

Mumps

Summary

Mumps is an acute viral disease that typically presents with swelling of the parotid (parotitis) or other salivary glands. Infection among adults is more likely to be severe. Diagnosis during outbreaks is often made clinically, but isolated or sporadic cases should be confirmed using PCR or viral culture. Serology is often unreliable. Treatment is supportive. Mumps can occur in vaccinated persons, but infection and complications are much more likely to occur in unvaccinated persons.

See here for [Surveillance Worksheet](#).

Agent

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

Transmission

Reservoir:

Humans.

Mode of transmission:

- Respiratory droplets, and by direct contact with the saliva of an infected person.

Period of communicability:

- For purposes of contact tracing, consider cases infectious from 2 days before onset of parotitis through 5 days after onset of parotitis.
 - Virus has been detected several days before and several days after the onset of swelling, but patients are most infectious and most likely to transmit virus from 1-2 days before to 5 days after onset of 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, but can be sublingual or submandibular. An estimated 20% of mumps infections among unvaccinated persons are asymptomatic. Mumps reinfection in patients who were previously infected, or recurrent mumps (when the parotid swelling resolves and then recurs on the same or other side weeks to months later) can also occur.

Complications may occur in cases with or without parotitis. Orchitis, or testicular inflammation, is the most common complication, occurring in as many as 30% of post-pubertal males (6% among vaccinated males). About half of patients with mumps orchitis develop testicular atrophy of the affected testicle(s).

Mastitis, or breast inflammation, occurs in approximately 30% of post-pubertal females (<1% among vaccinated females), while oophoritis, or ovarian inflammation, occurs in

approximately 7% of post-pubertal unvaccinated females (<1% among vaccinated females). There is no confirmed link between mumps-associated orchitis, mastitis, or oophoritis with permanently impaired fertility, although there is a theoretical risk of temporary sterility or subfertility among males with mumps orchitis.

More than half of people with mumps have cerebrospinal fluid pleocytosis, but <1% have symptoms of viral meningitis.

Pancreatitis or hearing loss both have an estimated frequency of approximately 4% among unvaccinated cases (<1% vaccinated). Meningitis occurs in approximately <1-10% of unvaccinated cases (<1% vaccinated) and encephalitis in <1% of cases (vaccinated or unvaccinated).

Nephritis and myocarditis have been reported from mumps patients but are uncommon, while death from mumps is extremely rare. There is no evidence that mumps infection during pregnancy results in congenital malformation.

Laboratory Diagnosis

- A buccal swab* from the parotid duct or other affected salivary gland ducts for reverse transcriptase-polymerase chain reaction (RT-PCR) testing (preferred) or viral isolation is the preferred sampling method for mumps, and should be collected as soon as possible after symptom onset; ideally within the first 3 days for best results, but up to 10 days after swelling onset. The parotid should be massaged for 30 seconds before swabbing.
 - See here for a CDC video demonstrating proper buccal swab collection: <https://www.youtube.com/watch?v=ThvoJBjsUvQ>
 - Urine samples for PCR may be useful in situations where the case does not have parotitis or salivary gland swelling, but does have orchitis/oophoritis, mastitis, pancreatitis, hearing loss, meningitis, or encephalitis.
 - Genotyping is available to distinguish between wild-type and vaccine-type mumps virus if necessary.
- In addition to PCR, the New Mexico Department of Health Scientific Laboratory Division offers viral culture for mumps testing, if indicated for epidemiologic purposes.
- If it has been >3 days since symptom onset, collect serum for IgM in addition to a buccal swab for PCR. Running the two tests together can help with interpreting results.
- Positive IgM serology does not confirm a mumps diagnosis. IgM responses may be transient, delayed, or not detected, due to prior contact with the virus through infection or vaccination. A negative IgM result should also not be used to rule out a mumps diagnosis. In the absence of another diagnosis, cases meeting the clinical case definition should be reported.

* A “buccal swab” is a swab of the buccal mucosa, or the lining of the cheeks.

Treatment

Supportive.

Other Causes of Parotitis

Influenza (especially influenza A) has been noted to cause parotitis (sometimes called “flumps”) and suspected mumps cases should concurrently be tested for influenza.

Other common infectious causes of parotitis include Epstein-Barr Virus, cytomegalovirus, parainfluenza types 1 and 3, enteroviruses, lymphocytic choriomeningitis virus, HIV, nontuberculous mycobacterium, and gram-positive and gram-negative bacteria.

Non-infectious causes include (but are not limited to) dental abscesses, allergic reactions, salivary duct blockages, and Sjögren’s syndrome.

Mumps is the only known cause of epidemic parotitis.

Surveillance

Case Definition (2024):

Clinical Criteria

In the absence of a more likely alternative diagnosis, an acute illness characterized by:

- Parotitis or swelling of other (non-parotid) salivary gland(s) of any duration, **or**
- At least one of the following mumps-associated complication(s):
 - Aseptic meningitis
 - Encephalitis
 - Hearing loss
 - Orchitis
 - Oophoritis
 - Mastitis
 - Pancreatitis

Laboratory Criteria

- Confirmatory laboratory evidence^a
 - Positive RT-PCR for mumps-specific nucleic acid^b, **or**
 - Isolation of mumps virus (culture), **or**
 - Significant rise (i.e., at least a 4-fold rise in a quantitative titer or seroconversion^c) in paired acute and convalescent serum mumps IgG antibody^b.
- Supportive laboratory evidence
 - Positive test for serum mumps IgM antibody^{b,d}.

Epidemiologic Linkage Criteria

- Exposure to or contact with a confirmed mumps case, **or**
- Member of a group or population identified by public health authorities as being at increased risk for acquiring mumps because of an outbreak.

Confirmed:

- Meets confirmatory laboratory evidence.

Probable:

- Meets clinical criteria **and** epidemiologic linkage criteria, **or**
- Is IgM+ **and** has had ≥ 2 day duration of parotitis or other salivary gland swelling (or a mumps-related complication) **and** does *not* meet epidemiologic linkage criteria.

Suspect

- Meets clinical criteria, but does not meet laboratory or epidemiologic criteria, **or**
- Is IgM+, does *not* meet clinical criteria, but does have documentation that mumps was suspected.

Note: The categorical labels used here to stratify laboratory evidence are intended to support the standardization of case classifications for public health surveillance. The categorical labels should not be used to interpret the utility or validity of any laboratory test methodology.

^a A negative laboratory result in a person with clinically compatible mumps symptoms does not rule out mumps as a case.

^b Not explained by MMR vaccination during the previous 6-45 days.

^c Seroconversion is defined as a negative serum mumps IgG followed by a positive serum mumps IgG.

^d May be ruled out by a negative convalescent mumps IgG antibody using any validated method.

Reporting:

Report all suspected or confirmed cases of mumps to the New Mexico Department of Health's Infectious Disease Epidemiology Bureau (IDEB) at 1-833-796-8773. 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 IDEB, P.O. Box 26110, Santa Fe, New Mexico 87502-6110, or (preferably) faxed to 505-827-0013. Investigation information should also be entered in NMEDSS by an epidemiologist per established procedures.

Control Measures

1. Case management
 - 1.1. Isolation: Droplet precautions for five days after onset of gland swelling. Exclusion from school, childcare, and workplace for five days after onset of gland swelling.
2. Contact management

2.1. See below for presumptive evidence of immunity to mumps:

Acceptable Presumptive Immunity to Mumps

1. Laboratory evidence of immunity by serum IgG
 - a. Note: IgG antibody does not necessarily predict protection; during an outbreak, close contacts of mumps patient(s) should not be tested for serologic evidence of immunity (because a positive IgG titer may indicate acute or recent infection).
2. Laboratory confirmation of disease
3. Birth before 1957
4. Documentation of adequate vaccination:
 - At least 1 dose of MMR for preschool-age children and adults not at high risk
 - 2 doses of MMR for school-aged children, adolescents, and adults at high risk, including college students, healthcare personnel, and international travelers
 - Adequate vaccination for outbreak settings
 - Children aged 1-4 years and adults at low risk: if affected by the outbreak, consider a second* dose of MMR vaccine.
 - Health care workers born before 1957 without other evidence of immunity: strongly consider recommending two* doses of MMR vaccine.
 - People previously vaccinated with 2 doses who are identified as being part of a group or population at increased risk for acquiring mumps because of an outbreak: recommended to receive a third dose of MMR.

* Minimum interval between doses is 28 days.

2.2. Quarantine: Exclusion of exposed people without presumptive evidence of immunity (as listed above) from school or daycare from day 12 through day 25 after exposure may be recommended; consult with NMDOH.

2.3. Symptom Monitoring: Regardless of prior immunity or vaccination history, all exposed contacts should be advised to monitor for signs and symptoms of mumps for 25 days after exposure, avoid large gatherings or events with intense close contact if possible (because mumps can spread before swelling appears), and self-isolate for 5 days if they develop any symptoms.

2.4. Post-Exposure Prophylaxis:

2.4.a Vaccination as post-exposure prophylaxis is not effective at preventing mumps after an exposure has already occurred. However, administering MMR vaccine can protect people from future exposures in outbreak settings, and reduce the duration of an outbreak.

2.4.b Students in grades K-12, students in post-high-school educational settings, and healthcare personnel who have a history of 1 dose of MMR vaccine may remain at school/work but are recommended to receive their second vaccine dose as soon as possible, and to monitor for symptoms for 25 days after last exposure.

2.4.c Students who are not immunized for mumps may need to be excluded from school until at least 25 days have passed since the onset of parotitis in the last person

with mumps in the affected school. Consult with NMDOH. Healthcare personnel without evidence of immunity should be excluded from the 10th day after the first unprotected exposure to mumps through the 25th day after the last exposure.

2.4.d In some circumstances, NMDOH may recommend a third dose of MMR for fully vaccinated people considered to be at increased risk of exposure during an outbreak. In this situation, people who have a history of 2 doses of MMR and are recommended to receive a third dose may remain in the outbreak setting even if they do not accept the third MMR dose.

2.4.e Immune globulin (IG) is neither recommended nor effective as post-exposure prophylaxis.

3. Prevention

3.1. Immunization: Routine immunization with two doses of the MMR vaccine, with the first typically given at 12-15 months of age, and the second given before school entry (e.g., 4-6 years of age). Immunization or documentation of immunity is recommended for health care providers and for school personnel. See table above for vaccination recommendations.

3.1.a Although the measles-mumps-rubella-varicella (MMRV) vaccine is also acceptable for either dose in children aged 12 months through 12 years, the preference is to use MMR for the first dose in children aged 12-47 months to reduce the risk of side effects.

Management of Mumps in Child Care Centers

- Exclude symptomatic case from childcare 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. Both staff and children who are not adequately immunized should be referred to their clinician.

References

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