Health Advisory:

Mumps Cases in Central Missouri

November 18, 2016

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FROM: **PETER LYSKOWSKI, DIRECTOR**

SUBJECT: **Mumps Cases in Central Missouri**

The Columbia/Boone County Department of Public Health and Human Services and the Missouri Department of Health and Senior Services (DHSS) continue to receive reports of mumps cases among persons associated with a large university located in central Missouri. A total of 73 (31 laboratory-confirmed and 42 probable) cases of mumps have been reported as of November 18, 2016. Most cases report a symptom onset after October 27, 2016. The purpose of this DHSS Health Advisory is to alert health care providers of the outbreak of mumps among Missouri college students, and to provide guidance on clinical and laboratory diagnosis, and measures to control infection transmission.

Background

Mumps is an acute viral infection caused by the mumps virus, a member of the family *Paramyxoviridae*. Infection transmission occurs from person to person through direct contact with respiratory secretions or saliva or indirect contact through fomites. The average incubation period for mumps is 16 to 18 days, with a range of 12 to 25 days. The mumps virus has been isolated from 7 days before through 9 days after parotitis onset; however, the maximum infectiousness occurs in the 2 days before through 5 days after parotitis onset. Transmission also likely occurs from persons with asymptomatic infections and from persons with prodromal symptoms in the absence of parotitis.

The symptoms of mumps typically begin with body aches, loss of appetite, fatigue, headache, and low grade fever, and can progresses to parotitis. Parotid swelling is unilateral initially, but later becomes bilateral in the majority of cases. Earache on the side of parotitis and discomfort with eating acidic foods are common. Other salivary glands (submandibular and sublingual) under the floor of the mouth also may swell but do so less frequently. Fever usually resolves within 3 to 5 days, and parotid swelling resolves within 7 to 10 days. Morbilliform rash has been reported in mumps cases. Increased serum amylase levels can be observed during the first week of illness. One-third of mumps cases have subclinical infection or mild respiratory illness. Adolescents and adults have more severe illness than young children.

Most persons with mumps will recover completely though serious complications can occur. Complications include orchitis (testicular inflammation in males), aseptic meningitis, and rarely encephalitis, pancreatitis, deafness, and death. Mumps virus is neurotropic, but only a small fraction of cases with mumps parotitis have clinical evidence of meningitis or encephalitis. Parotitis does not develop in about half of patients with mumps meningitis. Mumps orchitis is usually unilateral, and more common in those 15 to 29 years of age. Complications of mumps infection reported in recent U.S. mumps outbreaks include: orchitis in 3.3 to 10% of adolescent and adult male cases, which may result in sterility; mastitis and oophoritis in < 1% of adolescent and adult female cases; and other rare complications in < 1% of cases. Vaccination

with the measles-mumps-rubella (MMR) and measles-mumps-rubella-varicella (MMRV) vaccines is the best way to prevent mumps. Since introduction of the vaccine, there has been a 99% decrease in mumps cases in the U.S. Two doses of the vaccine has a median 88% (range: 66% to 95%) effectiveness in protecting against mumps, while one dose is 78% (range: 49% to 92%) effective. Outbreaks can still occur in highly vaccinated U.S. communities, particularly in close-contact settings, such as attending the same class, playing on the same sports team, or living in a dormitory with a person who has mumps. In recent years, outbreaks have occurred in schools, colleges, and camps. However, high vaccination coverage helps limit the size, duration, and spread of mumps outbreaks. Persons who received 2 doses of MMR are about 9 times less likely to get mumps than unvaccinated persons who have the same exposure. If mumps infection is acquired by the vaccinated person, the disease is usually less severe, and has less complications.

Laboratory Testing

Laboratory testing should be performed if mumps is suspected. Acute mumps infection can be detected by the presence of mumps IgM in serum, a significant rise in IgG antibody titer in acute and convalescent-phase serum specimens, IgG seroconversion, positive mumps virus culture, or detection of the virus by real-time reverse transcription polymerase chain reaction (RT-PCR). Specimen collection should include a buccal or oral swab specimen in viral transport for molecular detection by RT-PCR and viral culture; **AND** blood specimens for serologic testing. The early collection of buccal swab specimens provides the best means of laboratory confirmation, particularly among suspected mumps patients with a history of vaccination. The first (acute-phase) serum sample should be collected as soon as possible upon suspicion of mumps disease. Collect 7–10 ml of blood in a red-top or serum-separator tube (SST). Convalescent-phase serum samples should be collected about 2–3 weeks after the acute-phase sample.

Please note: Laboratory testing to confirm mumps in a highly vaccinated population may be challenging, and serologic tests should be interpreted with caution as **false negative** serologic results in vaccinated persons are common. In previously vaccinated persons (particularly with 2 vaccine doses), serum mumps IgM tests results may be negative; IgG test results may be positive at the initial blood draw; and viral detection in RT-PCR or culture may have low yield if the buccal swab is collected more than 3 days after parotitis onset. Also, **false positive** IgM serology results can occur in both unvaccinated and vaccinated persons because assays may be affected by other diagnostic entities that cause parotitis.

The Missouri State Public Health Laboratory (MSPHL) provides laboratory support for the diagnosis of mumps infections occurring in Missouri. In addition, the laboratory may refer specimens to a Vaccine Preventable Disease (VPD) reference laboratory for further diagnostic testing and characterization. VPD laboratories are established in cooperation with public health laboratories and the Centers for Disease Control and Prevention (CDC) to provide reference testing and surge capacity.

Medical providers caring for a patient suspected of having mumps should contact their local public health agency (LPHA), or DHSS at 573/751-6113 or 800/392-0272 (24/7), to report the illness and discuss testing eligibility and the sending of specimens to MSPHL. **Note:** before any specimen is sent to MSPHL, DHSS must first be consulted for approval for testing as resources are limited. Information regarding mumps testing at the MSPHL is located at: http://health.mo.gov/lab/mumps.php. For additional information on laboratory testing for mumps, see: CDC Laboratory Testing for Mumps: http://www.cdc.gov/mumps/lab/index.html; CDC Questions and Answers about Lab Testing for Mumps: http://www.cdc.gov/mumps/lab/qa-lab-test-infect.html; CDC Specimen Collection, Storage, and Shipment: http://www.cdc.gov/mumps/lab/specimen-collect.html (do **NOT** ship specimens directly to CDC).

Controlling Transmission:

Health-care providers should maintain a high index of suspicion for mumps among persons with

symptoms compatible with the disease. In addition, be aware that mumps outbreaks can occur in highly vaccinated populations in high transmission settings, including schools and colleges. Therefore, mumps should not be ruled out based on evidence of mumps immunity. Promptly report suspected cases of mumps to your LPHA, or to DHSS at 573/751-6113 or 800/392-0272 (24/7).

CDC infection control recommendations for known or suspected mumps cases include: 1) isolation of persons in the community and 2) use of droplet precautions, in addition to standard precautions, in healthcare settings. These measures should be continued for 5 days after onset of parotitis. Persons who were contacts of a mumps case during the 2 days prior through 5 days after onset of parotitis should be identified, assessed for evidence of immunity (see http://www.cdc.gov/mmwr/preview/mmwrhtml/rr6204a1.htm, Table 3), and offered vaccine as appropriate. In addition, all contacts should be educated on the symptoms of mumps, instructed to watch for symptoms from 12 to 25 days after the last exposure, and told to isolate themselves and contact their medical provider and their local health department if symptoms develop.

Mumps-containing vaccine should be administered as appropriate to persons without evidence of immunity (see http://www.cdc.gov/mmwr/preview/mmwrhtml/rr6204a1.htm, Table 3). Although mumps-containing vaccination has not been shown to be effective in preventing mumps in persons already exposed to mumps virus, it will prevent infection in those persons who are not yet exposed or infected. If a person without evidence of immunity can be vaccinated early in the course of an outbreak, they can be protected prior to exposure. Given the long incubation period for mumps, cases can be expected to potentially occur for at least 25 days among newly vaccinated persons who may have been infected prior to vaccination. Immunization of infected persons during the incubation period presents no increased risk of adverse events.

Prevention and control strategies should be applied in all health care settings. These measures include: assessment of the presumptive immunity of healthcare personnel; vaccination of those without evidence of immunity when appropriate; exclusion of health care personnel with known or suspected active mumps illness, as well as health care personnel who do not have presumptive evidence of immunity who are exposed to persons with mumps; and isolation of patients in whom mumps is suspected, including implementation of droplet precautions in additional to standard precautions. It is very important to avoid sharing drinks or eating utensils, especially in high risk settings for disease transmission such as households, college campuses, and sport teams.

Guidance on mumps vaccination, including determining presumptive immunity among health care workers, is available at http://www.cdc.gov/mmwr/preview/mmwrhtml/rr6204a1.htm.

Questions should be directed to DHSS' Bureau of Communicable Disease Control and Prevention at 573/751-6113 or 800/392-0272 (24/7).

Additional Guidance

CDC Mumps for Healthcare Providers:
http://www.cdc.gov/mumps/hcp.html

Prevention of Measles, Rubella, Congenital Rubella Syndrome, and Mumps, 2013: Summary Recommendations of the Advisory Committee on Immunization Practices (ACIP):
http://www.cdc.gov/mmwr/preview/mmwrhtml/rr6204a1.htm

CDC Manual for Vaccine Preventable Diseases:
http://www.cdc.gov/vaccines/pubs/surv-manual/chpt09-mumps.html