

MUMPS

TRANSMISSION

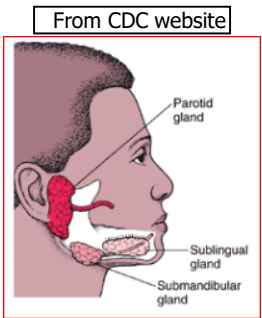
Source
Humans only
Respiratory droplets or saliva

Transmission:
--Droplet: large droplet
--Direct contact: with respiratory secretions
--Fomites: Article freshly soiled with nasal or throat secretion, sharing drink or utensils

Attack rate:
--Household = 50%
--Schools = 5%-20%

Incubation Period
16-18 days
Extreme 12-25

Swelling of Salivary Gland
Parotitis - peak 1-3 days, longest 10 days
bilateral 75%, unilateral 25%
Fever 3-4 days
Myalgia, anorexia, headache



Communicability:
2 days before to 5 days after swelling onset

20% Asymptomatic
50% Parotitis, less frequent submandibular, or sublingual
15% some CNS infection, meningitis
2% Pancreatitis
10% Orchitis, oophoritis post puberty

Exclusions:
--Children in school (Swelling onset + 5 days)
--HCW (Swelling onset +5 days)
--HCW exposed (Exp +12 days to +26 days)

Ig M from onset + 2 days to several months, may be absent early in vaccinated or naturally infected
Ig G Appears 7 days after rash and stays for rest of the life

DIAGNOSIS

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, or Aseptic meningitis, or Encephalitis, or Hearing loss, or Orchitis, or Oophoritis, or Mastitis, or Pancreatitis

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 defined by PH during an outbreak of mumps.

Clinical Differential
Characteristic of mumps parotid swelling:
1-Angle of the jawbone no longer visible
2-Jaw bone cannot be felt
3-Protrusion of ear
Characteristic of lymph node swelling:
1-Well defined border
2-Behind angle of jawbone
3-No protrusion of ear

Viral Differential
Parainfluenzae 1 & 3
Influenza A
Coxsackie A
Echo
LCM
Neck lymph node swelling

Laboratory Criteria for Diagnosis of confirmed case: Best if collected 1-3 days after onset
• **Detection of mumps nucleic acid (e.g., standard or real time RT-PCR assay on nasopharyngeal swab, salivary gland duct*, throat).** *Best after 30 second massage of salivary gland. **Urine** for orchitis, **CSF** for viral meningitis.
• Virus isolation from clinical specimen (Saliva; rarely done)

Laboratory instructions for identification of Mumps Virus by PCR and Genotyping:
-**Collection:** buccal, nasopharyngeal or throat swab, 250µL,
-**Swab:** Synthetic swab stored in 2mL viral transport media at 4°C if shipping within 24 hours.
-**Ship** on cold packs. If shipping is delayed, freeze at -70°C. Ship frozen,
-**Results:** PCR: 2 business days, Genotyping:10 business days

For IgM EIA more specific than IFA because of interference of high IgG. EIA and IFA not approved by FDA, validated by each lab
IgG PRNT available

Serum positive for IgM or Rising Ig G in paired acute and convalescent serum specimen. EIA IgG values are not titers, increase in values do not correspond to titer increases. In vaccinated IgG may be elevated as acute and increase may not be evident. Antibodies are not good diagnostic tools among immunized persons, IgG are expected in a patient who has been immunized, IgM may last long after immunization

Mumps Exposure	IgM	IgG	Comments
Unvaccinated, no mumps history	+	+ or -	IgM detectable for weeks to months; low levels of IgG may be present at symptom onset
1-dose vaccine history	+or-	+	50% of serum collected 1–10 days after symptom onset were IgM-positive; 50%-80% of serum collected >10 days after symptom onset were IgM-positive
2-dose vaccine history	+or-	+	13%–15% of serum samples collected 1–3 days after symptom onset were IgM-positive

CONTROL, OUTBREAK INVESTIGATION

CASE INVESTIGATION

- Report case to OPH within 24 hours.
- Keep case out of school/group for 9 days after swelling appears.
- See Outbreak investigation below

OUTBREAK INVESTIGATION

- OUTBREAK =3 or more cases linked by time & place
- Outbreak setting: populations in high transmission settings (elementary, middle and high schools, colleges, camps. Even if high proportion of vaccinated
- Early intervention reduce magnitude of outbreak
- Report to OPH within 1 business day; In case of an outbreak report cases as immediately
- MAIN GOAL: Identify population at risk and transmission settings and vaccinate those without immunity
- Persons at high risk are: unvaccinated, single dose recipient, close oral contact...
- Third dose of MMR for person at increased risk of infection even if properly vaccinated (ACIP Oct 2017). If already infected, 3rd dose will not prevent disease but will prevent infection in those not yet exposed or infected (CDC)
- Strict segregation of cases
- Exclusion of susceptible persons up to 26 days after onset of the last person with mumps for person with no vaccines, persons exempted for medical, religious and other reasons may be considered (CDC)
- Institutional outbreak: Vaccine or immunoglobulin to new admissions.
- Healthcare facility: Professionals in contact with the patients should be immunized (MMR)
- Search for and immunization of exposed susceptible should be carried out.

Prevention and control strategies in healthcare settings (In-patients, outpatients, LTCF)

- Assessment of presumptive evidence of immunity of healthcare personnel, including documented administration of 2 doses of MMR, laboratory evidence of immunity or laboratory confirmation of disease, or birth before 1957 vaccination of those without evidence of immunity;
- Exclusion of healthcare personnel with active mumps illness, healthcare personnel who do not have presumptive evidence of immunity who are exposed to persons with mumps;
- Isolation of patients in whom mumps is suspected; and
- Implementation of droplet precautions, in addition to standard precautions.
- Healthcare Infection Control Practices Advisory Committee (HICPAC) and CDC recommend secure, computerized, systems to be used to manage vaccination records for HCP for easy retrieval.
- Facilities should review employee evidence of immunity status for mumps and other vaccine preventable infections and should provide MMR vaccine to all personnel without evidence immunity at no charge.

Healthcare personnel (HCP): presumptive evidence of immunity

- Presumptive evidence of immunity criteria for HCP differs slightly from the criteria for community settings. Criteria to assess presumptive evidence of immunity among healthcare personnel.
- Written documentation of vaccination with 2 doses of live mumps or MMR vaccine administered at least 28 days apart
 - Laboratory evidence of immunity
 - Laboratory confirmation of disease
 - Birth before 1957

Management of healthcare personnel with illness due to mumps

Consider mumps diagnosis in exposed HCP who develop non-specific respiratory infection symptoms during the incubation period after unprotected exposures to mumps, even in the absence of parotitis. HCP with mumps illness should be excluded for 5 days after the onset of parotitis.

Management of healthcare personnel who are exposed to persons with mumps

Unprotected exposures = being within 3 feet of a patient with a diagnosis of mumps without the use of proper PPE. Irrespective of immune status, all exposed HCP should report any symptoms during the incubation period, from day 12 to day 25 after exposure.

For HCP who do not have acceptable presumptive evidence of immunity:

- HCP without evidence of immunity should be excluded from the 12th day after the first unprotected exposure to mumps through the 25th day after the last exposure.
- Previously unvaccinated HCP who receive a first dose of vaccine after an exposure are considered non-immune and should be excluded from day 12 after exposure to day 25 after last exposure. The mumps vaccine cannot be used to prevent the development of mumps after exposure.

For HCP with partial vaccination: previously vaccinated for mumps with only 1 MMR may continue working following an unprotected exposure to mumps. Administer a second dose ASAP, but no sooner than 28 days after first dose. Notify occupational health if they develop symptoms.

For HCP who have presumptive evidence of immunity: do not need to be excluded from work following an unprotected exposure. Some vaccinated personnel may remain at risk for mumps and steps should be taken to reduce the risk of infection. So HCP should notify occupational health if they develop these symptoms.

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

<http://www.infectiousdisease.dhh.louisiana.gov>

VACCINE RECOMMENDATION

Childhood Vaccine

- No monovalent vaccine
- Two MMR vaccine (at least 1 month apart)
- Recommended age:
 - 1st dose at 12-15 months
 - 2nd dose at 4-6 years
- OR MMRV at 12mos-12yrs but 1/2500 seizure risk

1 dose
78%

2 doses
88%

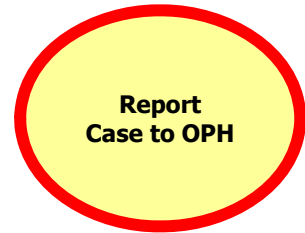
Adult born 1957 or after

- High risk: (post High school, college, International travel, Healthcare work: Two MMR
- Others: One MMR
- Outbreak**
- One additional MMR

PRESUMED IMMUNE

- MMR after 12mos, written doc
- Lab evidence of immunity
- Birth before 1957

Treatment: Supportive



Contact investigations for in-flight transmission of mumps of any duration, showed the risk was low



→ NO contact investigations for mumps on flights.

Prophylaxis of the exposed:

- Vaccination within 72 hours of exposure
- Immunoglobulin within 6 days of exposure
- Household contacts
- Healthcare facility contacts
- Institutional contacts (Child daycare center, School)

Live vaccine in 72 hr
Immunoglobulin if live vaccine is contraindicated -----

- Children < 1-year age
- Pregnant women
- Immunocompromised person