Ministry of Health and Long-Term Care

Infectious Diseases Protocol

Appendix B: Provincial Case Definitions for Diseases of Public Health Significance

Disease: Mumps

Effective: February 2019

Ontario

Mumps

1.0 Provincial Reporting

Confirmed and probable cases of disease

2.0 Type of Surveillance

Case-by-case

3.0 Case Classification

3.1 Confirmed Case

Laboratory confirmation of infection with clinically compatible signs and symptoms (see Section 5.0) in the absence of recent history of immunization with a mumps-containing vaccine[*]:

- Isolation of mumps virus from an appropriate clinical specimen (e.g. buccal swab, throat swab and urine specimen)
  OR
- Detection of mumps virus ribonucleic acid (RNA) from an appropriate clinical specimen (refer to above)
  OR
- Mumps immunoglobulin G (IgG) seroconversion by any standard serologic assay between acute and convalescent sera

OR

Detection of mumps immunoglobulin M (IgM) antibody in a person who is either epidemiologically linked to a laboratory-confirmed case or has recently travelled to an area of known mumps activity

OR

Clinical illness (see section 5.0) in a person who has been epidemiologically linked to a laboratory-confirmed case.

3.2 Probable case

Acute onset of unilateral or bilateral tender, self-limited swelling of the parotid or other salivary gland, lasting greater than two days, in the absence of appropriate laboratory tests (i.e. laboratory testing for mumps was not or could not be performed), without other apparent cause, and without an epidemiological link to a laboratory confirmed case.

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[*] Individuals with suspect mumps who have been immunized with a mumps-containing vaccine in the last 5-42 days require specimen collection for viral detection (e.g. nucleic acid amplification testing) and subsequent genotyping. If wild-type mumps virus is detected, the case would be classified as confirmed. Those with evidence of vaccine-derived mumps virus on genotyping should be classified as adverse events following immunization (AEFI).

4.0 Laboratory Evidence

4.1 Laboratory Confirmation

Any of the following are considered appropriate laboratory methods for meeting the confirmed case definition above:

- Positive mumps virus culture
- Positive Reverse Transcriptase-Polymerase Chain Reaction (RT-PCR) for mumps virus RNA
- Positive mumps IgM with clinical illness with an epidemiological link or recent travel to an area of known mumps activity
- Mumps IgG seroconversion between acute and convalescent sera

4.2 Approved/Validated Tests

- Standard culture for mumps virus
- RT-PCR for mumps virus RNA
- Commercial tests for anti-mumps IgM and IgG antibodies

Follow Public Health Ontario Laboratory guidance regarding appropriate specimens for each testing methodology.

4.3 Indications and Limitations

- IgM serology for mumps is most useful in cases of primary infection and may be of limited use in an individual who has a history of mumps vaccination.
- IgM serology has the potential for false-positive findings. In the absence of recent travel/exposure history, IgM results must be confirmed using other confirmatory methods as listed.
- A buccal swab, throat swab and urine are the recommended clinical samples for RT-PCR testing. In order to increase the overall sensitivity of testing, all three specimens should be submitted, as not all sites are positive at the same time.
- Further strain characterization is conducted for epidemiologic, public health and control purposes – this will be performed routinely on all PCR-positive specimens.
- The Canadian Public Health Laboratory Network has endorsed the addition of mumps RT-PCR testing as a standard approach for mumps virus RNA detection.

5.0 Clinical Evidence

Clinical illness is characterized by acute onset of unilateral or bilateral tender, self-limited swelling of the parotid or other salivary glands, lasting greater than two days, and without another apparent cause.

Infection with mumps virus may present as aseptic meningitis, encephalitis, hearing loss, orchitis, oophoritis, parotitis or other salivary gland swelling, mastitis or pancreatitis.

Up to one third of infections do not cause clinically noticeable parotid swelling and may primarily manifest with respiratory tract symptoms.

6.0 ICD-10 Code(s)

B26 Mumps

7.0 Comments

Optimal recovery of mumps virus or detection of mumps RNA is achieved if specimens are obtained within three to five days after symptom onset. Virus may still be detectable in buccal and throat swabs collected up to 9 days and urine up to 14 days after symptom onset. Submission of all three specimens will increase case detection, as not all sites are PCR-positive at the same time. PCR testing of cerebrospinal fluid (CSF) should be ordered if there is clinical suspicion of meningitis or encephalitis.

For serology, acute serum specimen IgM and IgG for mumps should be collected as soon as possible or within five days of symptom onset. If the initial IgM antibody is negative or indeterminate at onset of illness and mumps is considered likely, a convalescent serum specimen for mumps IgM and IgG should be repeated at least ten to 14 days after the initial (acute) sample.

Due to changes in the laboratory assays used for mumps serology, there is no longer a standardized definition of a ‘significant rise’ in IgG titre. This is a change from previous case definitions which included a significant rise in IgG titre (e.g. fourfold or greater) between acute and convalescent serum samples when tested in parallel using older assays.

8.0 Sources

Committee on Infectious Diseases, American Academy of Pediatrics. Section 3: Summaries of Infectious Diseases: Mumps. In: Kimberlin DW, Brady MT, Jackson MA, Long SS, editors. Red Book: 2018 Report of the Committee on Infectious Diseases. 31 ed. Itasca, IL: American Academy of Pediatrics; 2018.

Public Health Agency of Canada. Mumps. In: Case Definitions for Communicable Diseases under National Surveillance. Canada Communicable Disease Report. 2009;35S2.

Public Health Agency of Canada. Guidelines for the prevention and control of mumps outbreaks in Canada. Canada Communicable Disease Report. 2010;36S1.

9.0 Document History

Table 1: History of Revisions

Revision Date	Document Section	Description of Revisions
January 2014	General	New template. Section 9.0 Additional Resources and 10.0 Document History added.
January 2014	3.1 Confirmed Case	First sentence changed from "Laboratory confirmation of infection with clinically compatible signs and symptoms in the absence of recent immunization with mumps-containing vaccine" to "Laboratory confirmation of infection with clinically compatible signs and symptoms (**see Section 5.0**) in the absence of recent history of immunization with a mumps-containing vaccine **in the last seven to 42 days**". Second bullet point changed from "Detection of mumps virus ribonucleic acid (RNA) by a validated nucleic acid amplification test (NAT) from an appropriate clinical specimen (e.g., buccal swab and urine sample; buccal swab is preferred)" to "Detection of mumps virus ribonucleic acid (RNA) from an appropriate clinical specimen (refer to above)".

Revision Date	Document Section	Description of Revisions
January 2014	3.1 Confirmed Case	Third bullet point changed from "Demonstration of seroconversion or a significant (e.g., fourfold or greater) rise in mumps IgG antibody level between the acute and convalescent sera" to "Seroconversion or significant rise (e.g. fourfold or greater) in mumps IgG titre by any standard serologic assay between acute and convalescent sera". Fourth bullet point changed from "Positive serologic test for mumps Immunoglobulin M (IgM) antibody using a recommended assay in a person who is either epidemiologically linked to a laboratory- confirmed case or has recently travelled to an area of known mumps activity" to "Detection of mumps immunoglobulin M (IgM) antibody in a person who is either epidemiologically linked to a laboratory-confirmed case or has recently travelled to an area of known mumps activity"
January 2014	3.2 Probable Case	"Clinically compatible signs and symptoms in a person with recent travel to an area of known mumps activity" deleted.
January 2014	4.1 Laboratory Confirmation	Second bullet point ("Positive (NAT) for mumps virus") deleted and replaced with "Positive RT-PCR for mumps virus RNA". Third bullet point changed from "Positive for mumps IgM antibody (with an epidemiologic link)" to "Positive for mumps IgM with clinical illness with an epidemiological link or travel history". Fourth bullet point changed from "Seroconversion or a significant (i.e., fourfold or greater) rise in mumps Immunoglobulin G (IgG) titre" to "Seroconversion or significant rise (e.g. fourfold or greater) in mumps IgG titre between acute and convalescent sera."

Revision Date	Document Section	Description of Revisions
January 2014	4.2 Approved/ Validated Tests	"NAT for mumps virus RNA" deleted. "RT-PCR for mumps virus RNA" added. "Consult with Public Health Ontario Laboratories about appropriate specimens for each testing methodology" added.
January 2014	4.3 Indications and Limitations	The following two bullet points deleted: "Reverse Transcriptase-Polymerase Chain Reaction (RT-PCR) is the new gold- standard for mumps detection" and "A buccal swab is the preferred specimen". The second to fifth bullet points added.
January 2014	5.0 Clinical Evidence	Addition of second and third sentences.
January 2014	7.0 Comments	Entire section revised.
January 2014	8.0 Sources	Updated.
February 2019	General	Minor revisions were made to support the regulation change to Diseases of Public Health Significance, references were updated and Section 9.0 was deleted.
February 2019	3.0 Case Classification	Updates made to section.
February 2019	4.0 Laboratory Evidence	Updates made to section.


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