

# MUMPS

**Also known as: Infectious Parotitis**

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## **Responsibilities:**

**Hospital:** Report by IDSS, facsimile, phone or mail

**Lab:** Report by IDSS, facsimile, phone or mail

**Physician:** Report by facsimile, phone or mail

**Local Public Health Agency (LPHA):** Report by IDSS, facsimile, phone or mail.

**Iowa Department of Public Health**

**Disease Reporting Hotline: (800) 362-2736**

**Secure Fax: (515) 281-5698**

## **1) THE DISEASE AND ITS EPIDEMIOLOGY**

### **A. Etiologic Agent**

Mumps is caused by the mumps virus (genus *Paramyxovirus*, family *Paramyxoviridae*).

### **B. Clinical Description**

Mumps is a systemic disease characterized by swelling of the salivary glands, which usually lasts several days. However, about one-third of infections do not cause clinically apparent salivary gland swelling. Respiratory symptoms are common. Encephalitis occurs rarely, and permanent sequelae or death is uncommon. Infection in adulthood is likely to produce a more severe disease, including mastitis, which occurs in up to 31% of females aged > 15 years, and orchitis, which occurs in 20% – 30% of post-pubertal males. Other rare complications include arthritis, renal involvement, myocarditis, cerebellar ataxia, pancreatitis, and hearing impairment. Mumps infection during the first trimester of pregnancy can increase the risk of spontaneous abortion, although no evidence exists that it causes congenital malformations. While death due to mumps is rare, more than half the fatalities occur in those  $\geq 19$  years of age.

Mumps should not be ruled out in someone who is vaccinated if he or she has clinically consistent symptoms.

*Note:* Swelling of the salivary glands can also be caused by infection with cytomegalovirus, parainfluenza virus types 1 and 3, influenza A, Coxsackie A, echovirus, lymphocytic choriomeningitis virus, HIV, and non-infectious causes such as drugs, tumors, immunologic diseases, and obstruction of the salivary duct.

### **C. Reservoirs**

Humans are the only known reservoirs.

### **D. Modes of Transmission**

Mumps is transmitted by droplet or direct contact with nasopharyngeal secretions of an infected person, and by the airborne route.

### **E. Incubation Period**

The incubation period is usually 16 – 18 days, with a range of 12 – 25 days

### **F. Period of Communicability or Infectious Period**

Virus has been isolated from saliva (from 7 days before the onset of parotitis to 9 days afterwards) and from urine (six days prior to fifteen days after). Infectiousness occurs between 3 days before

symptom onset until four days after or until symptoms resolve. Unapparent infections can be communicable.

## **G. Epidemiology**

Mumps occurs worldwide. In the United States, it is endemic year-round, historically peaking in winter and spring; however seasonality no longer is evident, due to widespread immunization. Eighty-five percent of adults have serologic evidence of immunity. About one-third of the infections do not cause apparent parotitis but those infected can still transmit disease; most infections in children < 2 years of age are subclinical. The incidence of mumps in the U.S. has declined since the vaccine came into use in 1967. In 1986 and 1987, there was a relative resurgence of mumps, apparently due to the absence of comprehensive state immunization requirements as well as, in some instances, vaccine failure. The number of mumps cases reported in the U.S. declined steadily from 1989 to 2005, but a multi-state outbreak of Mumps in 2006 resulted in over 6000 reported cases, including almost 2000 cases in Iowa. Outbreaks in highly vaccinated populations still occur, probably due to vaccine mismanagement or vaccine failure.

## **H. Bioterrorism Potential**

None

## **2) REPORTING CRITERIA AND LABORATORY TESTING SERVICES**

Iowa Administrative Code 641-1.3(139) stipulates that the laboratory and the healthcare provider report. The reporting number for IDPH Center for Acute Disease Epidemiology (CADE) is (800) 362-2736. After completing the investigation and gathering the information to complete the investigation form, enter information into the Iowa Disease Surveillance System (IDSS), or FAX the report form with supporting laboratory documentation to (515) 281-5698 or mail (in an envelope marked "Confidential") to the IDPH/CADE, mailing address:

IDPH, CADE  
Lucas State Office Building, 5<sup>th</sup> Floor  
321 E. 12<sup>th</sup> St.  
Des Moines, IA 50319-0075

Postage-paid disease reporting forms are available free of charge from the IDPH clearinghouse. Call (319) 398-5133 or visit the website: [healthclearinghouse.drugfreeinfo.org/cart.php?target=category&category\\_id=295](http://healthclearinghouse.drugfreeinfo.org/cart.php?target=category&category_id=295) to request a supply.

### **A. What to Report to the Iowa Department of Public Health**

- A suspect or confirmed case of mumps, as diagnosed by a healthcare professional, or
- Isolation of mumps virus from clinical specimen, or
- Significant rise between acute and convalescent phase titers in serum mumps IgG antibody level by any standard serologic assay, or
- Positive serologic test for mumps IgM antibody.

### **B. Laboratory Testing Services Available**

- Laboratory tests should be conducted on anyone with symptoms compatible with mumps without other apparent cause, regardless of vaccination history.
- All specimens described below should be obtained for all patients with suspected mumps.

**1) Testing for Mumps Virus:** The specimen should reflect the pathology of disease. Specimens sent to the University of Iowa State Hygienic Lab (SHL) should be submitted with a completed SHL "Viral Test" request form. Test request forms and specimen collection and shipment instructions can be found at the SHL web site at [www.shl.uiowa.edu/kitsquotesforms/](http://www.shl.uiowa.edu/kitsquotesforms/). Unlabeled specimens will not be tested.

Parotid gland duct swab for polymerase chain reaction testing (in M4 viral transport medium) may be collected from date of onset of symptoms to 9 days after onset of symptoms. Massage the parotid (salivary) glands for 30 seconds prior to swabbing the buccal cavity (the space near the upper rear molars between the cheek and the teeth). Place swab into M4 Viral Transport Medium and do not remove swab. Specimen must be stored and shipped cold (on ice packs). Laboratories have M4 transport tubes available in the SHL Biodefense kits (blue box), herpes kits, and virus isolation kits.

- 2) Serologic Testing:** collect 7-10 ml blood in a red top or serum separator tube (SST) with a completed SHL Serology Test Request form and ship either **a)** with culture specimens cold (on ice packs) or, **b)** at ambient temperature. Test request forms and instructions for collection and shipment of specimens can be found at the SHL web site at [www.shl.uiowa.edu/kitsquotesforms/](http://www.shl.uiowa.edu/kitsquotesforms/). Serum for mumps virus IgM should be collected 3 to 5 days after symptom onset. Mumps virus IgM peaks at 1 – 2 weeks after symptom onset.

**Contact SHL at (319) 335-4500 to request test kits,** specimen collection instructions, test request forms, and shipping instructions or visit [www.shl.uiowa.edu](http://www.shl.uiowa.edu)

### **3) DISEASE REPORTING AND CASE INVESTIGATION**

#### **A. Purpose of Surveillance and Reporting**

- To identify cases and susceptible exposed people rapidly and to prevent further spread of the disease.
- To confirm mumps infection as the cause of glandular swelling/pain.
- To distinguish between failure to vaccinate and vaccine failure and development of a plan to address the problems.

#### **B. Initial Questions to Ask Healthcare Provider and Patient**

To assess the likelihood that a suspect case is a true case prior to laboratory testing, LPHA and/or other public health staff helping in the investigation should ask about: 1) symptoms, 2) mumps immunization history, 3) recent history of dental work, 4) recent history of travel (to where and dates), 5) whether there were any recent out-of-town visitors (from where and dates), and 6) whether there was any recent contact with anyone with similar symptoms.

### **4) CONTROLLING FURTHER SPREAD**

This section provides detailed control guidelines that are an integral part of case investigation.

#### **A. Minimum Period of Isolation of Patient**

Exclude patients from school or work for 5 days after onset of illness (this includes the first day of illness)

#### **B. Protection of Contacts of a Case (includes outbreak situations)**

Identify and immunize susceptible people within the same community. Susceptible persons are defined as those who have not had two MMRs or MMRVs. Note: mumps (MMR or MMRV) vaccination will not prevent infection in a person who has been recently exposed, but vaccinating may prevent future outbreaks.

- **Case:** Exclude from work or school for 5 days after onset of symptoms (this includes the first day of illness). The suspect case may return to normal activities on the 6th day or once symptoms have resolved, whichever is later.
- **Contacts:** All contacts should be evaluated for vaccination status. If a person does not have 2 doses, refer for vaccination. If person has a contraindication or refuses vaccination, educate on personal protective measures and symptoms of mumps. Contacts may continue normal activities in the absence of symptoms. Note: mumps (MMR or MMRV) vaccination will not prevent infection in a person who has been recently exposed, but vaccinating may prevent future outbreaks.

1. Conduct active surveillance for mumps for 2 incubation periods (50 days) after onset of the last case.
2. Mumps vaccine, preferably MMR or MMRV, should be administered to all susceptible persons. As with any vaccine, there will be some individuals who will not gain immunity after the receipt of the mumps vaccine. Because effectiveness is not 100%, a second dose of mumps-containing vaccine is recommended for individuals who have previously received only one dose. Furthermore, birth before 1957 does not guarantee mumps immunity; mumps vaccine should be considered for those born before 1957, especially in outbreak situations.

### **C. Managing Mumps in Healthcare Settings**

1. Proof of immunity: Birth in the U.S. before 1957 does not guarantee mumps immunity. Therefore, all healthcare workers should have documentation of at least one dose, preferably two doses, of mumps-containing vaccine on or after the first birthday or serologic proof of immunity. An effective routine MMR or MMRV vaccination program for healthcare workers (in addition to standard precautions) is the best approach to prevent nosocomial transmission.
2. Isolation of patients:
  - Patients should be placed on Droplet Precautions for the duration of their hospitalization. Unusual circumstances may need consultation with the Iowa Department of Public Health.
  - Exposed susceptible patients should be placed on Droplet Precautions from the 12<sup>th</sup> day after the earliest exposure through the 26<sup>th</sup> day after the last exposure. They may be taken off precautions on the 27<sup>th</sup> day.
3. Exclusion of staff:
  - Personnel who become sick should be excluded from work at least 5 days after the onset of symptoms (this includes the first day of illness) or until symptoms resolve, whichever is later. These staff should be excluded from high-risk (i.e. patient's requiring a protective environment such as cancer unit, burn unit, bone marrow recipients, special-care nursery) patient contact at least 9 days after the onset of symptoms (counting the day of symptom onset as day zero) or until symptoms resolve, whichever is later.
  - Personnel who have been exposed to a mumps case and are susceptible (have no serological evidence of immunity) should be vaccinated and should remain home from the 12<sup>th</sup> day after the 1<sup>st</sup> exposure through the 26<sup>th</sup> day after their last exposure. Consult with IDPH for special situations.  
Note: All new staff should be assessed for mumps immunity.
4. Surveillance: Conduct active surveillance for mumps for 2 incubation periods (50 days) after onset of the last case.

### **D. Preventive Measures**

#### **Personal Preventive Measures/Education**

Vaccination with MMR or MMRV of all susceptibles is the best preventive measure against mumps. Susceptibles are defined as anyone who has not had 2 doses of MMR or MMRV. Good personal hygiene (which consists of proper hand hygiene, disposal of used tissues, not sharing eating utensils, etc.) is also important. For more information on the measles, mumps and rubella vaccine, see the ACIP vaccine information statement.

### **Additional Information**

The Council of State and Territorial Epidemiologists (CSTE) surveillance case definitions for Mumps can be found at: [www.cdc.gov/osels/ph\\_surveillance/nndss/phs/infdis.htm#top](http://www.cdc.gov/osels/ph_surveillance/nndss/phs/infdis.htm#top)

CSTE case definitions should not affect the investigation or reporting of a case that fulfills the criteria in this chapter. (CSTE case definitions are used by the state health department and the CDC to maintain uniform standards for national reporting.)

## References

- American Academy of Pediatrics. *Red Book 2003: Report of the Committee on Infectious Diseases, 26<sup>th</sup> Edition*. Illinois, American Academy of Pediatrics, 2003.
- CDC. Vaccination of health care workers: [www.cdc.gov/vaccines/adults/rec-vac/hcw.html](http://www.cdc.gov/vaccines/adults/rec-vac/hcw.html)
- CDC. Updated Recommendations for the Isolation of Persons with Mumps. *MMWR*. 2008, 57(40); 1103-1105
- CDC. *Manual for the Surveillance of Vaccine-Preventable Diseases*, CDC, 2002.
- CDC. Measles, Mumps, and Rubella—Vaccine Use and Strategies for Elimination of Measles, Rubella, and Congenital Rubella Syndrome and Control of Mumps. Recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR*. 1998, 47:RR-8.
- Heymann, D.J., ed. *Control of Communicable Diseases Manual, 20<sup>th</sup> Edition*. Washington, DC, American Public Health Association, 2015.
- CDC. *Epidemiology and Prevention of Vaccine-Preventable Diseases*. Tenth Edition. March, 2008.