

# **MUMPS SURVEILLANCE PROTOCOL FOR ONTARIO HOSPITALS**

Developed by the Ontario Hospital Association and the  
Ontario Medical Association  
Joint Communicable Diseases Surveillance Protocols Committee

Approved by:  
The OHA and The OMA Board of Directors  
The Ministry of Health and Long-Term Care –  
The Minister of Health and Long-Term Care

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This protocol was developed jointly by the Ontario Hospital Association and the Ontario Medical Association to meet the requirements of the *Public Hospitals Act 1990*, Revised Statutes of Ontario, Regulation 965. This regulation requires each hospital to have by-laws that establish and provide for the operation of a health surveillance program including a communicable disease surveillance program in respect of all persons carrying on activities in the hospital. The communicable disease program is to include the tests and examinations set out in any applicable communicable disease surveillance protocol. The regulation states that the communicable disease surveillance protocols that hospitals must adopt are those "published jointly by the Ontario Hospital Association (OHA) and the Ontario Medical Association (OMA) and approved by the Minister (of Health and Long-Term Care)."

This Protocol has been reviewed since the previous version; changes have been highlighted in yellow for easy identification. Protocols are reviewed on a regular basis, every two years or as required.

The protocol reflects clinical knowledge, current data and experience, and a desire to ensure maximum cost effectiveness of programs, while protecting health care workers and patients. It is intended as a minimum standard that is practical to apply in most Ontario hospital settings. It does not preclude hospitals from adopting additional strategies that may be indicated by local conditions.

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# Rationale for Mumps Surveillance Protocol

Mumps is an acute viral illness, caused by mumps virus, characterized by fever and swelling of one or more salivary glands, usually the parotid gland. About one-third of infections are subclinical.<sup>1</sup> Non-specific or primarily respiratory symptoms occur in about one-half of those infected.<sup>2</sup> Orchitis occurs in 20-30% of post-pubertal males, with testicular atrophy in about one-third of these cases and rarely sterility;<sup>3</sup> oophoritis occurs in 5% of post-pubertal females.<sup>2</sup> Pancreatitis, usually mild, occurs in 4% of cases.<sup>3</sup> Aseptic meningitis occurs in 10% of cases.<sup>1</sup> Mumps infection in the first trimester of pregnancy is associated with spontaneous abortion (25%); there is no evidence that mumps causes congenital malformation.<sup>4</sup> Mumps occurs worldwide and humans are the only host. In countries with high vaccination coverage such as Canada, sporadic cases of mumps occur throughout the year with peaks in incidence attributed to outbreaks.

Mumps is spread by large respiratory droplet and direct contact with saliva of an infected person. Virus is also excreted in the urine. The incubation period is usually about 16–18 days (range 12–25 days).<sup>3</sup> Virus has been isolated in saliva from 7 days before the onset of parotitis to 9 days after, with maximum infectiousness between 2 days before to 5 days after onset.<sup>3</sup>

Mumps vaccine was licensed for use in Canada in 1969 and trivalent measles-mumps-rubella vaccine (MMR) in 1972. In clinical trials, a single dose of mumps vaccine induced antibody in 95% of susceptible people.<sup>2</sup> Mumps vaccine effectiveness has been estimated at 62% to 91% for one dose and 76% to 95% for two doses.<sup>2</sup> The “cold chain” (maintenance of the vaccine within the temperature range specified by the manufacturer) is essential for viability of live virus vaccines and their ability to confer immunity.<sup>5</sup> In Canada, there has been a substantial reduction in cases since the introduction of vaccine in the 1970s, and large outbreaks of mumps have been uncommon in recent years.<sup>2</sup>

Over the past decade, the annual mumps incidence in Ontario has ranged between 0.1 and 2.60 cases per 100,000 population.<sup>6</sup> Ontario has experienced several outbreaks in the past decade that have led to an increase in cases.

Public Health Ontario's Infectious Disease Monthly Surveillance Report of Diseases of Public Health Significance for 2018 reported 93 cases of mumps with case rates of 6.4 per 1,000,000 population. The five year average number of cases in Ontario between 2013 and 2017 was 73.2, and the five year case rate average was 5.3.<sup>7</sup>

In 2017, 259 cases of mumps were reported in Ontario, which was the second highest incidence of mumps since 2008, when a large outbreak occurred in an unimmunized community in southwestern Ontario. Cases were reported from 22 public health units with the largest proportion occurring in Toronto (53%). Approximately 88% of the cases

occurred in adults 18 years of age or older, with 68% (n=156) of those born between 1970 and 1992. Almost half (47%) had unknown immunization status. Among the remaining 83 cases, 51% received one dose of MMR and 27% were unimmunized. Among cases of all ages who received two or more doses of MMR (n=67), the median interval between the last MMR dose and disease onset was 14 years. This likely suggests a role of waning vaccine-induced immunity to mumps in this population that together with the under-immunization of adults (either no doses or one dose of MMR), contributed to the increased mumps activity in 2017.<sup>6</sup>

Between January 2017 and February 2018 there was a large outbreak of mumps in the Greater Toronto area with 173 cases reported, age ranging between 18 and 34 years. The majority of cases (84%) were community acquired. Five cases (3%) were born before 1970, a date when acquired natural immunity has generally been presumed. Exposures in schools and post-secondary education accounted for 16% (n=23) of cases. Vaccination history was unknown in 39% (n=56) of cases; 34% (n=49) were either partially vaccinated with a single dose of MMR or not vaccinated; 27% (n=38) had received the recommended two doses of mumps vaccine.<sup>8</sup>

Since March 2018, in Ontario, The Ministry of Health and Long-Term Care has updated mumps vaccination recommendations during outbreaks. Based on local assessment and in consultation with the local Medical Officer of Health, an outbreak dose (third dose) of mumps-containing vaccine in an outbreak setting may be recommended to individuals previously vaccinated with two doses of mumps-containing vaccine who are part of a group or population who are at increased risk of acquiring mumps.<sup>9</sup>

In the United States, in response to the increasing number of mumps outbreaks occurring in populations who have been fully vaccinated, the Advisory Committee on Immunization Practices (ACIP) now recommends that during an outbreak, those previously vaccinated with two doses of a mumps virus-containing vaccine who are identified by public health authorities as part of a population or group at increased risk for acquiring mumps, should receive a third dose of a mumps virus-containing vaccine.<sup>10</sup>

The National Advisory Committee on Immunization (NACI) recommends two doses of mumps virus-containing vaccine, including HCWs, as they are more likely to encounter cases of mumps than the general population when those cases seek health care.<sup>2</sup> In Ontario, a second dose of MMR vaccine was implemented in 1996 resulting in a two-dose schedule for mumps for children born in or after 1992. Recommendation for an additional dose of mumps-containing vaccine as part of outbreak management is under consideration by NACI.

Most cases of mumps in health care workers (HCWs) are community acquired.<sup>11,12</sup> Mumps transmission in health care facilities has also been documented including transmission to HCWs, and mumps poses a small but real risk to both patients and staff particularly when there are community outbreaks of mumps with introduction of mumps into the facility.<sup>13,14</sup> The HCWs at highest risk are those most likely to come in contact with mumps patients. Further, transmission from HCWs to patients has been reported.<sup>13</sup> Identification and isolation of patients with mumps is only partially effective in preventing transmission because mumps virus can be isolated from saliva prior to onset of symptoms, and an estimated 30% of cases are asymptomatic but still capable of transmission.<sup>13</sup> Identification of susceptible HCWs and immunization with mumps vaccine will help protect both HCWs and patients.<sup>14</sup>

HCWs should consider the diagnosis of mumps in patients presenting with fever and parotitis, even in immunized individuals, and promptly institute droplet precautions.

**This protocol is only one component of an infection prevention and control program; HCWs must consistently adhere to Routine Practices.**

# Mumps Surveillance Protocol for Ontario Hospitals

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## I. Purpose

The purpose of this protocol is to provide direction to hospitals to prevent the transmission of mumps virus among health care workers (HCWs) and patients. This protocol provides the minimum standards required under the Ontario Public Hospitals Act, Regulation 965.

## II. Applicability

This protocol applies to **all persons carrying on activities in the hospital**, including but not limited to employees, physicians, nurses, contract workers, students, post-graduate medical trainees, researchers and volunteers. The term health care worker (HCW) is used in this protocol to describe these individuals. This protocol does not apply to patients or residents of the facility or to visitors.

When training students or hiring contract workers, the hospital must inform the school/supplying agency that the school/agency is responsible for ensuring that their students/contractors are managed according to this protocol.

**This protocol is for the use of the Occupational Health Service (OHS) in hospitals. It is expected that OHS collaborate with Infection Prevention and Control (IPAC) and other departments, as appropriate.**

## III. Pre-placement

At the time of hiring, OHS must ask all HCWs for evidence of immunity. Only the following should be accepted as proof of mumps immunity:

- documentation of receipt of two doses of mumps-containing vaccine given at least four weeks apart on or after the first birthday, **OR**
- laboratory evidence of immunity.

The OHS should make all reasonable efforts, together with the new hire/placement, to obtain previous immunization records. If this documentation is not available, the OHS must ensure that the HCW has received two doses of mumps containing vaccine (available as trivalent measles-mumps-rubella [MMR] vaccine). Documentation of each HCW's status must be kept up to date with

current requirements and available in the occupational health record. If a HCW is already immune to any of the vaccine components, there is no increased risk of adverse reaction from vaccination.<sup>2</sup> While there is no known fetal risk to giving mumps vaccine during pregnancy, because MMR vaccine is a live vaccine, it should not be given to pregnant women.<sup>2</sup> Females of child-bearing age must first assure the OHS that they are not pregnant, and will not become pregnant for one month after receiving this vaccine.

Serologic testing is not routinely recommended either before or after receiving mumps containing (MMR) vaccine.<sup>2</sup> If an HCW is already immune, there is no increased risk of adverse reaction from vaccination.

In the event that an HCW who has had two documented doses of appropriately administered (as defined in II) MMR or mumps containing vaccine is tested serologically, and is negative, an additional dose is not recommended; the HCW should be considered immune.<sup>1</sup>

Only HCWs known to be immune to mumps should be assigned to care for patients with suspected or confirmed mumps; susceptible HCWs should be excluded.<sup>11,15</sup>

#### **IV. Continuing Surveillance**

No routine continuing surveillance of any HCWs carrying on activities in the hospital is required. Follow-up is required for susceptible female HCWs unable to be vaccinated due to pregnancy. These HCWs have a responsibility to report to the OHS when they are no longer pregnant. The OHS must ensure that these women are offered mumps containing vaccine (i.e. MMR) when they are no longer pregnant.

Catch-up immunization of existing HCWs should be considered, particularly for groups of HCWs at higher likelihood of seeing mumps cases, e.g. Family Practice and Emergency Department staff and those who routinely provide care in those areas. Hospitals should consider giving a second dose of mumps containing vaccine (i.e. MMR) to HCWs who have previously only received one dose of mumps containing vaccine and do not have documented laboratory evidence of immunity, as HCWs may be exposed to mumps when patients with mumps seek care. HCWs who received a second dose of MMR for measles or rubella immunization are considered immune to mumps. Further, for those born before 1970 who do not have documented laboratory evidence of immunity and have never received mumps containing vaccine, two doses of MMR **are recommended.**

## V. Exposure

Only immune HCWs should be assigned to care for patients with suspected or confirmed mumps; susceptible HCWs should be excluded.<sup>11,15</sup> If the presence of a susceptible HCW within 1 metre of a patient with suspected or confirmed mumps is essential for patient care, personal protective equipment to prevent droplet transmission (i.e. surgical mask and eye protection) must be worn.<sup>7</sup>

Exposure is defined as contact of the oral or nasal mucous membranes of a susceptible HCW with infectious saliva from 7 days before up to 5 days after the onset of parotid swelling in the source patient.<sup>1,17</sup> Consider a susceptible HCW who provided care within 1 metre of a case of mumps without personal protective equipment to be potentially exposed.\*

When determining whether a HCW had an exposure to mumps, consider the following:

- immune status of the exposed person
- frequency of contact with the infected person
- proximity to the infected person (i.e. < 1 metre\*)
- duration of face-to-face contact with the infected person, and
- whether appropriate personal protective equipment was worn.

Any HCW who has an exposure to a person who has mumps, either in the health care setting or in the community, must report to OHS (See Appendix) for assessment and follow up.<sup>1</sup>

- Immune HCWs (as defined in III above) may continue to work. However, since mumps has occurred in previously vaccinated persons, immune, exposed HCWs should be advised of the symptoms of mumps and to report to OHS immediately if symptoms develop.
- HCWs who have received one dose of mumps-containing vaccine should be given a second dose (i.e. MMR), then they may return to work immediately.
- Susceptible exposed HCWs, i.e. those who have negative serology for mumps antibodies and who have never received mumps containing vaccine, should receive mumps containing vaccine (i.e. MMR) as soon as possible after the exposure if no contraindication exists, and should be excluded from work (see below). Although mumps immunization after exposure does not prevent disease, should the exposure not result in an

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\* The recommended distance for droplet precautions in patients who have acute respiratory infections that cause coughing and sneezing is 2 metres because coughing and sneezing results in forceful projection of potentially infectious respiratory droplets. For mumps, 1 metre is adequate for interruption of transmission to HCWs and patients.

infection, the vaccine should provide protection against future exposures. If clinical mumps does not develop after exposure, a second dose of mumps-containing vaccine (i.e. MMR) should be given four weeks after the first.

- Susceptible exposed HCWs for whom vaccine is contraindicated for medical reasons (e.g. immunocompromised, pregnant) should be excluded from work (see below). For HCWs who can later receive MMR vaccine (e.g. pregnant HCWs) in whom clinical mumps does not develop after exposure, two doses of MMR vaccine should be given four weeks apart.
- HCWs who have no documentation of immunity (as defined in III above) should receive one dose of mumps containing vaccine (i.e. MMR) if no contraindications exist. They are considered susceptible and should be excluded from work (see below). Serology should be performed; if mumps IgG positive, they may return to work. If IgG negative, work restrictions apply (see below).

## **Work Restrictions**

Susceptible exposed HCWs must be excluded from any work in the hospital from the 10th day after the first exposure through the 26<sup>th</sup> day after the last exposure, regardless of whether they received vaccine after the exposure.<sup>4,11</sup>

**HCWs must be excluded from work while waiting for serology results if they are still within the period of work exclusion defined above.**

**HCWs who are excluded from work should not work in any other health care setting. The HCWs should be counselled to disclose their work restrictions to other health care employer(s).**

## **VI. Acute Disease**

If clinical mumps develops, the HCW must remain off work until 5 days after the onset of parotid swelling.<sup>1,17</sup> Infected HCWs and their personal physicians are responsible for follow-up care and treatment.

OHS should inform IPAC of HCWs with suspected or confirmed mumps when exposure of patients or other HCWs may have occurred.

## VII. Reporting

Suspect or confirmed reportable diseases (as per the Ontario Regulation 135/18 and amendments under the Health Protection and Promotion Act), such as mumps, must be reported to the local Medical Officer of Health.

In accordance with the Occupational Health and Safety Act and its regulations, an employer must provide written notice within 4 days of being advised that a worker has an occupational illness, including an occupationally-acquired infection, and/or a Workplace Safety and Insurance Board (WSIB) claim has been filed by or on behalf of the worker with respect to an occupational illness, including an occupational infection, to the:

- Ministry of Labour,
- Joint Health and Safety Committee (or health and safety representative),  
and
- trade union, if any.

Occupationally-acquired infections and illnesses are reportable to the WSIB.

## VIII. Glossary

### Ontario MOHLTC Surveillance Case Definition for Mumps<sup>17</sup>

#### Confirmed Case:

Laboratory confirmation of infection with clinically compatible signs and symptoms in the absence of recent history of immunization with a mumps-containing vaccine in the last 7 to 42 days:

- Isolation of mumps virus from an appropriate clinical specimen (e.g., buccal swab, throat swab and urine culture); **OR**
- Detection of mumps virus ribonucleic acid (RNA) from an appropriate clinical specimen (refer to above); **OR**
- Seroconversion or significant rise (e.g., fourfold or greater) in mumps IgG 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**
- Clinically compatible signs and symptoms in a person who has been epidemiologically linked to a laboratory-confirmed case.

#### Probable Case

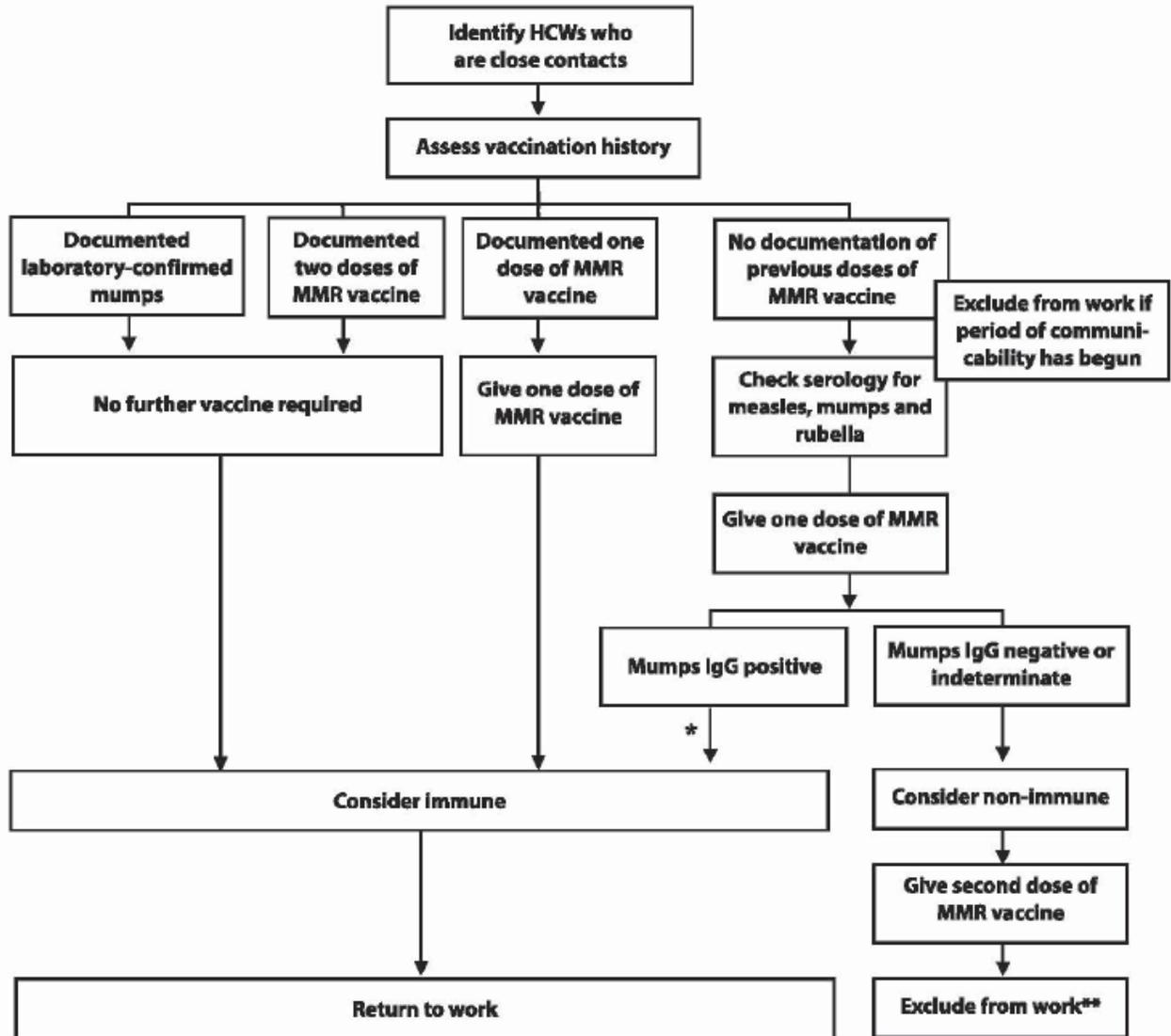
- Clinically compatible signs and symptoms in the absence of appropriate laboratory tests and without an epidemiologic link to a laboratory-confirmed case.

### Symptoms of Mumps<sup>17</sup>

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

## Appendix: Management of HCWs who are close contacts of a case of mumps<sup>1</sup>



\* May need a second dose of MMR vaccine for measles protection.

\*\* Contacts should be excluded from day 10 after the first contact of a case to day 26 after the last contact with a case (where day of exposure is day 1). The HCW may have returned to work prior to receiving the second dose of MMR.

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