Mumps

DISEASE REPORTABLE WITHIN 24 HOURS OF DIAGNOSIS

Per New Jersey Administrative Code (N.J.A.C.) 8:57, healthcare providers and administrators shall report within 24 hours of varicella diagnosis to the health officer of the jurisdiction where the ill or infected person lives, or if unknown, wherein the diagnosis is made.

Directory of Local Health Departments in New Jersey and Directory of After Hour Emergency Contact Phone Numbers for Local Health Departments in New Jersey both available at:
https://www.nj.gov/health/lh/community/index.shtml

If the health officer is unavailable, the healthcare provider or administrator shall make the report to the Department by telephone to 609.826.5964, between 8:00 A.M. and 5:00 P.M. on non-holiday weekdays or to 609.392.2020 during all other days and hours.

NJHealth
New Jersey Department of Health
Communicable Disease Service

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1 THE DISEASE AND ITS EPIDEMIOLOGY

I. Etiologic Agent

Mumps is caused by a ribonucleic acid (RNA) virus, a member of the Paramyxoviridae family and genus *Rubulavirus*. Mumps is antigenically related to the parainfluenza virus, meaning both virus's antigens are closely related, and antibodies produced in response to one, will likely recognize antigens from the other.

II. Clinical Description

Mumps is a contagious, systemic disease most often characterized by swelling of the salivary glands (parotitis), located in the cheek and jaw area. Fever, headache, muscle aches, tiredness, and loss of appetite may precede parotitis by several days. Parotitis occurs in 30%-65% of infected persons. Approximately 20% of infections among unvaccinated people are asymptomatic, and therefore do not know they were infected with mumps.

Infection in adulthood is more likely to result in complications, including mastitis and oophoritis[1] and orchitis[2]. Mastitis and oophoritis has been reported in 7% and 30% respectively in unvaccinated female mumps patients aged 15 years and older, and less than 1% in vaccinated female mumps patients. Orchitis is the most common complication in post-pubertal males, occurring in 30% of unvaccinated and 6% of vaccinated males. Approximately half of patients with orchitis develop testicular atrophy. Encephalitis and meningitis are rare, as are permanent sequelae or death. Other rare complications include arthritis, renal involvement, myocarditis, cerebellar ataxia, pancreatitis, and hearing impairment. Although, mumps infection during the first trimester of pregnancy may increase the risk of spontaneous abortion, there is no evidence that mumps during pregnancy causes congenital malformations. Death due to mumps is rare.

NOTE: Parotitis can also be caused by parainfluenza virus types 1 and 3, influenza A, Epstein-Barr virus, coxsackieviruses and other enteroviruses, lymphocytic choriomeningitis virus, human immunodeficiency virus (HIV), Staphylococcus aureus, nontuberculosis mycobacterium, and, less often, other gram-positive and gram-negative bacteria; salivary duct calculi; starch ingestion; drug reactions (e.g., phenylbutazone, thiouracil, iodides); and metabolic disorders (diabetes mellitus, cirrhosis, and malnutrition). Only mumps causes epidemic parotitis.

III. Reservoirs

Humans are the only host. Although asymptomatic persons can transmit the virus, no carrier state is known to exist.

[1] Inflammation of the breasts and ovaries
[2] Testicular inflammation

IV. Modes of Transmission

Mumps is spread by direct contact with infected respiratory secretions or saliva or through fomites. The latter is rare and should not be a parameter for determining exposure especially in a school setting.

V. Incubation Period

The incubation period is usually 16 to 18 days, with a range of 12 to 25 days.

VI. Period of Communicability or Infectious Period

Maximum infectiousness occurs from two days before to five days after parotitis onset. The virus has been isolated from saliva from seven days before through nine days after parotitis onset. The initial day of swelling should be counted as day zero. Mumps infectiousness is similar to influenza and rubella but is not as contagious as measles or chickenpox.

Calculating the Infectious Period

Onset date of parotitis: _____/_____/_____

Infectious Period: _____/_____/_____ (Two days before onset of parotitis) **TO** _____/_____/_____ (Five days after onset of parotitis)

VII. Epidemiology

Mumps occurs worldwide and in the United States (U.S.) it is endemic year-round, peaking in winter and spring. Most adults born in the U.S. before 1957 are considered immune because they have likely been exposed to mumps prior to vaccinations being available. Mumps can also occur in individuals from other countries where mumps vaccine is not given routinely.

Before the U.S. mumps vaccination program started in 1967, about 186,000 cases were reported each year. The disease caused complications, such as permanent deafness in children, and occasionally, encephalitis, which could rarely result in death. After implementation of the two dose MMR vaccine, there was a 99% decrease in mumps cases in the U.S., with just a few hundred cases reported each year by the early 2000s. From 2000-2005, there were fewer than 300 cases of mumps reported annually in the U.S. Since then, there has been an increase in the number of reported mumps cases with peak years in 2006, 2016-2017, and 2019. The majority of cases and outbreaks during these peak years occurred among people who were fully vaccinated and in close-contact or congregate settings.

VIII. Vaccine Recommendations

Vaccination is the best way to prevent mumps and mumps complications. This vaccine is included in the combination measles-mumps-rubella (MMR) and measles-mumps-rubella-varicella (MMRV) vaccines. Two doses of mumps vaccine are 88% (range 32% to 95%) effective at preventing the disease; one dose is 78% (range 49% to 91%) effective. Routine childhood vaccinations schedule is as follows:

- 1st dose administered at age 12–15 months
- 2nd dose administered at age 4–6 years

The 2nd dose can be given before 4 years of age provided at least 28 days have elapsed since the first dose. For more information regarding vaccinations in response to case investigation or an outbreak, refer to sections 6 & 7 below. In accordance with N.J.A.C. 8:57-4, Immunization of Pupils in School, New Jersey requires one dose of MMR vaccine for licensed childcare/preschool and two doses for school attendance. Please check the most recent NJ immunization regulations regarding varicella dose requirements.

2 CASE DEFINITION

The NJDOH Communicable Disease Service (CDS) follows the most current case definition as published on the Centers for Disease Control's (CDC) National Notifiable Disease Surveillance System (NNDSS) website. For the most recent case definition please visit: https://ndc.services.cdc.gov/conditions/mumps/

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):
  - Orchitis
  - Oophoritis
  - Aseptic meningitis
  - Encephalitis
  - Hearing loss
  - Mastitis
  - Pancreatitis

Laboratory Criteria

Confirmatory Laboratory Evidence:*

- Positive reverse transcriptase polymerase chain reaction (RT-PCR) for mumps-specific nucleic acid, **OR**
- Isolation of mumps virus, **OR**
- Significant rise (i.e., at least a 4-fold rise in a quantitative titer or seroconversion) in paired acute and convalescent serum mumps immunoglobulin G (IgG) antibody.

Supportive Laboratory Evidence:

- Positive test for serum mumps immunoglobulin M (IgM) antibody

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

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.

Case classification (current as of 2024)

Confirmed:

- Meets confirmatory laboratory evidence.

Probable:

- Meets clinical criteria **AND** epidemiologic linkage criteria, **OR**
- Meets supportive laboratory evidence **AND**
  - Meets clinical criteria of:
    - ≥2-day duration of parotitis or other salivary gland swelling **OR**
    - a mumps-related complication

  AND
  - Does NOT meet epidemiologic linkage criteria (i.e., 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.

3 LABORATORY TESTING

Any person with clinical features compatible with mumps should be tested. Clinical diagnosis of mumps may be unreliable, so suspected cases of mumps should be laboratory confirmed. Specimens should be collected from patients with clinical features compatible with mumps as soon as possible after onset of symptoms. In addition, ensure proper specimen collection, storage, and transport.

The NJDOH Public Health Environmental Laboratories (PHEL) does not perform routine laboratory testing for mumps virus. Testing is usually conducted through private commercial laboratories. Commercial laboratories have different testing capabilities based on specimen type; carefully check both the specimen type and the specific test to be requested.

For additional information and laboratory guidance refer to CDC https://www.cdc.gov/mumps/php/laboratories/specimen-collection.html and NJDOH guidance: https://www.nj.gov/health/cd/topics/mumps.shtml

I. Viral Testing

The virus can be confirmed by reverse transcription polymerase chain reaction (RT-PCR), or by isolation of mumps virus from a clinical specimen. PCR testing is widely available and preferred because results are generally available within 3 days. Culture results have limited clinical usefulness since results may take up to 4 weeks.

Buccal[3] swabs in viral transport medium are the preferred specimen for PCR testing for mumps and should be collected as soon as mumps is suspected (preferably within 3 days of parotitis onset and up to 8 days after parotitis onset) for the best chance of detection of

[3] Relating to the cheek

virus. Buccal swabs are most commonly used for RT-PCR testing, but urine and cerebral spinal fluid (CSF) may also be used in specific situations.

II. Serological Testing

Serologic tests should be interpreted with caution because vaccination status and timing of specimen collection can affect results and both false-positive and false-negative results have been observed. Here are some things to consider:

- Interpretation of serology tests for mumps depends on the time of specimen collection relative to symptom onset and on the immunization history of the individual.
- Regardless of vaccination status, parainfluenza viruses 1, 2, and 3, Epstein-Barr virus, adenovirus, and human herpesvirus 6 have all been noted to interfere with mumps serologic assays, leading to false-positives.
- A person who has previously been vaccinated against mumps or previously had mumps and who is being evaluated for the disease may not have a conventional serologic response.
    - While IgM may indicate acute disease, in vaccinated individuals, IgM may be undetectable (it may be altogether absent, delayed, or transient)
    - Can also see false positive IgMs in vaccinated individuals for a variety of reasons.
- PCR is the preferred method of confirmation and should be considered in addition to or instead of serology.

NOTE: Failure to detect mumps virus RNA by RT-PCR or to detect IgM in serum in samples from a person with clinically compatible mumps does not rule out mumps as a diagnosis.

4 DISEASE REPORTING REQUIREMENTS

I. Purpose of Surveillance and Reporting

- To promptly identify cases and susceptible exposed people rapidly and to prevent further spread of disease
- To promptly identify clusters or outbreaks and initiate appropriate prevention and control measures
- To follow disease trends in the population
- To confirm mumps infection as the cause of parotitis
- To distinguish between failure to vaccinate and vaccine failure and address the problem

- To assess progress towards disease reduction goals
- To characterize populations requiring disease control measures

II. Laboratory Reporting Requirements

The NJAC 8:57-1 stipulates that laboratories **report within 24 hours**, by telephone, any positive culture, test, or assay result specific to mumps to the LHD where the patient resides. If the laboratory director or their designee is unable to reach the LHD where the patient resides, they should report the result to NJDOH CDS at 609.826.5964 (nonholiday weekdays between 8 A.M. and 5 P.M.) or 609.392.2020 (nights/weekends/holidays). Please refer to the lists of reportable diseases (http://www.nj.gov/health/cd/documents/reportable_diseases.pdf) for information.

III. Healthcare Provider Reporting Requirements

Per NJAC 8:57-1, any healthcare provider shall report by telephone confirmed or suspect cases of mumps within 24 hours to the LHD where the patient resides. If the health officer is unavailable, the report shall be made to NJDOH CDS.

IV. Health Officer Reporting and Follow-up Responsibilities

As specified at NJAC 8:57-1 each local health officer notified of mumps must report the occurrence of any case or outbreak of mumps to NJDOH CDS within 24 hours of receiving the report. The health officer shall within 24 hours of receipt of a report initiate or update the information on the Communicable Disease Reporting and Surveillance System (CDRSS). If the initial report is incomplete, a health officer shall seek complete information and provide all available information to NJDOH CDS within 5 days of receiving the initial report.

5 CASE INVESTIGATION

I. Objectives of the investigation

The primary objective of the case investigation is to ensure that susceptible and high-risk susceptible close contacts of the case are identified and referred to their healthcare provider for vaccination or quarantined, if appropriate, to prevent further spread of illness.

A second objective of the case investigation is to document information obtained and actions taken. Thorough and timely documentation in CDRSS will facilitate communication between disease investigators and assist with public health surveillance. Refer to section II D, below, for specific information on filing the report in CDRSS.

Case investigations typically include review of laboratory, medical, and immunization records, as well as interviewing the medical provider to obtain information about clinical presentation and impression. Investigations also include interviews of cases, or their guardian, which are necessary to verify onset dates, symptoms, and to identify sources of infection and contacts at risk.

II. Investigation guidelines

A. Verify mumps diagnosis

Many mumps cases are created from electronic lab reporting, information from the provider and patient is necessary to determine why provider ordered test and if patient was symptomatic or asymptomatic.

- If asymptomatic and test was ordered for specific purpose of checking immunity (no clinical suspicion of mumps), case can be closed as not a case.
- If symptomatic, obtain clinical presentation and onset date, recommend viral testing if appropriate, and inquire if other diagnoses are being considered as non-epidemic parotitis can be due to other causes such as flu and dental issues.

B. Identify close contacts

Contacts should be identified starting 2 days prior to parotitis onset through 5 days after parotitis onset. Refer to section 6 for more information.

C. Disease control measures

Institution of disease control measures is an integral part of case investigation. Please consult with NJDOH before recommending quarantine or exclusions. It is the local health officer's responsibility to understand and institute control guidelines listed below in section 6.

D. Entry into CDRSS

It is the health officer's responsibility to investigate the case by interviewing the patient and others who may be able to provide pertinent information. Following notification, the local health officer shall update the case in CDRSS. Use the following checklist to accurately record all information required for case close out.

Section	Required Information
Disease Information	☐ Select "MUMPS" as Disease ☐ Illness onset date **NOTE:** There are no subgroups for mumps.
Patient Info	☐ At minimum, document/verify the patient's name, date of birth, gender, race/ethnicity, home address, and telephone number **NOTE:** Include additional/preferred contact information if available.
Addresses	☐ Patient's address ☐ Enter any alternate addresses relevant to case investigation (e.g., daycare, school, work, or other residences address). **NOTE**: Entering an alternate address will allow other disease investigators access to the case if the alternate address falls within their jurisdiction.

Section	Required Information
Laboratory Information	☐ Indicate appropriate test(s) ☐ Specimen collection date ☐ Specimen type ☐ Test result with values and reference ranges ☐ Ordering provider and ordering facility
Comments	Information entered in the comments section CANNOT be automatically exported when generating reports. Therefore, record information about the case in the fields that have been designated to capture this information.
Outbreak Information	If case is associated with an outbreak: ☐ Select E or I number created by NJDOH ☐ Exposure setting ☐ Case role ☐ Outbreak case classification
Clinical Status	☐ Illness onset date ☐ Hospitalization ☐ Mortality (“Patient Died’) ☐ Date of death (If applicable)
Contact Tracing	Information regarding contacts is required for mumps including information on any household and other close contacts. ☐ Indicate if patient is epi-linked to a confirmed case ☐ Identify exposed contacts ☐ Any close contacts who develop symptoms during the incubation period should have their own case created and investigated ☐ Any additional cases identified as epi-linked should have a case created and should be linked to index case.
Epidemiology	☐ Select “DROPLET” as route of transmission ☐ Transmission setting ☐ Method of import ☐ Method of case detection ☐ Patient’s role (Daycare, school, work)

Section	Required Information
Immunization Information	☐ Did patient ever receive vaccine(s) for this disease? Check appropriate response. ☐ Dates of mumps immunization(s) ☐ Dose number in series ☐ NJIIS ID ☐ Reason not vaccinated
Medical Facility & Provider	☐ Record the medical facilities and provider(s) involved in the patient's care, including contact information. ☐ Dates of hospitalization (if applicable) ☐ Medical record number ☐ Patient status
Risk Factors	Enter complete information about risk factors to facilitate study of mumps disease in New Jersey. ☐ Association with day care/childcare. Describe association. ☐ Vaccination status. Include reason for status ☐ Recent history of travel (to where and dates) ☐ Communal living. Specify type of communal living.
Signs/Symptoms	☐ Does patient have parotitis? ☐ Indicate unilateral vs bilateral ☐ Select duration of parotitis in days ☐ Complete other signs and symptoms (or indicate if asymptomatic) ☐ Indicate onset date(s) ☐ Enter the resolution date of signs and symptoms
Case Classification	☐ Select appropriate case classification (See section 2 B for additional information). • All cases entered by laboratories should be assigned a case status of "REPORT UNDER INVESTIGATION (RUI)." • Cases still under investigation by the LHD should be assigned a case status of "REPORT UNDER INVESTIGATION (RUI)." • Upon completion of the investigation, the LHD should assign a case status based on the case definition.

Section	Required Information
Report Status	☐ Select appropriate report status • Cases reported by laboratories should be assigned a report status of "PENDING." • Once the LHD begins investigating a case, the report status should be changed to "LHD OPEN." • The "LHD REVIEW" option can be used if the LHD has a person who reviews the case before it is closed (e.g., health officer or director of nursing). • Once the LHD investigation is complete and all the data are entered into CDRSS, the LHD should change the report status to "LHD CLOSED." • "LHD CLOSED" cases will be reviewed by NJDOH. If additional information is needed on a particular case, the report status will be changed to "REOPENED". Cases that are "DHSS APPROVED" cannot be edited by LHD staff. • If a case is inappropriately entered (e.g., a case of measles was erroneously entered as a case of mumps) the case should be assigned a report status of "DELETE." A report status of "DELETE" should NOT be used if a reported case of mumps simply does not meet case definition. Rather, it should be assigned the appropriate case status, as described above.

6 CONTROLLING FURTHER SPREAD

I. Isolation and Quarantine Requirements (NJAC-8:57-1)

NJDOH CDS should be notified for consultation and approval before any institutional, exclusion, or community-wide outbreak control measures are planned or implemented. Generally, outbreak control measures are not necessary in response to a sporadic case.

A. Minimum Period of Isolation of Patient

Through five days after onset of parotid gland swelling.

B. Minimum Period of Quarantine of Contacts

Quarantine is not routinely recommended for close contacts of sporadic mumps cases except in outbreak and healthcare settings. Healthcare personnel without evidence of immunity should be furloughed from day 10 through day 25 from last exposure. Day of exposure is day 0.

II. Protection of Contacts of a Case

A. Identify exposed close contacts starting 2 days prior through 5 days after onset of parotitis in a person infected with mumps. Close contact is defined as:

- having direct contact with a mumps patient's infectious respiratory secretions (e.g., kissing, sharing drinks, being coughed/ sneezed on), OR
- being in close proximity for a prolonged period of time

Additional examples of intense close contact exposures include physical contact, such as attendance at a crowded party, or during dancing, contact sports, sexual activity and sharing of gym equipment or drinks such as water bottles. Examples of frequent close contact exposures include prolonged contact such as living in confined or shared spaces; repeated contact such as meeting regularly or sharing daily habits.

B. Regardless of whether a close contact has prior evidence of immunity, all contacts should be notified of exposure and advised that they may develop mumps and should monitor for signs and symptoms for 25 days since last exposure. If considering widespread notification, consult with NJDOH CDS prior to distribution.

Acceptable presumptive evidence of immunity is defined in the box below:

Acceptable Presumptive Evidence of Immunity

1. Documentation of age-appropriate vaccination with a live mumps virus-containing vaccine:
    - Preschool-aged children: 1 dose
    - Children grades K-12: 2 doses
    - Adults NOT at high risk: 1 dose
    - High risk individuals*: 2 doses, **OR**
2. Laboratory evidence of immunity (IgG), **OR**
3. Laboratory confirmation of disease, **OR**
4. Born before 1957 (Excluding healthcare workers)

***** Individuals at high risk include students in post-high school educational institutions, healthcare personnel, and international travelers.

C. There is no available postexposure prophylaxis for mumps. Neither mumps containing vaccine nor immune globulin (IG) is effective in preventing or decreasing the severity of infection if administered after exposure.

D. Follow-up with exposed contacts after 25 days (one incubation period) from last exposure to ensure no one else became ill.

- People without evidence of immunity should be referred to their medical provider to receive MMR vaccine because immunization will provide protection against subsequent exposures.

III. Managing Special Situations

A. Mumps in Healthcare Settings

1. Isolation of patients: Patients suspected of mumps infection should be placed on droplet precautions, in addition to standard precautions, through five days after onset of parotid swelling (counting the day of onset as day zero). They may be taken off precautions on the sixth day.

2. Healthcare personnel[4] with mumps should be excluded from the healthcare setting for 5 days after the onset of parotitis.

3. Proof of immunity for healthcare personnel: Although birth before 1957 is generally considered acceptable evidence of immunity to mumps, healthcare personnel of any age are not considered immune unless they have had 2 immunizations separated by at least 28 days. An effective routine MMR vaccination program for healthcare personnel (in addition to standard precautions) is the best approach to prevent nosocomial transmission.

4. Identify any exposed healthcare personnel, assess appropriate use of personal protective equipment (PPE) and immune status. Exposures in a healthcare setting are defined as being within 3 feet of a patient with a diagnosis of mumps without the use of appropriate PPE. Protected exposures do require further action. For those healthcare personnel with unprotected exposures follow the below guidance:

   - Without acceptable presumptive evidence of immunity: Should be excluded from performing duties within any healthcare setting from the 10th day after the first unprotected exposure to mumps through the 25th day after the last exposure. Healthcare personnel who receive their first dose after an exposure are still required to be excluded for the full timeframe.
   - With partial vaccination: May continue working following an unprotected exposure to mumps. Such personnel should receive a second dose as soon as possible, but no sooner than 28 days after the first dose. They should be educated about symptoms of mumps, including nonspecific presentations, and should notify occupational health if they develop these symptoms.
   - With evidence of presumptive immunity: Do not need to be excluded from work following an exposure

   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.

5. Surveillance: Conduct active surveillance for mumps for 25 days after last exposure of parotitis in non-outbreak situations.

B. Mumps in College and University Settings

[4] refers to all paid and unpaid persons serving in healthcare settings who have the potential for direct or indirect exposure to patients or infectious materials

College and university campuses are common settings for mumps outbreaks and have experienced some of the largest mumps outbreaks since 2006. many outbreaks on campuses are limited to specific group(s) of students at increased risk for mumps (e.g., sports teams, fraternities, and sororities). In these outbreaks, a third dose might only be recommended to students in those groups and not to the entire college or university student population. A third dose might be recommended to all students if cases are rapidly increasing, and it becomes challenging to find links or identify groups at increased risk to target vaccination. The advisory Committee on Immunization Practices (ACIP) currently recommends two doses of MMR vaccine for routine vaccination; there is no current recommendation for routine vaccination with a third dose.

The American College Health Association (ACHA), with assistance from CDC, developed a toolkit to assist colleges and universities in providing accurate and engaging information to students regarding mumps and MMR vaccine during outbreaks. The toolkit includes social media images, infographics, and talking points for university administration. https://www.acha.org/mumpsToolkit

C. Mumps in Correctional and Detention Facility Settings

Correctional and detention facilities are considered settings with a high likelihood of transmission during a mumps outbreak.

Public health officials and the facility owner, operator, health services, and other contract employers should work together to develop appropriate control measures based on local epidemiology and the specific needs of each facility. Effective public health interventions require understanding of facility and custody operations, which may involve frequent transfers of detainees (between facilities and states) and multiple entities with authority for operations and inmate/detainee custody.

Refer to CDC's guidance on responding to mumps outbreaks in correctional facilities: Mumps Outbreak Control in Detention Facilities

7 OUTBREAK SITUATIONS

A mumps outbreak is defined as 3 or more cases linked by time and place. Once an outbreak is declared, please work in collaboration with NJDOH. Mumps outbreak investigation and control generally consists of several steps, some of which may occur in parallel. Some steps to investigate mumps outbreaks include:

- Investigate and confirm suspected mumps
  - Generally, lab confirmation is necessary before confirming an outbreak
- Identify groups of people who might have close contact with a mumps patient
  - A group's setting could be at a location such as a church or school, during an activity such as sports practice, or at an event such as a party.
- Investigate the setting to determine if a group is at increased risk for acquiring mumps

  - Is there evidence that transmission occurred or has continued to occur within the group's setting

- Recommend MMR vaccination for groups at increased risk
  - Everyone who is determined to be part of the group at increased risk for getting mumps should receive a dose of MMR vaccine, regardless of if they have documentation of age-appropriate vaccination or other form of presumptive evidence of immunity.
  - In October 2017, the Advisory Committee on Immunization Practices (ACIP) recommended a third dose of a MMR vaccine
- Consider exclusion of unvaccinated people in the group at increased risk from the setting for 25 days since last exposure
  - In school settings, once student receives first dose, they can be readmitted to school
  - If exclusions are implemented, people who have a history of 1 dose of MMR vaccine do not need to be excluded but it is recommended they receive their 2nd vaccine dose.
  - In schools and universities, exclusion includes unvaccinated students without other prior evidence of immunity who have exemptions for medical, religious, or other reasons.
- Conduct active surveillance for mumps for two incubation periods (50 days) after onset of the last case.
- Raise public and provider awareness

For additional information on mumps outbreak response refer to: https://www.cdc.gov/mumps/php/public-health-strategy/index.html

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