

Mumps

Summary

Mumps is an acute viral disease characterized by fever and swelling of one or more of the salivary glands (usually the parotid gland in 30% to 40% of infected persons) or reproductive glands. Mumps typically occurs in childhood. Infection among adults is more likely to be severe. Diagnosis is made clinically and confirmed using serology or culture. Treatment is supportive.

Agent

Mumps virus is an RNA virus of the genus Rubulavirus in the Paramyxovirus family.

Transmission

Reservoir:

Humans.

Mode of transmission:

Airborne transmission or droplet spread and by direct contact with the saliva of an infected person.

Period of communicability:

From 7 days prior to onset of parotitis to 5 days after onset of gland swelling. Patients are most infectious from 1-2 days before to 5 days after onset of gland swelling.

Clinical Disease

Incubation period:

The incubation period of mumps is 16 to 18 days (range is 12 to 25 days).

Illness:

Acute onset of mild to moderate tender swelling of one or more salivary glands, usually the parotid. As many as 30% of mumps infections are asymptomatic or present as respiratory tract infection. Central nervous system (CNS) involvement in the form of aseptic meningitis (inflammatory cells in cerebrospinal fluid) is common. Symptomatic meningitis (e.g., headache, stiff neck) occurs in less than 10% of patients and resolves without sequelae in 3 to 10 days. Adults are at higher risk for this complication than children, and boys are more commonly affected than girls (3:1 ratio). Parotitis may be absent in as many as 50% of such patients. Encephalitis is rare (less than 2 per 100,000 mumps cases).

Orchitis, testicular inflammation, is the most common complication in post pubertal males. It occurs in as many as 50% of post pubertal males, usually after parotitis, but it may precede it, begin simultaneously, or occur alone. It is bilateral in approximately 30% of affected males. There is usually abrupt onset of testicular swelling, tenderness, nausea, vomiting, and fever. Pain and swelling may subside in one week, but tenderness may last for weeks. Approximately 50% of patients with orchitis have some degree of testicular atrophy, but sterility is rare.

Oophoritis, ovarian inflammation, occurs in 5% of post-pubertal females. It may mimic appendicitis. There is no relationship to impaired fertility.

Pancreatitis is infrequent, but occasionally occurs without parotitis. Hyperglycemia may occur but is transient and is reversible.

Other complications that may occur include thyroiditis, mastitis, arthritis, glomerulonephritis, myocarditis, and thrombocytopenia.

Laboratory Diagnosis

- A swab from the parotid duct or other affected salivary gland ducts for viral isolation and/or reverse transcriptase-polymerase chain reaction (RT-PCR) testing is the preferred sampling method for mumps. Urine samples are no longer recommended. Mumps virus can also be detected from buccal swabs, throat washings, saliva or spinal fluid.
- If indicated for epidemiologic purposes, the New Mexico Department of Health Scientific Laboratory Division offers testing for the mumps virus by culture.
- Serum to test for mumps-specific IgM antibody should be collected within 5 days of illness onset. If the IgM antibody titer is negative, a second (convalescent) serum specimen for IgM antibodies is recommended 2--3 weeks after onset of signs (e.g., parotitis) or symptoms; a delayed IgM response has been observed in patients with confirmed cases of mumps, especially in vaccinated persons. The paired serum specimens also can be used to detect a significant rise (as defined by the testing kit instructions) in immunoglobulin G (IgG seroconversion) if measured by enzyme-linked immunosorbent assay or a fourfold rise in titer if measured using plaque-reduction neutralization assays or similar quantitative assay.
- A negative IgM result in vaccinated persons should not be used to rule out a mumps diagnosis. In the absence of another diagnosis, cases meeting the clinical case definition should be reported.
- Clinical samples should be obtained within 1-3 days after onset of parotitis.

Treatment

Supportive.

Surveillance

Case Definition:

Confirmed –

- A positive mumps laboratory confirmation for mumps virus with reverse transcription polymerase chain reaction (RT-PCR) or culture in a patient with an acute illness characterized by any of the following:
 - Acute parotitis or other salivary gland swelling, lasting at least two days
 - Aseptic meningitis
 - Encephalitis
 - Hearing loss
 - Orchitis
 - Oophoritis
 - Mastitis

- Pancreatitis

Probable –

- Acute parotitis or other salivary gland swelling lasting at least two days, or orchitis or oophoritis unexplained by another more likely diagnosis, and a person with a positive test for serum anti-mumps immunoglobulin M (IgM) antibody, OR
 - A person with epidemiologic linkage to another probable or confirmed case or linkage to a group/community defined by public health during an outbreak of mumps.

Suspect –

- Parotitis, acute salivary gland swelling, orchitis, or oophoritis unexplained by another more likely diagnosis, OR
- a positive lab result with no mumps clinical symptoms (with or without epidemiological-linkage to a confirmed or probable case).

Epidemiologic Classification for Internationally Imported and US-acquired Cases

Internationally imported case: An internationally imported case is defined as a case in which mumps results from exposure to mumps virus outside the United States (US) as evidenced by at least some of the exposure period (12–25 days before onset of parotitis or other mumps-associated complications) occurring outside the US and the onset of parotitis or other mumps-associated complications within 25 days of entering the US and no known exposure to mumps in the US during that time. All other cases are considered US-acquired cases.

US-acquired case: A US-acquired case is defined as a case in which the patient had not been outside the US during the 25 days before onset of parotitis or other mumps-associated complications or was known to have been exposed to mumps within the US.

US-acquired cases are sub-classified into four mutually exclusive groups:

- *Import-linked case:* Any case in a chain of transmission that is epidemiologically linked to an internationally imported case.
- *Imported-virus case:* A case for which an epidemiologic link to an internationally imported case was not identified but for which viral genetic evidence indicates an imported mumps genotype (i.e., a genotype that is not occurring within the US in a pattern indicative of endemic transmission. An endemic genotype is the genotype of any mumps virus that occurs in an endemic chain of transmission (i.e., lasting ≥ 12 months). Any genotype that is found repeatedly in US-acquired cases should be thoroughly investigated as a potential endemic genotype, especially if the cases are closely related in time or location.
- *Endemic case:* A case for which epidemiological or virological evidence indicates an endemic chain of transmission. Endemic transmission is defined as a chain of mumps virus transmission continuous for ≥ 12 months within the United States.
- *Unknown source case:* A case for which an epidemiological or virological link to importation or to endemic transmission within the US cannot be established after a thorough investigation. These cases must be carefully assessed epidemiologically to

assure that they do not represent a sustained US-acquired chain of transmission or an endemic chain of transmission within the US

Note: Internationally imported, import-linked, and imported-virus cases are considered collectively to be import-associated cases.

Reporting:

Report all suspected or confirmed cases of mumps to the Epidemiology and Response Division (ERD) at 505-827-0006. Information needed includes: patient's name, age, sex, race, ethnicity, home address, home phone number, occupation, and health care provider.

Case Investigation: Complete the CDC Mumps Surveillance Worksheet and mail to the Epidemiology and Response Division, P.O. Box 26110, Santa Fe, New Mexico 87502-6110, or fax to 505-827-0013. Investigation information should also be entered in NM-EDSS per established procedures.

Control Measures

1. Case management

1.1. Isolation: Droplet precautions for five days after onset of gland swelling. Exclusion from school, child care, and workplace for five days after onset of gland swelling.

1.2. Prophylaxis: Not applicable.

2. Contact management

2.1. Quarantine: Exclusion of exposed susceptible persons from school or daycare from day 12 through day 25 after exposure if other susceptible persons are present.

2.2. Prophylaxis:

2.2.a Complete immunization if not fully immunized (See table below). In an outbreak setting, excluded students can be readmitted immediately after immunization. Students who are exempted from mumps immunization should be excluded until at least 26 days after the onset of parotitis in the last person with mumps in the affected school.

2.2.b Immune globulin (IG) is not recommended or effective.

3. Prevention

Immunization: Routine immunization with the modified live virus vaccine at 12-15 months of age with a booster before school entry (e.g., 4-6 years of age), in the form of measles/mumps/rubella (MMR) vaccine or measles/mumps/rubella/varicella (MMRV) vaccine. Immunization or documentation of immunity is recommended for health care providers and for school personnel. See table below for vaccination recommendations.

Acceptable Presumptive Immunity to Mumps

1. Laboratory evidence of immunity by serum IgG
2. Documentation of physician-diagnosed mumps
3. Birth before 1957
4. Documentation of adequate vaccination
 - Adequate vaccination is now defined as one dose of a live mumps virus vaccine for preschool-aged children and adults *not* at high risk.
 - Adequate vaccination is now two* doses of a live mumps virus vaccine instead of one dose for
 - School aged children (i.e. K-12)
 - Adults at high risk (i.e. persons who work in health care facilities, international travelers, students at post-high school educational institutions).
 - Adequate vaccination for health care workers
 - Person born during or after 1957 without other evidence of immunity: two* doses of a live mumps virus vaccine.
 - Persons born before 1957 without other evidence of immunity: consider recommending one dose of a live mumps virus vaccine.
 - Adequate vaccination for outbreak settings
 - Children aged 1-4 years and adults at low risk: if affected by the outbreak, consider a second* dose live mumps virus vaccine.
 - Health care workers born before 1957 without other evidence of immunity: strongly consider recommending two* doses of live mumps virus vaccine.

* Minimum interval between doses is 28 days.

Managing Mumps in Child Care Centers

- Exclude symptomatic child from child care for five days from onset of gland swelling.
- Review the immunization status of all children in the facility to assure they have received their first mumps vaccination. Those not adequately immunized should be referred to their clinician.

References

American Academy of Pediatrics. In: Kimberlin, DW, et al eds. Red Book: 2018 Report of the Committee on Infectious Diseases. 31st ed. Itasca, IL: American Academy of Pediatrics; 2018.

Heymann D, ed. Control of Communicable Diseases Manual. 19th ed. Washington, DC: American Public Health Association; 2008.

Centers for Disease Control and Prevention. *Epidemiology and Prevention of Vaccine-Preventable Diseases*. William Atkinson, MD, MPH; Charles (Skip) Wolfe; Jennifer Hamborsky, MPH, CHES, eds. 12th ed. Washington DC: Public Health Foundation, May 2012.

See Mumps Fact Sheets ([English](#)) ([Spanish](#)).