

A Publication of the Genesee County Health Department

Pertussis

Pertussis, also known as whooping cough, is a highly contagious respiratory tract infection caused by the bacterium *Bordetella pertussis*. Transmission from person to person occurs through the respiratory route by direct contact with respiratory secretions or airborne respiratory droplets. Symptoms usually begin 7-10 days after infection. The illness progresses in three clinical stages. Initial symptoms during the catarrhal stage resemble the common cold and include runny nose, sneezing, low-grade fever, and an occasional cough. Communicability is greatest at this stage. The cough progressively worsens and after 1 to 2 weeks the paroxysmal stage begins which is characterized by severe paroxysms of cough. It is in this stage that the disease is most often suspected and some patients produce the high-pitched inspiratory whoop following the paroxysms. Patients may also become cyanotic or experience post-tussive vomiting during this stage. After 1 to 6 weeks the patient enters the convalescent stage and the cough gradually wanes.

In the United States, the number of pertussis cases has been increasing since the 1980s. Until then, incidence had declined steadily due to routine childhood vaccination against the disease. The reason for this recent rise in cases is not completely clear. The increase may be partially due to greater awareness and diagnoses of the disease among adolescents and adults. Approximately 60% of reported pertussis cases are in persons aged 11 years and older¹. Infection with *B. pertussis* in adolescents and adults may range from severe disease to a milder presentation, particularly in those who may have some immunity due to previous vaccination. Communicability to susceptible contacts can still occur regardless of severity of illness, and adolescent and adult household contacts are commonly the source of pertussis transmission to infants too young to be fully vaccinated against the disease. The highest incidence of pertussis is among infants less than 1 year of age¹. Infants are at highest risk of severe complications and death due to the disease. Of the 82 deaths reported in the United States between 2004 and 2006, 69 (84%) were among children 3 months of age or younger¹.

Pertussis is considered endemic in the United States. Between 5,000 to 7,000 cases are reported each year with epidemics occurring every 3-5 years². The last epidemic in the United States occurred in 2005 when 25,615 cases were reported. In January 2009, Michigan Department of Community Health (MDCH) reported a significant increase in pertussis cases during the second half of 2008. Between July 2008 and December 2008 there was a total of 243 cases of pertussis in the State of Michigan compared to 104 cases between January and June of 2008. The total number of reported cases in 2008 was not considerably greater than the number reported in 2007 (292 cases), but of concern was an increase in the number of infants reported with the disease. Genesee County also saw a similar trend among the reported pertussis cases. Although the rate of pertussis in Genesee County has remained unchanged between 2006 and 2008 at 7 cases per year, more cases occurred in the latter half of 2008. Of the cases reported in 2008, 5 (71%) were reported between July and December. The majority of those cases, 4 (80%), were under 1 year of age. Furthermore, 3 of the cases were infants under 3 months of age who were too young to be fully vaccinated against the disease. The other infant was eligible for vaccination but was not properly immunized. The increase in pertussis incidence for the State of Michigan and Genesee County has continued into 2009.

Pertussis is a notifiable disease in the United States. Health care providers must immediately report pertussis cases to their local health department. Local health departments can help health care providers in determining if a patient meets the national surveillance case definition for pertussis and to coordinate specimen testing if a public health laboratory is used. Local health departments also conduct an investigation of each case. The investigation includes collecting epidemiological and clinical information, interviewing case patients or guardians to identify sources of infection, and ensuring

The purpose of this newsletter is to inform the community and health care providers in Genesee County about disease trends in the county. We welcome any comments or questions. Contact Fatema Mamou, MPH, Epidemiologist, at (810) 768-7971 or email fmamou@gchd.us

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proper chemoprophylaxis and/or vaccination of contacts. Providers should inform patients that the health department will be contacting them.

Clinicians should consider pertussis in prolonged cough illness lasting at least 2 weeks. Laboratory confirmation for pertussis should be performed on all suspected cases. Health care providers should obtain a nasopharyngeal (NP) swab (Dacron) or aspirate from the posterior nasopharynx for culture and PCR analysis. Isolation of *B. pertussis* by culture is the gold standard for diagnosis but has low sensitivity. As a result, the Centers for Disease Control and Prevention (CDC) recommend that, in addition to culture, the specimen be submitted for PCR testing. Other testing methods including direct fluorescent antibody (DFA) testing and serologic testing are not recommended and are not confirmatory tests for pertussis. DFA testing of nasopharyngeal specimens may be useful as a rapid screening test for pertussis but should be used alongside culture and PCR tests.

The CDC recommends treatment of pertussis with macrolide antibiotics within 3 weeks of cough onset for persons >1 year and within 6 weeks of cough onset for infants aged <1 year³. Antibiotic treatment reduces the period of communicability and is essential for disease control. Antibiotic prophylaxis should be given to all household and close contacts within 3 weeks of exposure regardless of age or vaccination status. The treatment and prophylaxis regimens are the same. Three macrolides are recommended for persons one month of age and older and include Azithromycin one time daily for 5 days, clarithromycin 2 times

daily for 7 days, or erythromycin 4 times daily for 14 days. A 14 day course of TMP-SMZ may be used as an alternative in patients ≥ 2 months of age.

Azithromycin is the recommended antibiotic for infants less than one month of age. Initiation of treatment and prophylaxis can precede laboratory confirmation when pertussis is strongly suspected. Because infants are at risk for disease, infants and their household contacts should be given prophylaxis even when suspicion is low³.

Vaccination can prevent pertussis. The vaccines for pertussis in the United States are inactivated and contain acellular pertussis antigens in combination with diphtheria and tetanus toxoids. Infants and children are recommended to receive a four dose primary series of DTaP given at 2, 4, 6, and 15-18 months of age. A fifth booster dose of DTaP is given at 4-6 years of age. Because immunity wanes over time, it is recommended that adolescents and adults aged 11 to 64 years of age receive a single booster dose of Tdap. This dose should replace one booster dose of Td. It is very important that adolescents and adults in close contact with young infants be vaccinated with Tdap. Women should receive Tdap before becoming pregnant. Pregnant women who are not fully vaccinated against pertussis should be educated about the benefits of Tdap and receive the vaccine in the immediate postpartum period.

¹Centers for Disease Control and Prevention. Epidemiology and Prevention of Vaccine-Preventable Diseases. 11th ed. Public Health Foundation, Washington DC, 2009

²Centers for Disease Control and Prevention, National Center for Immunization and Respiratory Diseases: Division of Bacterial Diseases (2009) "Pertussis" Retrieved July 28, 2009 from http://www.cdc.gov/ncidod/dbmd/diseaseinfo/pertussis_t.htm

³Centers for Disease Control and Prevention. Manual for the surveillance of vaccine-preventable diseases. Centers for Disease Control and Prevention, Atlanta, GA, 2008.

Selected Reportable Communicable Diseases in Genesee County

Disease	Reported cases in the week ending 7/25/2009	Reported cases in previous week, ending 7/18/2009	Reported cases to date this FY* 2008-2009	Reported cases to date last FY 2007- 2008	Total reported cases last FY 2007-2008
Chickenpox	2	1	86	122	126
Pertussis	0	1	8	4	7
Tuberculosis	0	0	3	2	2
Flu-like illness	0	1	13,858	16,565	46,373
Influenza A, Novel H1N1	0	0	14	0	0
Chlamydia	59	49	2,414	2,330	2,868
Gonorrhea	22	21	926	1,136	1,366
HIV, Adult	2	0	33	42	51
Infectious Syphilis, Adult	0	1	60	83	113
Hepatitis B, Acute	0	0	11	8	11
Hepatitis C, Chronic	5	6	341	303	366
Campylobacter	3	0	3	12	26
Giardiasis	2	2	21	11	16
Hepatitis A	0	0	3	7	7
Salmonellosis	1	0	21	31	36
Meningitis-Viral	1	5	46	36	55
Meningococcal Disease	0	0	2	2	2

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*FY – Fiscal Year, October 1-September 30