

STATE OF NEW YORK DEPARTMENT OF HEALTH

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To: Hospitals, Providers and Local Health Departments

From: NYSDOH Bureau of Communicable Disease Control,
Immunization Program

HEALTH ADVISORY: INCREASE IN PERTUSSIS CASES IN NEW YORK STATE

Please distribute immediately to the Infection Control Department, Emergency Department, Employee Health Service, Infectious Disease Department, Director of Nursing, Medical Director, Laboratory Service, and all patient care areas.

SUMMARY

- The New York State Department of Health (NYSDOH) has received reports of increased pertussis activity. The probable and confirmed case reports from January 1, 2006, through November 30, 2006, total 920 compared to 642 for the same time period in 2005.
- All regions of the state have been affected. Examples of counties currently reporting activity include Montgomery, Onondaga, Herkimer, Orange, Delaware, Lewis, and Broome counties.
- Recommendations for case management and outbreak controls were updated by the Centers for Disease Control and Prevention (CDC) in December 2005. A summary of these treatment and control measures are included in this document.
- The Advisory Committee on Immunization Practices (ACIP) has issued recommendations for the routine use of Tdap (tetanus, diphtheria and attenuated pertussis) vaccine for adolescents and adults. A summary of these recommendations are included in this document.
- All suspect, probable, or confirmed pertussis cases need to be reported to the local health department in the county in which the individual resides.

BACKGROUND

Outbreaks of pertussis have been reported throughout New York State in 2006. Although the reported case numbers are not as high as in 2004, these outbreaks continue to significantly impact schools and communities. As one example, since October 2006, there has been a significant increase in reported pertussis cases in Montgomery County. As of December 11, 2006, Montgomery County reported 53 confirmed cases occurring primarily in the Fonda and Fort Plain School districts. Ages of the cases range from 5-18 years with most being in the 9th grade. In addition, two parents have also been reported as confirmed cases. Exposures to neighboring counties of Fulton, Herkimer, Saratoga, Ulster, Albany, Schenectady and Rensselaer have occurred due to contact through activities such as sports, school, band and employment.

Montgomery County has completed extensive contact investigations and recommended appropriate testing and treatment for identified cases as well as prophylaxis for close contacts. Providers, schools and the communities have been educated about pertussis testing, treatment and prevention. Special emphasis has been made concerning the use of Tdap vaccine to increase communitywide immunity. Letters have been sent home in the school districts. Local providers, hospitals and urgent care sites have been notified.

CLINICAL PRESENTATION

Pertussis, or whooping cough, is an acute infectious disease caused by the bacterium *Bordetella pertussis*. Pertussis is an endemic illness in the United States, and epidemics occur every 3-5 years. There is no distinct seasonal pattern, but the disease may increase in the summer and fall, with peaks occurring in 3 to 5 year cycles. The incubation period is commonly 7 to 10 days, with a range of 4 to 21 days, and rarely may be as long as 42 days.

The clinical course is divided into three stages:

1) The first stage, the **catarrhal stage**, lasts about 1-2 weeks and is characterized by the insidious onset of coryza, sneezing, low-grade fever, and a mild intermittent cough. The cough gradually becomes more severe. Fever is generally minimal throughout the course of the disease.

2) Pertussis is usually first suspected during the second stage, the **paroxysmal stage**. This stage is characterized by bursts, or paroxysms, of numerous, rapid coughs, followed by a long inspiratory effort that is accompanied by the characteristic “whoop.” During an episode, the patient may become cyanotic, and the coughing may be followed by vomiting (post-tussive vomiting). Paroxysmal attacks occur more frequently at night, with an average of 15 attacks within 24 hours. During the first 1 or 2 weeks of this stage the paroxysms increase in frequency, remain at the same level for 2 to 3 weeks, and then gradually decrease. The paroxysmal stage usually lasts from 1 to 6 weeks, but may last as long as 10 weeks.

In young children the disease may present with the characteristic “whoop,” paroxysmal coughing, or post-tussive vomiting. It is important to remember that infants less than 6 months old may present with atypical symptoms such as apnea. In addition, older children, immunized individuals, adolescents, and adults may also present atypically and with milder disease. Pertussis may present as a persistent (>7 days) cough, and may be indistinguishable from other upper respiratory infections. Pertussis has been reported to account for as much as 20% of cough illness in older persons.

3) In the **convalescent stage**, recovery is gradual. The cough becomes less paroxysmal and disappears in 2-3 weeks. However, the paroxysms often recur with subsequent respiratory infections for many months after the onset of pertussis.

COMPLICATIONS

Secondary bacterial pneumonia is the most common cause of pertussis-related deaths. Other complications include seizures, encephalopathy, pneumothorax, and otitis media.

TRANSMISSION

Pertussis is highly communicable and the attack rate is between 70% to 100% among susceptible household contacts. Transmission occurs by direct or airborne contact with respiratory droplets, or by direct contact with objects contaminated with respiratory secretions from infectious individuals. The period of communicability is from the onset of symptoms to 21 days after the onset of cough.

TESTING AND DIAGNOSIS

Testing for pertussis is most reliable when performed early in the course of the illness and prior to the initiation of antibiotic treatment. Testing must be done on nasopharyngeal specimens obtained by using Calgiswabs, NOT cotton swabs. A pharyngeal or throat swab is not acceptable for pertussis testing. Please see Attachment 1 for the proper technique for obtaining a nasopharyngeal specimen.

Acceptable diagnostic methods for pertussis include polymerase chain reaction (PCR) and culture. PCR testing of nasopharyngeal aspirates or swabs is a rapid, sensitive, and specific method for diagnosing pertussis. It is available at NYSDOH's Wadsworth Center as well as other approved laboratories. See Attachment 2 for a list of laboratories approved for PCR testing. The current procedure at Wadsworth Center is to perform PCR on all specimens submitted, and to culture only those that are positive by PCR testing.

Culture for *Bordetella pertussis* is performed on special media culture and its fastidious growth requirements make it hard to isolate. Specimens obtained within 3 weeks of cough onset have a higher proportion of culture-positive results. Prior antibiotic treatment or a history of vaccination may interfere with culture growth. Direct fluorescent antibody (DFA) and serology are not reliable testing methods. Neither is recommended for the diagnosis of pertussis.

TREATMENT

Antibiotics given during the catarrhal stage may lessen the severity of the disease and decrease communicability. Treatment after the third week of cough is of questionable benefit. Persons with pertussis are considered non-infectious after having completed 5 days of any of the appropriate antibiotics or if at least 21 days have elapsed since the onset of cough. The macrolide agents erythromycin, clarithromycin, and azithromycin are preferred for the treatment of pertussis in persons aged ≥ 1 month. For infants aged < 1 month, azithromycin is preferred; erythromycin and clarithromycin are not recommended. For treatment of persons aged ≥ 2 months, an alternative agent to macrolides is trimethoprim-sulfamethoxazole (TMP--SMZ).

Recommended antimicrobial treatment and postexposure prophylaxis for pertussis, by age group

Age Group	Primary agents			Alternate agent*
	Azithromycin	Erythromycin	Clarithromycin	TMP-SMZ
<1 month	Recommended agent 10 mg/kg per day in a single dose for 5 days (only limited safety data available.)	Not preferred. Erythromycin is associated with infantile hypertrophic pyloric stenosis. Use if azithromycin is unavailable; 40-50 mg/kg per day in 4 divided doses for 14 days	Not recommended (safety data unavailable)	Contraindicated for infants aged <2 months (risk for kernicterus)
1-5 months	10mg/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 (aged ≥6 months) and children	10 mg/kg in a single dose on day 1 then 5 mg/kg per day (maximum: 500 mg) on days 2-5	40-50 mg/kg per day (maximum 2 g per day) in 4 divided doses for 14 days	15 mg/kg per day in 2 divided doses (maximum: 1 g per day) for 7 days	TMP 8 mg/kg per day, SMZ 40 mg/kg per day in 2 divided doses for 14 days
Adults	500 mg in a single dose on day 1 then 250 mg per day on days 2-5	2 g per day in 4 divided doses for 14 days	1 g per day in 2 divided doses for 7 days	TMP 320 mg per day, SMZ 1,600 mg per day in 2 divided doses for 14 days

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

Reference – CDC. Recommended antimicrobial agents for treatment and post exposure prophylaxis of pertussis: 2005 CDC guidelines. MMWR 2005; 54 (No. RR-14): [page 10].

PROPHYLAXIS OF CONTACTS

Prophylaxis of all household member and other close contacts with antibiotics may prevent or minimize transmission. The same antibiotic regimens and doses described above for treatment are used for prophylaxis. A close contact is defined as direct face-to-face exposure within 3 feet of a symptomatic patient, regardless of the number of hours spent together. Other close contacts are those who attend the same daycare program, pre-K classrooms, or kindergarten classrooms. If the child care center is not separated into classrooms, then the entire child care center should receive prophylaxis. If children are divided into classes, the entire class should receive prophylaxis. Direct contact that occurs with respiratory, oral, or pharyngeal secretions, such as by kissing, sharing lip-gloss or cigarettes, or by sharing drugs, food or utensils, is also considered close contact.

The following groups may need to be handled as close contacts despite a lesser exposure because the risk of severe disease or poor outcome may be higher in these groups or in those to whom these groups may transmit disease:

- Children less than 1 year of age
 - Unvaccinated children less than 7 years of age
 - Immunocompromised individuals
 - Healthcare workers
 - Hospitalized patients
 - Pregnant women
 - Caretakers of infants
 - Person with chronic medical conditions
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- Asymptomatic household and close contacts of a confirmed case whose last exposure was <21 days (in an outbreak setting these interventions may be applied to close contacts of probable cases as well):
 - Should receive appropriate chemoprophylaxis irrespective of their immunization status.
 - Should be observed for respiratory symptoms for 21 days after last exposure.
 - Should have their immunization status reviewed and updated if appropriate.

 - Asymptomatic household and close contacts whose last exposure was >21 days to a confirmed or probable case during their infectious stage (until 21 days after cough onset):
 - Generally, do not need prophylaxis.
 - May benefit from prophylaxis even if exposure occurred up to 42 days before, if they are contacts who are at high risk of severe disease. (e.g., infants and immunocompromised persons).
 - Should have their immunization status reviewed and updated if appropriate.

 - For symptomatic contacts of a confirmed or probable case:
 - Obtain appropriate diagnostic specimen prior to treatment.
 - Report to local health department for assistance with case investigation.

VACCINE

During spring 2005, two tetanus toxoid, reduced diphtheria toxoid and acellular pertussis vaccine (Tdap) products formulated for use in adolescents (and, for one product, use in adults) were licensed in the United States.

- BOOSTRIX®, licensed May 3, 2005, for use in persons aged 10--18 years, and
- ADACEL™ licensed June 10, 2005, for use in persons aged 11--64 years.

The dose of Tdap is 0.5 mL, administered intramuscularly (IM), preferably into the deltoid muscle.

The recommended interval between Td and Tdap for adolescents is 5-10 years. However, during outbreaks or periods of increased pertussis activity in the community, Tdap can be administered at an interval less than 5 years. **The safety of an interval as short as approximately 2 years between Td and Tdap is supported by a Canadian study among children and adolescents.**

INFECTION CONTROL

All healthcare facilities (e.g., hospitals, emergency departments, clinics, doctor's offices) need to re-emphasize the importance of basic infection control measures for the control of respiratory illnesses. All healthcare facilities should implement the Respiratory Hygiene/Cough Etiquette measures outlined in Attachment 3 to help limit transmission of respiratory pathogens in healthcare settings. Patients presenting to emergency departments, clinics and doctor's offices should be triaged to identify those with potential respiratory illnesses so that Respiratory Hygiene/Cough Etiquette may be immediately implemented.

Close contacts in the health care setting include persons with face-to-face contact with a person who is symptomatic (e.g., in the catarrhal or paroxysmal period of the illness); sharing a confined space in close proximity for a prolonged period of time (e.g., ≥ 1 hour) with a symptomatic patient; or direct contact with respiratory, oral, or nasal secretions from a symptomatic patient (e.g., an explosive cough or sneeze in the face, sharing food, sharing eating utensils during a meal, kissing, mouth-to-mouth resuscitation, or performing a full examination of the nose and throat).

Both symptomatic and asymptomatic contacts of healthcare workers and patients with pertussis need to be identified and contacted. All cases and symptomatic contacts of confirmed cases should be excluded from work in a healthcare setting, if it is less than 21 days from the onset of cough and the duration of antibiotic treatment is less than 5 days. Asymptomatic contacts of healthcare workers or patients with pertussis need to be contacted and may need vaccination and prophylaxis according to the criteria above. For hospitalized patients, droplet precautions are needed until 5 days of antibiotic therapy or 21 days after cough onset (if no therapy).

Finally, individuals experiencing coughing illnesses should be encouraged to discontinue regular activities and seek medical care. Examples of these activities include sports and music events, school and work.

REPORTING OF CONFIRMED OR SUSPECT CASES

All suspect, probable, or confirmed pertussis cases need to be reported to the local health department in the county in which the individual resides. The local health department and the NYSDOH Immunization Program can assist in investigating any potential cases of pertussis.

ADDITIONAL INFORMATION

For further information, please call your local health department or the NYSDOH Immunization Program at (518) 473-4437. Additional information can be obtained at the CDC's National Immunization Program website at www.cdc.gov/nip/diseases/pertussis.

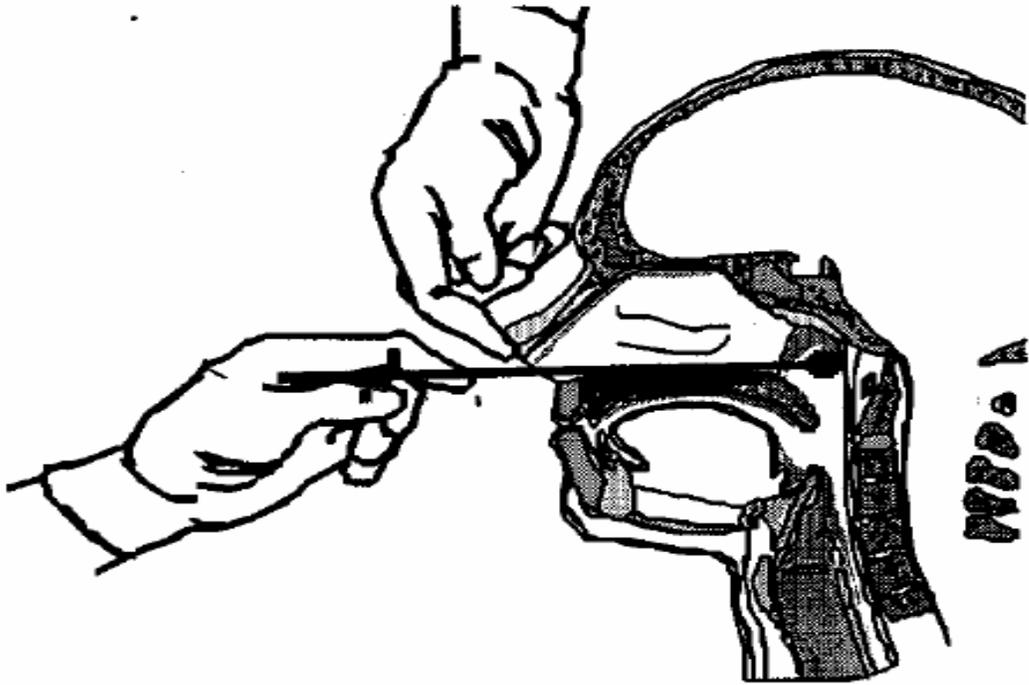
Additional References:

- Centers for Disease Control and Prevention. Guidelines for preventing health-care-associated pneumonia, 2003: recommendations of CDC and the Healthcare Infection Control Practices Advisory Committee. MMWR 2004;53(No. RR-3):[pages1-36].
- Centers for Disease Control and Prevention. Preventing tetanus, diphtheria, and pertussis among adolescents; use of tetanus toxoid, reduced diphtheria toxoid and acellular pertussis

vaccines: recommendations of the Advisory Committee on Immunization Practices (ACIP) MMWR 2006;55(No. RR-3).

- Centers for Disease Control and Prevention. Recommended antimicrobial agents for the treatment and Postexposure prophylaxis of pertussis; 2005 CDC guidelines. MMWR 2005;54(No. RR-14).
- Resources available at www.cdc.gov/nip/publications:
“Guidelines for the Control of Pertussis Outbreaks,” January 2000, updated January 2005
“Surveillance of Vaccine-Preventable Diseases” Manual, 3rd edition, 2002.
“CDC’s Epidemiology and Prevention of Vaccine-Preventable Diseases,” January 2006.
- Resources available at www.cdc.gov/nip/acip:
Provisional recommendations, “Tdap for Adults”, posted March 2006.

Attachment 1



Proper technique for obtaining a nasopharyngeal specimen for isolation of *B. pertussis*

Attachment 2

Laboratories approved for *Pertussis* testing by PCR

(Effective 6/23/06)

PFI	FAC_NAME	FAC_CITY	FAC STATE	Analyte(s)	Specimen Type	Method	Date Approved	Phone Number
7409	Laboratory Alliance of Central New York LLC	Liverpool	NY	Bordetella pertussis detection	NP	Real-time PCR and detection w/TaqMan	1/19/2006	(315) 453-7200
3263	Mayo Clinic Rochester-Department of Laboratory Medicine and Pathology	Rochester	MN	Bordetella pertussis	nasopharyngeal	PCR	9/3/1998	(507) 382-2549
1901	Albany Medical Center Hospital Clinical Microbiology Lab A-22	Albany	NY	Bordetella pertussis detection	NP swabs	PCR	8/17/2005	(518) 262-6172
1067	Wadsworth Center	Albany	NY	Bordetella pertussis	NP swab	PCR	7/11/2003	(518) 474-4417
2006	Kaleida Health Women and Childrens Hospital	Buffalo	NY	Bordetella pertussis	nasopharyngeal aspirates	PCR	1/25/1996	(716) 878-7474
2465	Dept of Pathology Montefiore Med. Ctr Henry & Lucy Moses Division	Bronx	NY	Bordetella pertussis DNA	nasopharyngeal	LightCycler real-time PCR	7/29/2003	(718) 920-4523
4196	ARUP Laboratories	Salt Lake City	UT	Bordetella pertussis/parapertussis	NP swabs, slides, sputum, BAL, NP aspirate, resp. secretion	real-time light cycler PCR	4/16/2003	(801) 583-2787
2478	Quest Diagnostics Incorporated	San Juan Capistrano	CA	Bordetella pertussis and parapertussis DNA detection	NP aspirate, NP swabs	LightCycler PCR	11/13/2003	(949) 728-4000

Attachment 3

FACT SHEET

Respiratory Hygiene/Cough Etiquette in Healthcare Settings

To prevent the transmission of all respiratory infections in healthcare settings, including influenza, the following infection control measures should be implemented at the first point of contact with a potentially infected person. They should be incorporated into infection control practices as one component of Standard Precautions.

1. Visual Alerts

Post visual alerts (in appropriate languages) at the entrance to outpatient facilities (e.g., emergency departments, physician offices, outpatient clinics) instructing patients and persons who accompany them (e.g., family, friends) to inform healthcare personnel of symptoms of a respiratory infection when they first register for care and to practice Respiratory Hygiene/Cough Etiquette.

- *Notice to Patients to Report Flu Symptoms*
(www.cdc.gov/ncidod/dhqp/pdf/Infdis/RespiratoryPoster.pdf)
Emphasizes covering coughs and sneezes and the cleaning of hands
- *Cover Your Cough*
(www.cdc.gov/flu/protect/covercough.htm)
Tips to prevent the spread of germs from coughing
- *Information about Personal Protective Equipment*
(www.cdc.gov/ncidod/dhqp/ppe.html)
Demonstrates the sequences for donning and removing personal protective equipment

2. Respiratory Hygiene/Cough Etiquette

The following measures to contain respiratory secretions are recommended for all individuals with signs and symptoms of a respiratory infection.

- Cover the nose/mouth when coughing or sneezing;
- Use tissues to contain respiratory secretions and dispose of them in the nearest waste receptacle after use;
- Perform hand hygiene (e.g., hand washing with non-antimicrobial soap and water, alcohol-based hand rub, or antiseptic handwash) after having contact with respiratory secretions and contaminated objects/materials.

Healthcare facilities should ensure the availability of materials for adhering to Respiratory Hygiene/Cough Etiquette in waiting areas for patients and visitors.

- Provide tissues and no-touch receptacles for used tissue disposal.
- Provide conveniently located dispensers of alcohol-based hand rub; where sinks are available, ensure that supplies for hand washing (i.e., soap, disposable towels) are consistently available.

3. Masking and Separation of Persons with Respiratory Symptoms

During periods of increased respiratory infection activity in the community (e.g., when there is increased absenteeism in schools and work settings and increased medical office visits by persons complaining of respiratory illness), offer masks to persons who are coughing. Either procedure masks (i.e., with ear loops) or surgical masks (i.e., with ties) may be used to contain respiratory secretions (respirators such as N-95 or above are not necessary for this purpose). When space and chair availability permit, encourage coughing persons to sit at least three feet away from others in common waiting areas. Some facilities may find it logistically easier to institute this recommendation year-round.

4. Droplet Precautions

Advise healthcare personnel to observe Droplet Precautions (i.e., wearing a surgical or procedure mask for close contact), in addition to Standard Precautions, when examining a patient with symptoms of a respiratory infection, particularly if fever is present. These precautions should be maintained until it is determined that the cause of symptoms is not an infectious agent that requires Droplet Precautions www.cdc.gov/ncidod/dhqp/gl_isolation.html.

NOTE: These recommendations are based on the [Draft Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings](#). Recommendations of the Healthcare Infection Control Practices Advisory Committee (HICPAC), CDC