

Mumps

1. DISEASE REPORTING

1.1 Purpose of Reporting and Surveillance

1. To assess the burden of mumps infections in Oregon.
2. To identify cases and educate potentially exposed persons about signs and symptoms of disease, thereby reducing the risk of further transmission.
3. To identify and vaccinate susceptible individuals.

1.2 Laboratory and Physician Reporting Requirements

Physicians are required to report all cases (including suspected cases) within one working day. Labs are required to report mumps-specific positive tests (e.g., IgM, virus isolation, PCR) within one working day.

1.3 Local Health Department Reporting and Follow-Up Responsibilities

1. Report all confirmed and presumptive cases (see definitions below) to ACDP electronically or by fax within one working day of initial report.
2. Begin follow-up investigation within one working day.
3. Submit a mumps Case Investigation form (or approved electronic alternative) by the end of the calendar week.
4. Initiate appropriate control measures within 1 working day of initial report (see §5, Controlling Further Spread).

2. THE DISEASE AND ITS EPIDEMIOLOGY

2.1 Etiologic Agent

Mumps is caused by a single-stranded, RNA paramyxovirus

2.2 Description of Illness

Prodromal symptoms are nonspecific; they include myalgia, anorexia, malaise, headache, and low-grade fever, and may last for 3–4 days.

Parotitis (inflammation and swelling of the parotid salivary glands) is the most common manifestation of clinical mumps, affecting 30–40% of infected persons. Parotitis can be unilateral or bilateral; other combinations of single or multiple salivary glands may be affected. Parotitis usually occurs within the first 2 days of symptom onset and may present as an earache or tenderness on palpation of the angle of the jaw. Symptoms usually decrease within 1 week and generally resolve within 10 days.

Up to 20% of infections are asymptomatic; an additional 40–50% may have only nonspecific or primarily respiratory symptoms.

The most common complication is orchitis, affecting up to 50% of males who have reached puberty. While painful, only rarely does this lead to infertility. Other complications are rare, but may include encephalitis, meningitis, oophoritis, mastitis, pancreatitis, myocarditis, arthritis, and nephritis. You name it, we'll inflame it. Spontaneous abortion (miscarriage) can occur if an infection occurs during pregnancy, particularly in the first trimester. Mumps infection can rarely (~1 in 10,000) cause deafness, which is usually permanent.

Differential Diagnosis: Parotitis is not pathognomonic; it can also be caused by infection with cytomegalovirus, parainfluenza virus types 1 and 3, influenza A, Coxsackie A, echovirus, lymphocytic choriomeningi-

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tis virus, and HIV, as well as *Staphylococcus aureus* and other bacteria. Non-infectious causes of parotitis include drugs, tumors, immunologic diseases, and obstruction of the salivary duct.

2.3 Reservoirs

Infected humans. Although persons with asymptomatic or atypical infection can transmit the virus, no chronic carrier state is known to exist.

2.4 Modes of Transmission

Respiratory droplets, direct contact with the saliva of an infected person and perhaps airborne transmission.

2.5 Incubation Period

Usually 16–18 days (range 12–25 days).

2.6 Period of Communicability

Typically from 3 days before until 5 days after onset of symptoms.

2.7 Treatment

No specific treatment.

3. CASE DEFINITIONS, DIAGNOSIS, AND LABORATORY SERVICES

3.1 Confirmed Case Definition(s) (reportable to OHS)

- Isolation of mumps virus from any clinical specimen, or
- Acute onset of tender, self-limited swelling of any salivary gland, lasting 2 or more days, and without other apparent cause plus one of the following:
 1. Detection of mumps virus nucleic acid from a clinical specimen, or
 2. Acute- and convalescent-phase mumps IgG assays by any standard serologic assay showing at least a 4-fold titer increase and not explained by vaccination or receipt of antibody-containing blood products, or
 3. Positive serologic test for mumps immunoglobulin M (IgM) antibody not explained by vaccination or receipt of antibody-containing blood products.

3.2 Presumptive (reportable to OHS)

Any person epidemiologically linked to a confirmed case, with acute onset of tender, self-limited swelling of a salivary gland lasting >2 days, and lacking any other apparent cause. The salivary gland swelling can be unilateral or bilateral, and it doesn't have to be the parotid.

3.3 Suspect (not reportable to OHS)

Any patient who would be presumptive if only they were epi-linked! Suspect cases should be reported by physicians to local health departments, but are not officially reportable to ACDP. (Of course, we're always happy to talk about them and help arrange for the kind of testing that may upgrade their status.)

3.4 Services Available (or not) at the Oregon State Public Health Laboratory

Both CDC and the Oregon State Public Health Laboratory have found both PCR testing and culture for the mumps virus to be insensitive. Therefore, until further notice, we recommend serologic testing when trying to confirm a diagnosis of mumps.

CDC is currently offering to test, at no charge, serum from patients with unexplained parotitis for anti-mumps IgM and IgG antibody. Serologic testing is available at commercial labs as well, and results may be available more quickly.

The first (acute) serum specimen should be collected within 5 days of illness onset and tested for IgM antibody. If this test is negative, a second (convalescent) serum specimen for IgM antibodies should be collected 2–3 weeks after onset of signs (e.g., parotitis) or symptoms; delay in the rise of IgM titers 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 in IgG antibody levels.

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As with measles and rubella, elevated mumps IgM levels may be transient or absent in persons who have had any doses of mumps-containing vaccine. Experience suggests that IgM assays from persons with acute infections may be negative in up to 50% of previously immunized individuals (i.e., a negative IgM does not rule out infection in a vaccinated person.)

In contrast, IgG levels in previously vaccinated individuals may rise rapidly after exposure or infection. By the time an “acute” sample is collected, IgG levels may already be sky high, often making it difficult to detect a 4-fold rise in a convalescent specimen.

4. ROUTINE INVESTIGATION

Because clinical diagnosis of mumps may be unreliable, efforts should be made to confirm each suspect case with lab testing. Studies suggest that <20% of sporadic parotitis is due to mumps infection. Mumps is the only known cause of epidemic parotitis, however. Experience indicates that case investigations combined with lab testing will result in many suspected mumps cases being discarded.

4.1 Identify the Source of Infection.

Try to determine if a suspected case was in contact with a known case or had recently traveled to area-where mumps transmission is being reported.

4.2 Identify Potentially Exposed Persons (Contacts)

Cases are potentially infectious from 3 days before to 5 days after onset of symptoms. To have a reasonable chance of exposure, persons must have come within range of droplet contamination from an infected person (say, within 1 m) or had other direct contact with their saliva. This contact must have occurred whilst the case was infectious and without the benefits of appropriate personal protective equipment (e.g., gloves and mask). The length of time a person must have been within this 1-m bubble to be worth worrying about is undefined. For action purposes, we will arbitrarily say that it must be more than 5 minutes—and will modify this threshold as better data become available.

Identify household and other contacts (e.g., school or day care classmates and contacts in the healthcare setting) who may have been exposed to the case during the infectious period.

5. CONTROLLING FURTHER SPREAD

5.1 Education

Advise patients to stay home and not go to school, work, public places or social activities for 5 days after illness onset. Make sure household members are immune to mumps. If family members are not immune, they should avoid contact during the time the case is infectious.

Instruct cases to wash their hands often or use hand sanitizer, to avoid sharing drinking glasses or eating utensils, to cover their coughs and sneezes with a tissue or their antecubital fossa and to stay home until 5 days after the onset of symptoms. Instruct contacts or parents to look for the symptoms and signs of mumps from 12 days after the first day of contact with a case during the period of communicability, through 25 days after the last contact. If suggestive symptoms develop, they should call their provider as soon as possible.

5.2 Isolation and School or Work Restrictions

Keep hospitalized patients under droplet precautions for 5 days after the onset of symptoms.

Cases who are employees of schools, day cares, and healthcare facilities should be excluded from work during the period of communicability.

Exclude children with confirmed and presumptive mumps from school or day care as long as they are contagious.

5.3 Protection of Contacts

1. Active Immunization

Preschool children and adults not at high risk should receive 1 dose of MMR; for children in grades K–12 and adults at high risk (i.e., persons who work in healthcare facilities, international travelers, and students

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at post-high-school educational institutions), 2 doses of MMR are recommended. Individuals who have had mumps do not need to receive the mumps vaccine.

Acceptable presumptive evidence of immunity to mumps includes one of the following: 1) documentation of adequate vaccination, 2) laboratory evidence of immunity, 3) birth before 1957, or 4) documentation of physician-diagnosed mumps.

The following are considered evidence of immunity to mumps for healthcare workers.

In non-outbreak settings:

1. Documented physician-diagnosed mumps
2. Serologic evidence of immunity
3. Documented receipt of
 - 1 dose of mumps vaccine if born before 1957, or
 - 2 doses of mumps vaccine if born during or after 1957

During an outbreak, raise the bar for “evidence of immunity” to require one of the following:

1. Documented physician-diagnosed mumps
2. Serologic evidence of immunity
3. Documented receipt of two doses of mumps vaccine regardless of birth

Contraindications to vaccine include anaphylactic allergy to neomycin, gelatin or a previous dose of MMR vaccine; pregnancy; and immunodeficiency or immunosuppression. Persons with moderate or severe acute illness should not be vaccinated until the illness has resolved. Receipt of antibody-containing blood products (e.g., immune globulin, whole blood or packed red blood cells) may interfere with seroconversion following mumps vaccination. Vaccine should be given 2 weeks before, or deferred for at least 3 months following administration of an antibody-containing blood product.

2. Passive Immunization with Immune Globulin

IG is not effective; forget it.

6. MANAGING SPECIAL SITUATIONS

6.1 Control of Institutional Clusters

In situations where >5 cases occur in one single institution within two incubation periods (50 days) additional measures are appropriate.

Although mumps vaccination has not been shown to be effective in preventing mumps in persons already exposed, it will prevent infection in those persons who have yet to be exposed. If susceptible persons can be vaccinated early in the course of an outbreak, they can be protected. However, cases are expected to continue to occur among newly vaccinated persons who are already exposed for at least 3 weeks following vaccination because of the long incubation period for mumps.

The main strategies for controlling a mumps outbreak are defining the at-risk population and transmission setting, identifying and isolating suspected cases, and rapidly identifying and vaccinating susceptible persons or, if a contraindication to MMR vaccine exists, excluding susceptible persons from the setting to prevent exposure and transmission.

Offer MMR vaccine to persons without evidence of immunity.

During an outbreak and depending on the epidemiology of the outbreak (e.g., the age groups or institutions involved), a second dose of vaccine should be considered for adults and for children aged 1–4 years who have received one dose. The second dose can be administered as early as 28 days after the first dose.

If mumps is in your area, alert physicians, hospital emergency departments, student infirmaries, and other officials of the potential for additional cases; encourage them to consider mumps in persons with parotid swelling and fever, to report suspect cases promptly, and to obtain appropriate specimens for laboratory confirmation. Such “enhanced surveillance” should continue for 50 days (two times the maximum incubation period) after the date of illness onset in the last identified case.

Exclude persons without evidence of immunity to mumps from daycare centers, schools, colleges and healthcare institutions affected by a mumps outbreak. Once vaccinated, these persons can be readmitted.

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Those who remain unvaccinated should be excluded for at least 25 days after the onset of symptoms in the last person with mumps in the affected institution.

6.2 Healthcare Settings

Isolation & Quarantine

Patient isolation. Do not allow suspect mumps cases to sit in waiting area for prolonged periods of time; and keep them more than three feet from other patients. Ask that they wear a surgical mask. Droplet precautions should be maintained for 5 days after the onset of symptoms.

Patients known to have been cared for by a healthcare worker with confirmed or presumptive mumps during the communicable period (from 3 days before until 5 days after onset of illness) should be notified. This will not prevent illness in such patients, because vaccination after exposure is not effective; however, it will enable the patients to isolate themselves promptly should they develop symptoms. Patients known to have been cared for by a healthcare worker with suspected mumps need not be notified while confirmatory tests are pending.

If an employee or healthcare worker develops a suspected case of mumps, exclude him from work until 5 days after the onset of symptoms.

Healthcare workers without evidence of immunity who have had unprotected exposures to mumps (defined as being within three feet of a patient with mumps for 5 minutes without the use of a surgical mask)

1. Exposed healthcare workers with no documentation of mumps vaccination should be excluded from work during the 12th through the 25th day after exposure. Meanwhile, attempts should be made to vaccinate the healthcare worker.
2. Exposed healthcare workers with documentation of a single dose of mumps vaccine may work following an exposure to mumps, but they should be given a second dose as soon as possible, but no sooner than 28 days after the first.

Healthcare workers with evidence of immunity do not need to be excluded from work following an unprotected exposure. However, because 1 dose of MMR vaccine is about 80% effective in preventing mumps and 2 doses are about 90% effective, some vaccinated personnel may contract mumps. Therefore, healthcare workers should be educated about symptoms of mumps, including non-specific presentations, and should notify employee health if they develop these symptoms.

UPDATE LOG

June 2008. Changes included an adjusted period of communicability and an expanded lab recommendation to reflect new CDC recommendations. (Juventila Liko)