

# Local Health Department Guidelines for the Epidemiological Investigation and Control of Mumps

Maryland Department of Health  
Prevention and Health Promotion Administration  
Infectious Disease Epidemiology and Outbreak Response Bureau  
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## Introduction and Background

Mumps is a viral illness caused by a paramyxovirus and is usually characterized by parotitis (swollen salivary glands in the cheek and jaw area) and fever. Complications of mumps include orchitis, oophoritis, mastitis, pancreatitis, hearing loss, meningitis, and encephalitis. Historically, mumps was a frequent cause of illness in young children. However, since the mumps vaccine was licensed in 1967 and recommended for routine immunization in 1977, mumps incidence has declined to very low levels in the U.S. Mumps cases and outbreaks continue to occur sporadically and often involve individuals who recently traveled to mumps-endemic regions outside the U.S. or who were exposed to imported cases of mumps.

This document consolidates mumps guidance from different CDC resources for use by health department staff and other partners involved in mumps case investigations and outbreak response. The recommendations in this document are intended to provide general guidance. Mumps cases and outbreaks should be evaluated individually to determine the appropriate steps for prevention and control.

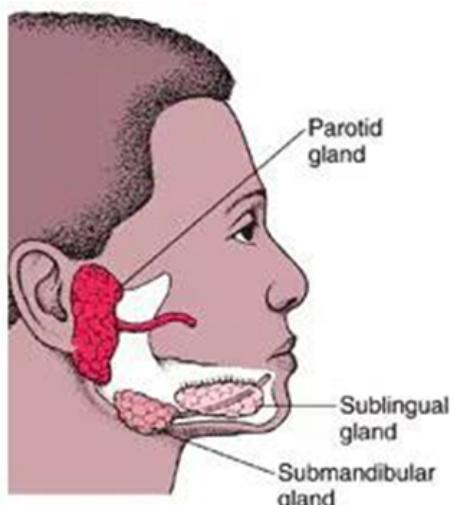
Questions regarding this document can be directed to:

Maryland Department of Health  
Infectious Disease Epidemiology and Outbreak Response Bureau  
201 W. Preston Street, 3rd Floor  
Baltimore, MD 21201  
Ph (410) 767-6700

## I. Mumps Overview

### Disease Description

Mumps is an acute viral illness caused by a paramyxovirus and usually involves pain, tenderness, and swelling in one or both parotid salivary glands, which is called parotitis. Swelling may be unilateral or bilateral and usually lasts 3 to 7 days, but can last up to 10 days. Other salivary glands (submandibular and sublingual) under the floor of the mouth also may swell, but do so less frequently.



[Source: CDC: Clinical Overview of Mumps](#)

Nonspecific prodromal symptoms may precede parotitis by several days, including low-grade fever (which may last 3–4 days), myalgia, loss of appetite, malaise, headache, and respiratory symptoms.

Mumps complications include orchitis (inflammation of the testicles), oophoritis (inflammation of the ovaries), mastitis (inflammation of the breast), meningitis, encephalitis, pancreatitis, and hearing loss. Complications occur less frequently in vaccinated patients.

#### **INCUBATION PERIOD**

- On average 16 to 18 days, with a range of 12 to 25 days

#### **MODE OF TRANSMISSION**

- Through direct contact with saliva or respiratory droplets from the mouth, nose, or throat

#### **INFECTIOUS PERIOD**

- 2 days before through 5 days after the onset of parotitis

### **Prevention**

Vaccination is the most effective way to prevent mumps infection.

- Mumps vaccine is usually administered in the combination measles, mumps, and rubella (MMR) or measles, mumps, rubella, and varicella (MMRV) vaccines. A single antigen mumps vaccine is not available in the US.
- CDC recommends children get two doses of MMR or MMRV vaccine. The current ACIP recommendations for routine vaccination for children indicate a first dose of mumps virus-containing vaccine at 12-15 months of age with a second dose at school entry (4-6 years). Teens and adults should also be up to date on their MMR vaccination. ACIP recommends a third dose of MMR vaccine for people at increased risk of acquiring mumps during an outbreak.
- Any clinically significant adverse events, unexpected events following vaccination, and/or events listed on the vaccine manufacturer's package insert should be reported to the [Vaccine Adverse Event Reporting System \(VAERS\)](#).
- For more information on measles vaccination, go to [CDC Mumps Vaccination](#).

### **Laboratory Tests and Specimen Collection**

- Individuals for whom mumps is suspected due to clinical presentation and exposure history should be tested for mumps.
- If testing has not been performed at a hospital or commercial laboratory, and initial testing is instead requested at MDH Laboratory, **MDH epidemiologists must approve mumps testing before specimens are submitted to MDH Laboratory**. Such situations include if an LHD staff collects the specimen or in certain outbreak situations. Call 410-767-6700 during business hours to obtain approval. For urgent matters after-hours, call 410-795-7365.
- PCR is the preferred testing method for mumps diagnosis.
- A buccal swab should be collected for PCR testing, ideally within 3 days of symptom onset.

- A sample for serologic testing should also be collected if it has been more than 3 days since symptom onset or if any of the following are present: orchitis/oophoritis, mastitis, pancreatitis, hearing loss, meningitis, or encephalitis.
- Other common respiratory viruses can cause signs and symptoms similar to mumps. Consider testing for other infectious etiologies that can cause parotitis, such as influenza, parainfluenza, EBV, and adenovirus. Note that the preferred specimen type for these tests is an NP swab, not a buccal swab, so additional specimen types would need to be collected.
- See Table 1 below for more information on mumps testing at the MDH Lab.

**Table 1: MDH Laboratory Testing for Mumps - PCR and Serology**

	PCR (preferred)	Serology (IgM)
<b>Time of specimen collection</b>	Ideally, <u>within</u> 3 days of symptom onset	If <u>more than</u> 3 days since symptom onset, collect serology (as well as buccal swab for PCR)  If any of the following are present, regardless of number of days since symptom onset, collect serology and buccal swab: orchitis/oophoritis, mastitis, pancreatitis, hearing loss, meningitis, encephalitis
<b>Site of specimen collection</b>	Buccal swab ( <a href="#">CDC training video</a> )	Serum
<b>Method of collection</b>	Buccal swab specimen on Dacron™ swab in viral transport media	5 mL of whole blood or 4 mL of serum in red-top or gold-top vacutainer
<b>Comments</b>	PCR testing is preferred to serologic testing for mumps whenever possible. This is because PCR is more sensitive and specific than serologic assays to detect IgM.	
<b>Specimen identification</b>	Specimens should be labeled with the patient's first and last name, address, and DOB, as well as specimen type/source and the date and time of collection. The specimen/sample must be properly labeled and match the test requisition or electronic test order.	
<b>Turnaround time</b>	3-28 business days	2-5 business days
<b>Requisition</b>	<a href="#">MDH Form 4676</a>	<a href="#">MDH Form 4677</a>
<b>Package/shipping/transport</b>	Transport at 2-8°C on cold packs for overnight shipping. For delayed shipping, transport at -20°C or colder on dry ice.	Whole blood or separated serum transported at 2-8°C on cold packs up to 2 days after collection. Separated Serum only: For >2 days after collection, transport at -20°C or colder on dry ice. WHOLE BLOOD CANNOT BE FROZEN.
	<u>All specimens:</u> Specimens must be packaged in a triple packaging system to ensure that, under normal conditions of transport, they cannot break, be punctured, or leak their contents (Refer to pages 9 & 10 for triple packing guidance).* *Refer to current federal regulations for specific shipping requirements.	
	Specimens should be shipped to: MD Department of Health Laboratories Administration, Central Laboratory 1770 Ashland Avenue Baltimore, Maryland 21205	

\*[MDH Guide to Public Health Laboratory Services](#), starting on page 102 (IgM only)

## Treatment

There is no specific antiviral treatment for mumps infection. Treatment and management are supportive.

## Reporting

The [Code of Maryland Regulations \(COMAR\) 10.06.01 Communicable Diseases](#) requires healthcare providers, hospitals, laboratories, and school and childcare facility personnel to report cases of mumps to the [health department](#).

When reporting a case of mumps, information should include:

- Identifying information (name, DOB, address, telephone number)
- Demographic information (age, sex, race, etc.)
- Clinical details, such as the date of illness onset and symptoms
- Laboratory results (if available)
- Vaccination status
- Risk factors
- Occupation
- Contacts for investigation and prophylaxis

## II. Mumps Case and Outbreak Investigations

Note: Mumps case and outbreak investigations are often complex and require immediate follow-up. Local health departments are encouraged to coordinate response actions, including testing, post-exposure prophylaxis, and exclusion recommendations, with MDH. To speak with an MDH epidemiologist during regular business hours, call 410-767-6700. Outside of regular business hours, call 410-795-7365 and ask to speak with the epidemiologist on call.

### Case Definition

#### CLINICAL CRITERIA

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

- Parotitis or swelling of other (non-parotid) salivary glands(s) of any duration, OR
- At least one of the following mumps-related complications:
  - Orchitis
  - Oophoritis
  - Aseptic meningitis
  - Encephalitis
  - Hearing loss
  - Mastitis
  - Pancreatitis

## LABORATORY CRITERIA FOR DIAGNOSIS

- Confirmatory Laboratory Evidence:
  - Positive reverse transcriptase polymerase chain reaction (RT-PCR) for mumps-specific nucleic acid<sup>b</sup>, OR
  - Isolation of mumps virus, OR
  - Significant rise (i.e., at least a 4-fold rise in a quantitative titer or seroconversion<sup>c</sup>) in paired acute and convalescent serum mumps immunoglobulin G (IgG) antibody<sup>b</sup>
- Supportive Laboratory Evidence:
  - Positive test for serum mumps immunoglobulin M (IgM) antibody<sup>bd</sup>

**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.

## EPIDEMIOLOGIC LINKAGE

- 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

## CASE CLASSIFICATION

- **Confirmed**
  - Meets confirmatory laboratory evidence
- **Probable**
  - Meets clinical criteria AND epidemiologic linkage criteria, OR
  - Meets supportive laboratory evidence AND
    - Meets clinical criteria of:
      - $\geq$  2-day duration of parotitis or other salivary gland swelling OR
      - a mumps-related complication
- AND
  - Does NOT meet epidemiologic linkage criteria (these are considered sporadic cases)
- **Suspect**
  - Meets the clinical criteria but does not meet laboratory or epidemiologic linkage criteria, OR
  - Meets supportive laboratory evidence but does not meet the clinical criteria AND has documentation that mumps was suspected

Complete a [Mumps Case Report Form](#) for all probable and confirmed cases.

Criteria to distinguish a new case from an existing case can be found in the [Mumps 2024 Case Definition](#).

## Control Measures

### ISOLATION OF CASES

- Patients with confirmed, probable, or suspect mumps should self-isolate for 5 days after the onset of parotitis or other salivary gland swelling, even while lab results are pending or if their lab result is negative (in the absence of a more likely diagnosis or positive lab result for other etiology).
- In patients with lab-confirmed mumps without parotitis, patients should self-isolate for 5 days after the onset of their first symptom (e.g., onset of nonspecific respiratory symptoms, orchitis).
- Cases must be excluded from school, daycare, healthcare facilities, and workplaces. Cases should remain at home and limit exposure to others.
- Suspect or confirmed cases requiring medical attention should notify the healthcare facility prior to arrival so that appropriate precautions can be taken.
- In healthcare settings, use standard and droplet precautions for patients with suspected or confirmed mumps until 5 days after the onset of parotitis

### IDENTIFICATION OF EXPOSED SUSCEPTIBLE CLOSE CONTACTS

- Individuals potentially exposed to the case-patient during the infectious period (from 2 days before through 5 days after onset of parotitis) should be quickly identified.
- A close contact is generally defined as:
  - Having direct contact with the case patient's infectious respiratory secretions by droplet transmission (e.g., kissing, sharing saliva-contaminated objects like water bottles, or being coughed or sneezed on). Droplets generally travel  $\leq 3$  feet when an infected person talks, coughs, or sneezes; OR
  - Being in close proximity for a prolonged period of time with a person infected with mumps during their infectious period (2 days prior, through 5 days after onset of parotitis or other salivary gland swelling)
- For HCP, close contact (or an unprotected exposure) is defined as being within 3 feet of a patient with a diagnosis of mumps without the use of proper personal protective equipment.
- The local health department should work with any involved facilities, such as schools, child care centers, or workplaces, to identify individuals meeting the close contact criteria. In some instances, however, that might be difficult to definitively determine, so broader notification of potentially exposed contacts may be warranted. See Appendix 1 for a sample notification letter.
- All close contacts should be assessed for presumptive evidence of immunity. If the criteria for presumptive evidence of immunity is not met, these individuals should be considered susceptible.

### PRESUMPTIVE EVIDENCE OF IMMUNITY

Presumptive evidence of immunity can be established in any of the following ways\*:

- Written documentation of age-appropriate vaccination with a live mumps virus-containing vaccine:
  - preschool-aged children: 1 dose
  - school-aged children (grades K–12): 2 doses

- adults not at high risk: 1 dose
- Written documentation of two doses of live mumps virus-containing vaccine for school-age children and adults at high risk, including students at post-high school secondary educational institutions, healthcare personnel (HCP), and international travelers
- Laboratory evidence of immunity
- Laboratory confirmation of disease
- Birth before 1957\*

NOTE: Verbal reports of mumps vaccination or infection without written documentation should not be accepted as presumptive evidence of immunity.

\*For unvaccinated healthcare personnel born before 1957 who lack laboratory evidence of mumps immunity or laboratory confirmation of disease, healthcare facilities should consider vaccinating personnel with 2 doses of MMR vaccine at the appropriate interval.

#### **CONTROL MEASURES FOR SUSCEPTIBLE CLOSE CONTACTS**

- Mumps immune globulin is NOT effective as PEP and is no longer manufactured in the U.S.
- Mumps vaccine has not been shown to prevent illness in those already infected, but should be administered to susceptible persons, as it may prevent future infection.
  - Persons who have received only one dose of mumps vaccine previously should get a second dose of mumps vaccine.

#### **EXCLUSION AND SYMPTOM MONITORING OF CLOSE CONTACTS**

- All close contacts should monitor for mumps signs and symptoms for 25 days after the last mumps exposure.
- All close contacts should self-isolate if they develop any symptoms and contact their local health department by phone. If the individual requires an in-person medical evaluation, the healthcare facility should be notified ahead of time. Symptomatic contacts must be excluded from school, childcare, healthcare facilities, and workplaces until evaluated further. Note that previously vaccinated individuals may have a modified disease presentation.
- Asymptomatic close contacts who demonstrate presumptive evidence of immunity do not need to be excluded.
- Close contacts lacking presumptive evidence of immunity must be excluded from school, childcare, and workplaces from 12 days after the first exposure to a case-patient during the case-patient's infectious period through the 25th day after the last exposure to an infectious case (CCDM 21st Edition). They should also avoid settings where they could come into contact with a large number of individuals (e.g., grocery or retail stores, public transportation) or individuals who may be susceptible to mumps and/or at high risk (e.g. visiting healthcare facilities). This recommendation includes homes as well – e.g., they should not host large gatherings in the house during this time. If there are susceptible or high-risk household contacts, precautions should be taken to prevent exposure to them.
  - Close contacts who are healthcare personnel and lack presumptive evidence of immunity must be excluded from work from the 10th day after their first exposure through the 25th day after their last exposure ([CDC Mumps Infection Control](#)).

## **Outbreaks**

An outbreak is defined as 2 or more epidemiologically linked cases occurring within a 25-day period, AND at least one case is laboratory confirmed. During a mumps outbreak, follow the investigation steps and control measures for each identified case. Further response measures (e.g., facility-wide or public communications, additional vaccination, and exclusion recommendations) will be considered on a case-by-case basis.

## References

1. American Academy of Pediatrics. Mumps. In: Red Book: 2024-2027 Report of the Committee on Infectious Diseases. 33rd Edition. Available at <https://publications.aap.org/redbook/book/755/chapter/14079725/Mumps?searchresult>
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3. Centers for Disease Control and Prevention. Chapter 15: Mumps. Epidemiology and Prevention of Vaccine Preventable Diseases. 14th Edition. 2021. Available at <https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-15-mumps.html>.
4. Centers for Disease Control and Prevention. Chapter 9: Mumps. Manual for the Surveillance of Vaccine Preventable Diseases. 2023. Available at <https://www.cdc.gov/surv-manual/php/table-of-contents/chapter-9-mumps.html>.
5. Centers for Disease Control and Prevention. Recommendation of the Advisory Committee on Immunization Practices for Use of a Third Dose of Mumps Virus-Containing Vaccine in Persons at Increased Risk for Mumps During an Outbreak. Morbidity and Mortality Weekly Report, January 12, 2018 / 67(1);33–38. Available at <https://www.cdc.gov/mmwr/volumes/67/wr/mm6701a7.htm>.
6. Heymann, David L., [ed.]. Control of Communicable Diseases Manual, 21st Edition. Washington, D.C.: American Public Health Association, 2022.

## **Appendix 1- Sample Mumps General Notification Letter of Potential Exposure**

Letterhead of LHD or Facility

Date

Dear Parent/Guardian/Staff,

We are sending this letter to make you aware that a case of mumps has been reported in our community.

Mumps is a contagious disease that often begins with parotitis or swelling of the salivary glands on one or both sides of the neck area. Fever and headache may also occur. Symptoms may first be noticed as an earache. The swelling usually appears 16-18 days after a person is exposed.

Mumps is spread when an infected person coughs or sneezes, or shares food/drinks. A person with mumps can spread the disease from 2 days before the swelling appears until 5 days after the swelling appears.

Persons suspected of having mumps will be excluded from school/daycare/work for 5 days after the swelling appears. Exposed unvaccinated students and staff should receive a dose of vaccine as soon as possible. Those unvaccinated students and staff who receive a mumps-containing vaccine will be allowed back to school immediately. Students and staff who do not have evidence of immunity to mumps will be excluded beginning the 12th day after the first exposure to an individual with mumps while they were infectious. Exclusion from school for these contacts will continue through 25 days after their last exposure to an infectious mumps case.

Mumps can be prevented with appropriate vaccination. Please check with your health care provider to make sure your/your child's shots are up to date.

Attached is a Mumps Fact Sheet. If you/your child experience(s) mumps symptoms during the next several weeks, please contact your healthcare provider and let them know about a possible exposure to mumps before going into the office to be evaluated. If you/your child has been seen by a healthcare provider and been diagnosed with mumps, please notify us and stay home.

If you or your healthcare provider has any questions, please contact (POC at facility/school/daycare) at (###-###-####) or the (local health department name) at (###-###-####).

Sincerely,

Name of Facility/School/Childcare and LHD