

# Alaska Section of Epidemiology Mumps Investigation Guidelines

## **Pathogen**

Mumps is an acute viral illness caused by an RNA virus in the Paramyxoviridae family.

## **Clinical symptoms**

Prodromal symptoms are nonspecific and may include myalgia, anorexia, malaise, headache and low-grade fever. The most common manifestation is unilateral or bilateral swelling of one or more of the salivary glands, usually the parotid glands (parotitis), which occurs in 30%-40% of infected persons. Parotitis tends to occur within the first 2 days and may be first noted as earache and tenderness on palpation of the angle of the jaw. Symptoms tend to decrease after 1 week and usually resolve after 10 days.

Approximately 40-50% of infections may only have nonspecific or respiratory symptoms only. As many as 20% of mumps infections are asymptomatic.

## **Differential diagnosis**

Mumps virus is the only cause of epidemic parotitis. Parotitis – especially sporadic cases – may be due to viruses other than mumps. Parotitis can also be caused by Epstein-Barr virus, human herpesvirus B6 (the cause of roseola) cytomegalovirus, parainfluenza virus types 1 and 3, influenza A virus, coxsackieviruses and other enteroviruses, lymphocytic choriomeningitis virus, human immunodeficiency virus, *Staphylococcus aureus*, and nontuberculous *Mycobacterium*.

## **Complications**

Orchitis (testicular swelling) is a common complication and may occur in as many as 50% of post-pubertal males. Central nervous system (CNS) involvement is common but fewer than 10% have symptoms of CNS infection. Other rare complications include arthritis, mastitis, glomerulonephritis, myocarditis, endocardial fibroelastosis, thrombocytopenia, cerebellar ataxia, transverse myelitis, ascending polyradiculitis, pancreatitis, oophoritis, and hearing impairment.

Mumps during the first trimester is associated with an increased rate of spontaneous abortion, but although mumps virus can cross the placenta, there is no evidence that this results in congenital malformation.

## **Modes of transmission**

Transmitted by contact with respiratory secretions or droplets from the respiratory tracts of infected persons.

## **Mumps exposure**

Unprotected face-to-face (<3 feet) contact with an infectious person for at least 5 minutes.

## **Incubation period**

Usually 16 to 18 days, but cases may occur 12 to 25 days after exposure.

## **Period of communicability**

Communicability is probably highest from 2 days before to 5 days after onset of parotitis; mumps virus has been isolated in saliva from 7 days before through 9 days after onset of swelling.

## **Laboratory testing guidance**

Polymerase chain reaction (PCR) is the preferred method for confirming an acute mumps case; a buccal swab is the preferred sample\*. This test type is available thru the Alaska State Virology Laboratory and Quest Diagnostics. Ideally, clinical specimens should be obtained within 3 days and not more than 8 days after parotitis onset.

Test Method	Buccal or Oral Swab	Location	Turn-around Time
RT-PCR*	Yes	ASVL Quest	3 days
Viral Culture	Yes	LabCorp	3 weeks

The presence of serum mumps immunoglobulin M (IgM), a significant rise in immunoglobulin G (IgG) antibody titer in acute- and convalescent-phase serum specimens, and IgG seroconversion, can also be used to aid in the diagnosis of mumps infection. However, in both unvaccinated and previously vaccinated persons, false-positive serologic results can occur because assays may be affected by other diagnostic entities that cause parotitis.

## **Specimen Collection**

### Buccal or Throat (Oral) Swab

- A buccal swab is the preferred specimen.
- Collect as soon as mumps is suspected.
- Massage the parotid gland (the space near the upper rear molars between the cheek and teeth) for 30 seconds, then vigorously swab the parotid area with a sterile synthetic swab (e.g., Dacron).
- Detailed buccal swabbing instructions are available at <http://www.cdc.gov/mumps/lab/detection-mumps.html>
- Place swab into 2-3 ml of liquid universal transport medium (UTM).
- Clearly label the tube with the patient's full first and last name AND the patient's date of birth (DOB) OR other identifying number.

### Urine

- Buccal specimens are preferred for mumps testing.
- Collect 50-100 mL of urine in a clean/sterile leak-proof container, not in UTM.
- A buccal or throat swab must also be collected and submitted.
- Clearly label both sample containers with the patient's full first and last name AND the patient's date of birth (DOB) OR other identifying number.

Submit specimens to either the nearest public health laboratory (Anchorage or Fairbanks - [Alaska State Public](#)

[Health Laboratories](#)) for testing using the [Alaska State Virology Laboratory \(ASVL\) Requisition Form](#) or Quest Diagnostics.

Specimens should be shipped on cold packs within 24 hours. If shipping is delayed, freeze at -70°C and ship frozen.

### Case definition

#### Suspected

- 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).

#### Probable

- Acute parotitis or other salivary gland swelling lasting at least 2 days, or orchitis or oophoritis unexplained by another more likely diagnosis, in:
  - 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.

#### 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 2 days
- Aseptic meningitis
- Encephalitis
- Hearing loss
- Orchitis
- Oophoritis
- Mastitis
- Pancreatitis

### SOE reporting requirements

- Healthcare providers must report suspected or probable mumps cases to the SOE within 2 working days.
- Clusters or outbreaks of suspected or confirmed mumps are immediately reportable to the SOE.
- Suspect, probable and confirmed cases are entered into NBS.
- PHN or EPI nurse complete the mumps interview form: <http://dhss.alaska.gov/dph/Epi/id/SiteAssets/Pages/Mumps/AKMumpsInterviewCombo.pdf>

EPI staff will enter mumps surveillance form data into NBS.

- Advise Immunization Program Manager
- FTR for outbreaks

### Immunization

Live-attenuated mumps vaccine is given as part of measles, mumps and rubella (MMR) vaccine in the U.S. Post-licensure data estimate the effectiveness of 1 dose of mumps vaccine at approximately 80% (64%-95%) and two doses at 90% (88%-90%). However, in recent large outbreaks, mumps infections have occurred in many persons with a history of 2 doses of mumps vaccine and some studies indicate that vaccine-induced immunity may wane.

### Postexposure prophylaxis (PEP)

None. Neither mumps vaccine nor immune globulin (IG) is effective for mumps post-exposure prophylaxis.

### Case investigation

1. Confirm clinical signs and symptoms of mumps.
2. Arrange for laboratory testing. Submit specimens to ASVL for testing, if feasible.
3. Ensure case isolation for 5 days after parotitis onset.
4. Interview the suspected case to determine the possible source of exposure, i.e., contact with a person with mumps and/or recent travel to an area of the world where mumps is endemic/epidemic.
5. Identify all household and other close contacts and assess their mumps immunity status. The recommended period for contact tracing is two days before through five days after parotitis onset.
6. Assess occupational status of household contacts; if any household member is a healthcare worker, see section on “Mumps in Healthcare Settings”.
7. Refer known susceptible contacts and contacts who’ve had only one dose of MMR vaccine or who have unknown MMR immunization status. Postexposure vaccination will not prevent or alter the clinical severity of mumps. However, if the current exposure to mumps does not cause infection, vaccination should induce protection against subsequent infection.
8. If one confirmed case occurs in a childcare center or school, exposed persons who have had only one dose of MMR should be recommended to receive a second dose ( $\geq 28$  days after the first dose). In outbreaks among older children and adolescents, offering a third MMR dose to contacts with 2 documented MMR doses may be considered.

### Mumps on College Campuses and Other Congregate Living Settings

Notify SOE of any suspected mumps cases in college students. Mumps can spread quickly on college campuses even among persons with two doses of MMR vaccine. Action steps should include immediate testing and isolation of the suspected case, and consideration of

vaccination of contacts.

Contacts who have only received 0 or 1 dose of MMR vaccine should be brought up to date. While MMR vaccination will not serve as post-exposure prophylaxis, it may protect against future exposures if transmission continues in the same setting.

The same approaches used on college campuses may be applied to other settings as well, e.g., jails, prisons, military barracks or other congregate living settings.

### **Mumps in Healthcare Settings**

Healthcare personnel with active mumps illness and those who lack evidence of immunity and have had unprotected exposures to mumps should be excluded from work from the 12th day after the first unprotected exposure to mumps through the 25th day after the last exposure. Exposure date is counted as day 0, and precautions may be removed on day 26. Unprotected exposures are defined as being within three feet of a patient with a diagnosis of mumps without the use of proper personal protective equipment. Irrespective of their immune status, all exposed healthcare personnel should report any signs or symptoms of illness during the incubation period, from 12 through 25 days after exposure. See:

<http://www.cdc.gov/vaccines/pubs/surv-manual/chpt09-mumps.html>

### **Reference**

SOE Mumps Investigation Guidelines adapted from California Department of Public Health – March 2016.

Available at:

<https://archive.cdph.ca.gov/HealthInfo/discond/Documents/CDPHMumpsQuicksheet.pdf>