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# CDC HEALTH ADVISORY

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## Multi-state Mumps Outbreak

The state of Iowa has been experiencing a large outbreak of mumps that began in December 2005 (1). As of April 12, 2006, 605 suspect, probable and confirmed cases have been reported to the Iowa Department of Public Health (IDPH) (IDPH, unpublished data). The majority of cases are occurring among persons 18-25 years of age, many of whom are vaccinated. Additional cases of mumps, possibly linked to the Iowa outbreak, are also under investigation in eight neighboring states, including Illinois, Indiana, Kansas, Michigan, Minnesota, Missouri, Nebraska, and Wisconsin (CDC unpublished data, April 14, 2006).

In addition, the Iowa Department of Public Health has identified two persons diagnosed with mumps who were potentially infectious during travel on nine different commercial flights involving two airlines between March 26, 2006 and April 2, 2006. The origin and arrival cities for these flights include Cedar Rapids and Waterloo, IA; Dallas, TX; Detroit, MI; Lafayette, AR; Minneapolis, MN; St. Louis, MO; Tucson, AZ; and Washington, D.C. (2).

The source of the current US outbreak is unknown. However the mumps strain has been identified as genotype G, the same genotype circulating in the United Kingdom (UK). The outbreak in the UK has been ongoing from 2004 to 2006 and has involved > 70,000 cases. Most UK cases have occurred among unvaccinated young adults (3). The G genotype is not an unusual or rare genotype and, like the rest of known genotypes of mumps, it has been circulating globally for decades or longer.

*Mumps clinical manifestations and transmission*

Mumps is an acute viral infection characterized by a non-specific prodrome including myalgia, anorexia, malaise, headache and fever, followed by acute onset of unilateral or bilateral tender swelling of parotid or other salivary glands (4). In unvaccinated populations, an estimated 30-70% of mumps infections are associated with typical acute parotitis (4, 5). However, as many as 20% of infections are asymptomatic and nearly 50% are associated with non-specific or primarily respiratory symptoms, with or without parotitis (4).

Complications of mumps infection can include deafness, orchitis, oophoritis, or mastitis (inflammation of the testicles, ovaries, or breasts respectively), pancreatitis, meningitis/encephalitis, and spontaneous abortion. With the exception of deafness, these complications are more common among adults than children (4).

Transmission of mumps virus occurs by direct contact with respiratory droplets, saliva or contact with contaminated fomites. The incubation period is generally 16-18 days (range 12-25 days) from exposure to onset of symptoms (4, 6). Mumps virus has been isolated from saliva from between two and seven days before symptom onset until nine days after onset of symptoms (4, 6).

*Mumps Prevention*

The principal strategy to prevent mumps is to achieve and maintain high immunization levels. The Advisory Committee on Immunization Practices (ACIP) recommends that all preschool aged children 12 months of age and older receive one dose of measles-mumps-rubella vaccine (MMR) and all school-aged children receive two doses of MMR, and to ensure that all adults have evidence of immunity against mumps (5). As noted below, two doses of mumps vaccine are more effective than a single dose. Consequently, during outbreaks and for at-risk populations, ensuring high vaccination coverage with two doses is encouraged. For example, health care workers may be at increased risk of acquiring mumps and transmitting to patients and thus should receive two doses of MMR vaccine or provide proof of immunity. Since vaccination is the cornerstone of mumps prevention, public and private health entities concerned about spread of mumps in a population can review the vaccination status of populations of interest and work to address gaps in vaccination.

*Mumps Vaccine Effectiveness*

Data from outbreak investigations have shown that the effectiveness of MMR against mumps is approximately 80% after one dose and limited data suggest effectiveness of approximately 90% after two doses. Available evidence suggests that mumps vaccination should provide immunity against the genotype G virus responsible for the current US outbreak. A study of a 2005 New York outbreak that began with imported disease from the UK (7), demonstrated vaccine effectiveness in the expected range for both one and two doses (New York, unpublished data). However, since the vaccine is not 100% effective, some cases can occur in vaccinated persons. When a highly-vaccinated population is exposed to disease, most cases of disease would be expected to be among vaccinated persons. Mumps vaccine has not been shown to be effective in post-exposure prophylaxis and an interval of 2-4 weeks after vaccination may be required for the vaccine's full immunogenicity to be achieved. For these reasons, and because of the mumps' incubation period of 12-25 days, during an outbreak, newly-vaccinated persons may develop mumps disease as long as a month after vaccination (4, 5).

*Control of mumps outbreaks*

The main strategies for controlling a mumps outbreak are to define the at-risk population and transmission setting, identify and isolate suspected cases, and to rapidly identify and vaccinate susceptible persons or, if a contraindication to MMR vaccine exists, to exclude susceptible persons from the setting to prevent exposure and transmission. Specific strategies are listed below.

1. Offer MMR vaccine to persons without evidence of immunity. Evidence of immunity includes physician diagnosis or laboratory evidence of mumps infection, birth before 1957 or one dose of MMR vaccine. For pre-school aged children, the first MMR dose should be administered as close to age 12 months as possible. Although birth before 1957 is usually considered proof of immunity, during an outbreak, vaccination can be considered for this age group if the epidemiology of the outbreak suggests that they are at increased risk of disease. Since two doses of MMR vaccine is more effective than one dose for preventing mumps, a second dose of MMR vaccine is recommended for the following groups: health care workers, school-aged children, students at post-high school educational institutions and other age groups considered at high risk of exposure (5, 8).

2. Surveillance for mumps should be enhanced in all affected areas for persons with parotitis or other salivary gland inflammation. Enhanced surveillance should continue for 50 days (two times the maximum

incubation period) after the date of illness onset in the last identified case. CSTE approved case definitions and case classifications for mumps are available (5).

3. Persons with suspected mumps should be tested and reported immediately to local public health officials. Information on collection and testing of clinical specimens for mumps will be available by Monday April 17, 2006 at http://www.cdc.gov/nip/diseases/mumps/mumps-lab.htm. Testing is essential as not all cases of parotitis are mumps, although mumps is the only known cause of epidemic parotitis.

4. Persons suspected of having mumps should be isolated for nine days after symptom onset (5, 6). In health care settings, the use of respiratory precautions is recommended (5).

5. Exclusion of persons without evidence of immunity to mumps from institutions such as schools and colleges affected by a mumps outbreak (and other, unaffected institutions judged by local public health authorities to be at risk for transmission of disease) should be considered. Once vaccinated, students can be readmitted to school. The period of exclusion for those that remain unvaccinated should be for at least 25 days after the onset of parotitis in the last person with mumps in the affected institution (5, 6).

Additional information on mumps and the prevention and control of mumps outbreaks, including vaccination, can be found at the following website:

**http://www.cdc.gov/nip/diseases/mumps/mumps-outbreak.htm**.

*References*


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