

Appendix A: Disease-Specific Chapters

Chapter: Mumps

Revised January 2014

Mumps

Communicable

Virulent

Health Protection and Promotion Act:

Ontario Regulation 558/91 – Specification of Communicable Diseases

Health Protection and Promotion Act:

Ontario Regulation 559/91 – Specification of Reportable Diseases

1.0 Aetiologic Agent

Mumps is caused by a RNA (ribonucleic) virus of the genus *Rubulavirus* in the *Paramyxoviridae* family.^{1,2}

2.0 Case Definition

2.1 Surveillance Case Definition

[See Appendix B.](#)

2.2 Outbreak Case Definition

Public health units should notify Public Health Ontario (PHO), as specified by the Ministry of Health and Long-Term Care (the Ministry), when a case is identified. If secondary transmission occurs, an outbreak case definition may be developed in consultation with PHO based on a review of the epidemiology of identified cases. The outbreak case definition may evolve over time to reflect the changing dynamics of the outbreak.

The outbreak case definition varies with the outbreak under investigation. Consideration should be given to the provincial surveillance case definition and the following criteria when establishing an outbreak case definition:

1. Clinical, laboratory and/or epidemiological criteria;
2. Time frame of occurrence;
3. Geographic location(s) or place(s) where cases live or became ill/exposed;
4. Special attributes of cases (e.g. age, underlying conditions); and,
5. Further strain typing as appropriate, which may be used to support linkage.

3.0 Identification

3.1 Clinical Presentation

Fever, swelling and tenderness of one or more salivary glands are characteristic of mumps.¹ Parotitis (inflammation of the parotid gland) will develop in about 40% of those infected, 25% of which is unilateral.³ In approximately 20% to 30% of mumps cases, infections are subclinical, but remain communicable.^{1,4} Nonspecific or primarily respiratory symptoms that occur in about 50% of those who acquire infection can add to the difficulty in diagnosing mumps.^{3,4} Orchitis (testicular inflammation) is a relatively common complication among

post-pubertal males (20-30%), whereas other complications are rare and include oophoritis (ovarian inflammation) and sensorineural hearing loss.^{1,3} In general, permanent sequelae are rare, although mumps infection in adults is more likely to be severe and result in complications.^{2,3}

Mumps was a major cause of viral meningitis prior to widespread use of mumps vaccine. Mumps infection during the first trimester of pregnancy may increase the rate of spontaneous abortion, but mumps infection during pregnancy has not been associated with congenital malformations.³

3.2 Diagnosis

[See Appendix B](#) for diagnostic criteria relevant to the Case Definitions.

For further information about human diagnostic testing, contact the Public Health Ontario Laboratories or refer to the Public Health Ontario Laboratory Services webpage: <http://www.publichealthontario.ca/en/ServicesAndTools/LaboratoryServices/Pages/default.aspx>

4.0 Epidemiology

4.1 Occurrence

Between 2007 and 2011, an average of 136 cases occurred per year in Ontario. The incidence of mumps in Ontario has increased significantly since 2007 with the increase mainly driven by outbreaks. Mumps cases in the susceptible cohort who were born between 1980 and 1992 accounted for 41% of mumps cases reported in 2011.

For more information on infectious diseases activity in Ontario, refer to the current versions of the Ontario Annual Infectious Diseases Epidemiology Reports and the Monthly Infectious Diseases Surveillance Report.^{5,6}

4.2 Reservoir

Humans.¹

4.3 Modes of Transmission

Transmission is generally by droplet spread during face-to-face contact and direct contact with saliva or respiratory droplets from the nose or throat of an infected person. Mumps is spread through coughing, sneezing, sharing drinks, kissing, or from contact with any surface that has been contaminated with droplets containing the mumps virus.^{3,4}

4.4 Incubation Period

The incubation period ranges from 12 and 25 days, commonly between 16 and 18 days.¹

4.5 Period of Communicability

Mumps can be communicable from seven days before and up to five days after the onset of parotitis.⁴ Recent evidence suggests that while mumps virus can be isolated from saliva and respiratory secretions for up to nine days after the onset of parotitis, there is a significant

reduction in viral secretion by five days after symptom onset, thereby reducing the risk of transmission.^{3,7}

4.6 Host Susceptibility and Resistance

After natural infection, immunity is generally lifelong.¹ Effectiveness of mumps vaccination after one dose is estimated to be between 62% and 91% and between 76% and 95% after two doses.³ There is also evidence to suggest waning immunity after both one and two doses of vaccine.³

In Ontario, susceptibility of young adults to mumps infection identified in the cohort born between approximately 1980 and 1992 can be attributed to the receipt of a single dose of mumps-containing vaccine, as well as the circulation of wild virus.⁸

5.0 Reporting Requirements

5.1 To local Board of Health

Individuals who have or may have mumps shall be reported to the Medical Officer of Health (MOH) by persons required to do so under the *Health Protection and Promotion Act*, R.S.O. 1990 (HPPA).⁹

Note: Laboratory confirmed cases are to be reported by phone to the local MOH as soon as identified.

5.2 To the Ministry of Health and Long-Term Care (the ministry) or Public Health Ontario (PHO), as specified by the ministry

Report only case classifications specified in the case definition.

Cases shall be reported using the integrated Public Health Information System (iPHIS), or any other method specified by the ministry, **within one business day of receipt of initial notification** as per iPHIS Bulletin #17: Timely Entry of Cases.¹⁰

The minimum data elements to be reported for each case are specified in the following:

- *Ontario Regulation 569* (Reports) under the HPPA;¹¹
- The iPHIS User Guide published by PHO; and
- Bulletins and directives issued by PHO.

6.0 Prevention and Control Measures

6.1 Personal Prevention Measures

Immunize as per the current *Publicly Funded Immunization Schedules for Ontario*.¹² According to the *Immunization of School Pupils Act*,¹³ all students without valid exemptions must have documented receipt of one dose of mumps-containing vaccine on or after the first birthday usually given as measles-mumps-rubella (MMR) or measles-mumps-rubella-varicella (MMRV) depending upon age. A two-dose mumps vaccine schedule is now recommended.

Six to 23 days after MMR immunization, approximately 5% of immunized children experience malaise and fever (with or without rash) lasting up to 3 days. Parotitis, rash, lymphadenopathy, and joint symptoms also occur occasionally after MMR immunization.³ Parotitis should be reported as an adverse event following immunization (AEFI) rather than a case of mumps if it meets the reporting criteria for parotitis specified in the AEFI disease-specific chapter in Appendix B (i.e., 5 to 30 days).

6.2 Infection Prevention and Control Strategies

For hospitalized cases, droplet precautions, in addition to routine practice, are recommended until five days after onset of symptoms.⁴

Refer to Public Health Ontario's website at www.publichealthontario.ca to search for the most up-to-date Provincial Infectious Diseases Advisory Committee (PIDAC) best practices on Infection Prevention and Control (IPAC). PIDAC best practice documents can be found at:

http://www.publichealthontario.ca/en/BrowseByTopic/InfectiousDiseases/PIDAC/Pages/PIDAC_Documents.aspx.

6.3 Management of Cases

All clinical cases should be managed as confirmed cases until laboratory evidence suggests otherwise.⁴ Cases should be advised to stay home from school or post-secondary educational institutions, child care facilities, workplaces, and other group settings for five days from symptom onset. Self-isolation will prevent exposure of susceptible individuals to the virus.⁴

Cases should be investigated to determine the source of infection, including inquiring about travel history or exposure to persons who have recently travelled and documenting location of travel. Refer to Section 5: Reporting Requirements above for relevant data to be collected during case investigation. The following disease specific information should also be obtained during case management:⁴

- Clinical: symptoms, date of symptom onset, hospitalization and complications;
- Laboratory: specimen type, specimen source, further strain characterization;
- Immunization status, specifically dates of vaccination with mumps-containing vaccines; and,
- Epidemiologic: exposure (i.e. contact history [see below], travel history including location and dates, attendance at daycare/school/educational institution, occupation).

A health care worker (HCW) who is a case should report to Occupational Health and/or Infection Control at the facility where they work.

Refer to the Guidelines for the Prevention and Control of Mumps Outbreaks in Canada from the Public Health Agency of Canada (available from <http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/10vol36/36s1/index-eng.php>) for additional guidance on case management.⁴

6.4 Management of Contacts

Contacts are defined by fulfillment of at least one of the following criteria during the infectious period (i.e., approximately seven days before to five days after symptom onset):⁴

- i. Household contacts of a case;
- ii. Persons who share sleeping arrangements with the case, including shared rooms (e.g., dormitories);
- iii. Direct contact with the oral/nasal secretions of a case (e.g., face-to-face contact, sharing cigarettes/drinking glasses/food/cosmetics like lip gloss, kissing on the mouth);
- iv. Children and staff in child care and school facilities (as deemed necessary by the epidemiology of the outbreak); or
- v. HCW with unprotected face-to-face interaction within 1 metre of an infectious mumps case (see below).

Susceptible contacts include:⁴

- Those born in Canada in 1970 or later who did not receive two doses of mumps-containing vaccine (at least 4 weeks apart) on or after their first birthday;
- Those without past history of laboratory confirmed mumps; and
- Those without documented immunity to mumps.

Susceptible HCW should follow the OHA/OMA protocol (see <http://www.oha.com/Services/HealthSafety/Documents/Mumps%20Revised%20Protocol%20-%20May2013.pdf>.)¹⁴

Post-exposure prophylaxis with mumps immune globulin (Ig) is ineffective.^{2,4} Contacts should be advised of signs and symptoms of mumps infection that can occur within 25 days of exposure, to seek medical attention upon symptom onset if required, and to inform the local public health unit.

Assessment of immunization status and immunization with a mumps-containing vaccine as appropriate for age and risk factors should be conducted for susceptible contacts.⁴ Although mumps immunization after exposure to mumps may not prevent the disease, should the exposure not result in infection, the vaccine will confer protection against future exposures.³

6.5 Management of Outbreaks

In response to an outbreak, the disease control principles are as outlined above for case and contact management, with expansion of contact surveillance and additional vaccination considerations.

Provide public health management of outbreaks or clusters in order to identify the source of illness and stop the outbreak. As per the *Infectious Diseases Protocol, 2008* (or as current), outbreak management shall comprise of, but not be limited to, the following general steps:

- Confirm diagnosis and verify the outbreak;
- Establish an outbreak team;
- Develop an outbreak case definition;
- Implement prevention and control measures;
- Implement and tailor communication and notification plans depending on the scope of the outbreak;
- Conduct epidemiological analysis on data collected;
- Conduct environmental inspections of implicated premise where applicable;
- Coordinate and collect appropriate clinical specimens where applicable;

- Prepare a written report; and
- Declare the outbreak over in collaboration with the outbreak team.

For an outbreak in a school, susceptible students can be excluded under Section 12 of the *Immunization of School Pupils Act*.¹³ For an outbreak in a daycare/child care centre, susceptible children can be excluded under Section 33 of the *Day Nurseries Act*.¹⁵

Please refer to the Guidelines for the Prevention and Control of Mumps Outbreaks in Canada from the Public Health Agency of Canada (available from <http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/10vol36/36s1/index-eng.php>) for additional guidance on outbreak management.⁴

7.0 References

- 1 Heymann D, editor. Control of communicable diseases manual. 19th ed. Washington, DC: American Public Health Association; 2008.
- 2 American Academy of Pediatrics. Mumps. In: Pickering LK, Baker CJ, Kimberlin DW, Long SS, editors. Red book: 2006 report of the Committee on Infectious Diseases. 27th ed. Elk Grove Village, IL: American Academy of Pediatrics; 2006:468-72.
- 3 National Advisory Committee on Immunization; Public Health Agency of Canada. Canadian immunization guide. Evergreen ed. Part 4 active vaccines: mumps vaccine. Ottawa, ON: Her Majesty the Queen in Right of Canada; 2012 [cited 2013 Aug 27]. Available from: <http://www.phac-aspc.gc.ca/publicat/cig-gci/p04-mump-orei-eng.php>.
- 4 Public Health Agency of Canada (PHAC). Supplement: guidelines for the prevention and control of mumps outbreaks in Canada. Can Commun Dis Rep. 2010 [cited 2013 Aug 27];36S1. Available from: <http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/10vol36/36s1/index-eng.php>.
- 5 Ontario. Ministry of Health and Long-Term Care. Ontario annual infectious diseases epidemiology report, 2009. Toronto, ON: Queen's Printer for Ontario; 2009 (or as current) [cited 2013 Aug 27]. Available from: http://www.health.gov.on.ca/en/common/ministry/publications/reports/epi_reports/epi_report_2009.aspx.
- 6 Ontario Agency for Health Protection and Promotion (Public Health Ontario). Monthly infectious diseases surveillance report. 1(2). Toronto, ON: Queen's Printer for Ontario; 2012 [cited 2013 Aug 27]. Available from: http://www.publichealthontario.ca/en/DataAndAnalytics/Documents/2012_January_PHO_Monthly_Report.pdf
- 7 Centers for Disease Control and Prevention. Summary of notifiable diseases – United States, 2008. MMWR Morb Mortal Wkly Rep. 2008 [cited 2013 Aug 27];57(54):13. Available from: http://www.cdc.gov/mmwr/mmwr_nd/index.html.
- 8 Deeks SL, Lim GH, Simpson MA, Gagne L, Gubbay J, Kristjanson E, et al. An assessment of mumps vaccine effectiveness by dose during an outbreak in Canada. CMAJ. 2011 [cited 2013 Aug 27];183(9):1014-20. Available from: <http://www.cmaj.ca/content/183/9/1014.full>.
- 9 *Health Protection and Promotion Act*, R.S.O. 1990, c. H.7. Available from: http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_90h07_e.htm
- 10 Ontario. Ministry of Health and Long-Term Care. Timely entry of cases and outbreaks. iPHIS bulletin. Toronto, ON: Queen's Printer for Ontario; 2012 :17 (or as current).

- 11 *Reports*, R.R.O. 1990, Reg. 569. Available from:
http://www.elaws.gov.on.ca/html/regs/english/elaws_regs_900569_e.htm
- 12 Ontario. Ministry of Health and Long-Term Care. *Publicly funded immunization schedules for Ontario*: August 2011. Toronto, ON: Queen’s Printer for Ontario; 2011 [cited 2013 Aug 27]. Available from:
<http://www.health.gov.on.ca/en/public/programs/immunization/docs/schedule.pdf>
- 13 *Immunization of School Pupils Act*, R.S.O. 1990, c. I.1. Available from:
http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_90i01_e.htm.
- 14 Joint Communicable Diseases Surveillance Protocols Committee, Ontario Hospital Association; Ontario Medical Association. Mumps surveillance protocol for Ontario hospitals. Revised May 2013. Toronto, ON: Ontario Hospital Association; 2013 [cited 2013 Dec 27]. Available from:
<http://www.oha.com/Services/HealthSafety/Documents/Mumps%20Revised%20Protocol%20-%20May2013.pdf>
- 15 *Day Nurseries Act*, R.R.O. 1990, Reg. 262. Available from:
http://www.e-laws.gov.on.ca/html/regs/english/elaws_regs_900262_e.htm

8.0 Additional Resources

Ontario Agency for Health Protection and Promotion (Public Health Ontario), Provincial Infectious Diseases Advisory Committee. Routine practices and additional precautions in all health care settings. 3rd ed. Toronto, ON: Queen’s Printer for Ontario; 2012. Available from: http://www.publichealthontario.ca/en/eRepository/RPAP_All_HealthCare_Settings_Eng2012.pdf

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http://publications.gc.ca/collections/collection_2012/aspc-phac/HP40-75-2012-eng.pdf

9.0 Document History

Table 1: History of Revisions

Revision Date	Document Section	Description of Revisions
January 2014	General	New template. Title of Section 4.6 changed from “Susceptibility and Resistance” to “Host Susceptibility and Resistance” Title of Section 5.2 changed from “To Public

Revision Date	Document Section	Description of Revisions
		Health Division (PHD)” to “To the Ministry of Health and Long-Term Care (the ministry) or Public Health Ontario (PHO), as specified by the ministry” Section 9.0 Document History added.
	2.2 Outbreak Case Definition	Addition of the first paragraph. Addition of the fifth bullet point under the second paragraph. Deletion of the following sentence: “Cases should also be classified by levels of probability (i.e. confirmed, probable or suspect).”
	3.1 Clinical Presentation	Entire section revised.
	3.2 Diagnosis	Addition of direction to contact Public Health Ontario Laboratories or PHO website for additional information on human diagnostic testing.
	4.1 Occurrence	Entire section revised.
	4.3 Modes of Transmission	Entire section revised.
	4.4 Incubation Period	Changed from “The average length of the incubation period is 16-18 days, however it can range from 14-25 days” to “The incubation period ranges from 12 and 25 days, commonly between 16 and 18 days”.
	4.5 Period of Communicability	Entire section revised.
	4.6 Host Susceptibility and Resistance	Entire section revised.
	5.1 To Local Board of Health	“Note: Laboratory confirmed cases are to be reported by phone to the local MOH as soon as identified” added.
	6.1 Personal Prevention Measures	Entire section revised.
	6.2 Infection Prevention and Control Strategies	Addition of reference to PIDAC IPAC best practices documents.
	6.3 Management of	Entire section revised.

Revision Date	Document Section	Description of Revisions
	Cases	
	6.4 Management of Contacts	Entire section revised.
	6.5 Management of Outbreaks	<p>The following was deleted:</p> <p>“An outbreak is defined by the usual epidemiological principles of a greater than expected number of cases that are spatially and temporally linked”.</p> <p>“PHD provides support in the management of an outbreak only if the Health Unit requires additional MMR vaccine, requests assistance of the PHD or if the outbreak spans more than one Health Unit”.</p> <p>“For more detailed information on outbreak management see the Interim Ontario Guidelines for Public Health Management of Mumps, May 25, 2007”.</p> <p>The following was added:</p> <p>“In response to an outbreak, the disease control principles are as outlined above for case and contact management, with expansion of contact surveillance and additional vaccination considerations”.</p> <p>“For an outbreak in a daycare/child care centre, susceptible children can be excluded under Section 33 of the Day Nurseries Act”.</p> <p>“Please refer to the Guidelines for the Prevention and Control of Mumps Outbreaks in Canada from the Public Health Agency of Canada (available from http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/10vol36/36s1/index-eng.php) for additional guidance on outbreak management”</p>
	7.0 References	Updated.
	8.0 Additional Resources	Updated.

