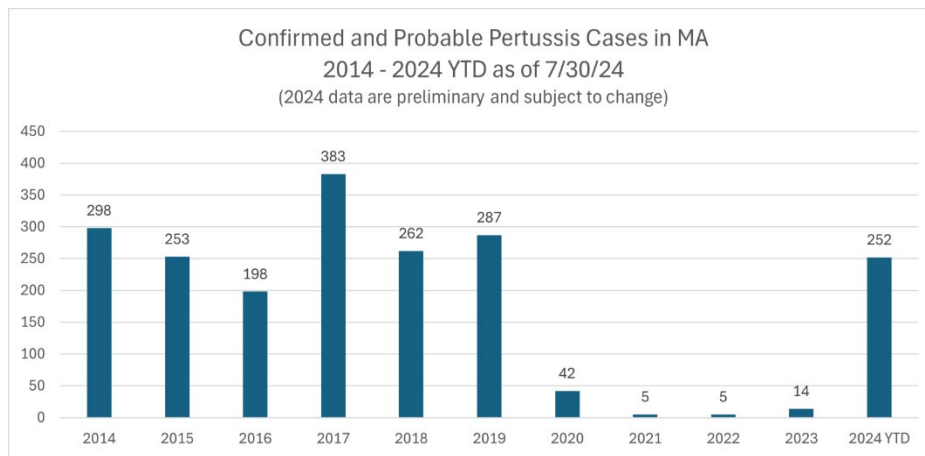
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Clinical Advisory August 20, 2024

Pertussis is spreading in Massachusetts, particularly among adolescents. A high index of suspicion for pertussis is recommended in patients of any age with prolonged cough, regardless of vaccination status.

Increasing Pertussis Cases in Massachusetts

Pertussis, also known as "whooping cough," is a highly contagious acute respiratory illness caused by the bacteria *Bordetella pertussis*. Following a significant decline during the COVID-19 pandemic, cases of pertussis in Massachusetts are increasing to pre-pandemic levels, particularly among adolescents. Cases to date in 2024 have been distributed evenly among males and females. 75% of cases have been in adolescents (age 11-19), with an average age of seventeen. Cases have included several outbreaks among high school aged youth. Less than one percent of cases have been in children under six years of age.



MDPH Recommendations for Healthcare Providers

1. Ensure all patients are up to date on DTaP and Tdap vaccines.
2. Maintain a high index of suspicion and include pertussis in the differential diagnosis for patients in all age groups who present with prolonged cough illness, regardless of vaccination status.
3. Test patients who have symptoms of pertussis. CDC and MDPH recommend the use of PCR together with culture for the diagnosis of pertussis. However, PCR testing may be more clinically useful than culture as PCR testing is more readily available at hospital and commercial labs and results are available quickly. Serology should be considered when appropriate. See recommendations below regarding laboratory testing.

4. Initiate treatment promptly. The earlier antibiotics are started, the more effective they are at preventing transmission and possibly modifying illness.
5. Pertussis cases and symptomatic close contacts should be excluded from public activities including work/school/camp until they have completed five days of appropriate antibiotic treatment.
6. Provide key information to local public health and/or MDPH epidemiologists when they call. Cough onset date, symptoms, and vaccination history help us determine whether formal public health control recommendations should be made.
7. Call 617-983-6800 with any questions and ask to speak with an epidemiologist or call your local board of health.

Vaccination Offers the Best Protection

Pertussis vaccines continue to provide the best protection from pertussis and its complications. The United States uses two types of combination vaccines to protect against pertussis: DTaP (for children under 7 years old) and Tdap (for older children and adults). Vaccination is very effective at preventing serious illness and hospitalization related to pertussis. However, the vaccines are not 100% effective in preventing pertussis infection and protection wanes over time. Ensure that patients and staff are up to date with DTaP and Tdap. To reduce the risk of pertussis in new birth parents and their infants (young infants are particularly vulnerable to severe pertussis), the Advisory Committee on Immunization Practices (ACIP) recommends that pregnant people receive a dose of Tdap vaccine during each pregnancy. In addition to maternal vaccination, other family members of newborn infants should confirm that they are up to date with pertussis vaccination to protect themselves and the infant from severe pertussis.

Clinical Description

The clinical presentation of pertussis is variable and its diagnosis challenging. Classically, pertussis begins with mild upper respiratory tract symptoms (catarrhal stage, lasting 1–2 weeks) and can progress to severe paroxysms of cough (paroxysmal stage, lasting 2–6 weeks), often with a characteristic respiratory whoop, which may be followed by vomiting. Although children can be exhausted after paroxysms, they usually appear relatively well between episodes. The cough is often worse at night. Cyanosis and apnea may occur; fever is absent or minimal.

Disease in infants younger than 6 months of age may be atypical. Very young infants may present with apnea and no other symptoms. In those with cough, whoop may be absent. Unvaccinated or incompletely vaccinated infants younger than 12 months of age have the highest risk for severe and life-threatening complications, hospitalization, and death. Older children and adults also can have atypical manifestations, with persistent cough and no whoop, or they may present with more classic symptoms. Family members are the most likely sources of infection of pertussis in infants. In the most recent years, siblings have emerged as an important source.

The differential diagnosis for pertussis often includes infections due to mycoplasma pneumoniae, chlamydia pneumoniae, respiratory syncytial virus (RSV), adenovirus, and Bordetella species other than Bordetella pertussis (e.g., *B. parapertussis* and *B. holmseii*).

Despite increasing awareness and recognition of pertussis as a disease that affects adolescents and adults, pertussis is overlooked in the differential diagnosis of cough illness in this population. Also, adolescents and adults often do not seek medical care until several weeks after the onset of their illness. In addition to the pathogens listed above, the differential diagnosis of prolonged cough, includes non-infectious causes, such as bronchospasm, gastroesophageal reflux disease, post viral bronchospasm, sinusitis, and chronic lung disease.

Laboratory Testing

Laboratory confirmation of pertussis is important because other pathogens can cause symptoms similar to pertussis. Whenever possible, a nasopharyngeal (NP) swab or aspirate should be properly obtained from all suspected cases (videos demonstrating specimen collection technique are linked below). There are three types of acceptable diagnostic tests for pertussis:

- **Polymerase Chain Reaction (PCR):** PCR testing of NP swabs can be an important tool for the rapid diagnosis of pertussis. PCR testing is more sensitive than culture, however PCR testing is less specific than culture. The high sensitivity of the test means false positive results may be obtained, particularly in asymptomatic patients. Only patients with signs and symptoms of pertussis should be tested. PCR is most reliable within the first four weeks after onset of cough and before the initiation of antibiotic therapy. However, treatment should not be postponed for testing. PCR testing is available at hospital and commercial laboratories with results usually available within 1-2 days.
- **Culture:** A positive culture for *B. pertussis* from an NP swab obtained from a person with a cough illness confirms the diagnosis of pertussis. Although a positive culture result is very specific for the diagnosis of pertussis, it is relatively insensitive. Factors that decrease the sensitivity of bacterial culture include duration of symptoms two weeks or greater prior to collection of NP swab, recent antibiotic use, prior pertussis vaccination and specimen transit time and conditions. Amies swabs must be received within 24 hours of collection; for all other collections, it is recommended to send same day delivery or overnight and to ship with coolant. If specimen is in transit > 1 day, recovery of *Bordetella* may be reduced/compromised. Culture for pertussis is available at the Massachusetts State Public Health Laboratory (MA SPHL) and at some diagnostic laboratories. The average turnaround time for a culture result is 14 days, though positive cultures may be identified sooner. Contact the Clinical Microbiology lab at 617-983-6607, M-F 8am-4pm, with any questions regarding *Bordetella* culture testing.
- **Serology:** A single-point serologic assay has been validated at MA SPHL for persons aged 11 years or older and is used for clinical diagnosis and reporting. **Only those serologic assays performed at the MA SPHL are acceptable for laboratory confirmation.** The turnaround time may be a week or more. Serology (performed at the MA SPHL) is most sensitive 2–8 weeks after onset of cough. Because some commercially available serologic tests have unproven or unknown clinical accuracy, pertussis serology results from laboratories other than the MA SPHL and the CDC are not accepted as diagnostic for pertussis by the MDPH or CDC.

Culture and serologic testing are available at no charge at the MA SPHL. The appropriate pertussis diagnostic test and specimen type is based on patient age and cough duration, as described in the table below. The reliability of each test depends on age and stage of disease.

Time Since Cough Onset	Recommended Diagnostic Testing for Patients <11 Years of Age	Recommended Diagnostic Testing for Patients ≥11 Years of Age
<14 days	NP swab for culture and PCR. Serologic testing is not valid in children <11 years of age.	NP swab for culture and PCR
14 – 28 days		Serology at MA SPHL ¹ -OR Serology at MA SPHL, and consider NP swab for culture and PCR
29 – 56 days		Serology at MA SPHL

¹Serologic results for patients ≥11 years of age who have received a pertussis-containing vaccine (Tdap) within the past 3 years are not interpretable. Detected antibodies in these individuals may be the result of either past vaccination and/or recent infection. Instead, consider submission of an NP swab for pertussis PCR and culture testing if within the appropriate time interval relative to cough onset. As more data become available about the persistence of antibody after receipt of Tdap, this interval for interpretation may be adjusted.

Test kits for pertussis culture: NP specimen collection kits for pertussis culture can be ordered from the MA SPHL Kit Room at (617) 983-6640 or by email at: masphl.specimenkitorders@mass.gov. Due to the short shelf life of the NP test kits, order only the quantity to be used immediately. All specimens must be accompanied by a fully completed MA SPHL [Specimen Submission Form](#). Instructions for specimen collection are included in the kits. NP Specimen kits will be processed and sent out within 2-5 business days upon receipt of order excluding delays due to backordered inventory. IMPORTANT NOTE: No pertussis specimen kits are shipped on Fridays due to the perishable components but can be picked up at the MA SPHL laboratory.

Treatment

The earlier antibiotics are started, the more effective they are in preventing disease transmission to others. The symptoms of pertussis may be ameliorated if treatment is begun early, during the catarrhal stage. If begun later in the course of illness, treatment will decrease the infectious period but may not decrease the duration of cough or severity of disease. Clinicians should begin antimicrobial therapy prior to test results if the clinical history is strongly suggestive of pertussis or the patient is at high risk of severe or complicated disease [for example: infants <1 year of age (particularly those <6 months of age); immunocompromised individuals; individuals with chronic lung disease (including asthma and cystic fibrosis)].

Postexposure Antimicrobial Prophylaxis

Administer a course of antibiotics to high priority close contacts within 3 weeks of exposure, including the household contacts of the case. High priority close contacts for prophylaxis include people who are at increased risk of severe disease (infants, immunocompromised people, pregnant people in the third trimester) or who live or work in close proximity to those at increased risk of severe disease (e.g., in a NICU, infant daycare, or school for students with special medical needs). Local health departments and school nurses usually take the lead in identification of close contacts. In general, a healthcare provider who is masked while providing care to a patient with pertussis is not considered exposed.

Broad-based use of antibiotic prophylaxis is not recommended (e.g., for an entire classroom, grade, or school). There are no data to indicate that widespread use of PEP among contacts effectively controls or limits the scope of pertussis outbreaks. Prophylaxis has become much more targeted at those at high risk of developing complications, as well as for those who could potentially transmit disease to high-risk patients. However, a broader use of PEP may be appropriate in limited closed settings when the number of identified cases is small and there is not a community-wide outbreak. MDPH and local boards of public health are available to assist with developing prophylaxis recommendations.

Disease Reporting and Questions

Confirmed cases of pertussis are reportable to your local board of health. For questions about pertussis and diagnostic testing, please call an epidemiologist at the Massachusetts Department of Public Health at 617-983-6800.

Clinical Resources

[CDC Symptoms of Whooping Cough](#)

[CDC Postexposure Antimicrobial Prophylaxis Guidance](#)

[CDC Pertussis Vaccination Recommendations](#)

[CDC Pertussis Treatment Recommendations](#)

[CDC Video: Collecting a Nasopharyngeal Swab](#)

[CDC Video: Collecting a Nasopharyngeal Aspirate](#)

Resources for Local Health

[MDPH Pertussis Chapter](#)