

MEASLES 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
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This protocol was developed jointly by the Ontario Hospital Association and the Ontario Medical Association, in collaboration with the Ministry of Health and Long-Term Care, to meet the requirements of the *Public Hospitals Act 1990*, Revised Statutes of Ontario, Regulation 965.

The protocol is based on current scientific and medical knowledge and a desire to ensure maximum cost effectiveness of programs while protecting health care workers. It is intended as a minimum practical standard for Ontario hospitals. However, hospitals may adopt additional strategies when indicated by local conditions.

Members of the Joint OHA/OMA Communicable Disease Surveillance Protocols Committee

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Rationale for Measles Surveillance Protocol

Health care workers (HCWs) are at risk for occupationally acquired measles infection. Although cases are infrequent, they will seek healthcare, therefore HCWs are at higher risk than the general population of exposure to measles infection. HCWs should be immune to prevent acquisition and transmission of measles to others.

Measles is a highly contagious viral infection that can lead to serious consequences including encephalitis, otitis media, severe diarrhea, pneumonia and death. Encephalitis is estimated to occur in 1/1000 cases, while otitis media (middle ear infection) is reported in 5-15% of cases and pneumonia in 5-10% of cases.^{1,2} The disease is more severe in infants and adults over 20 years of age. Before measles vaccine became available in Canada, virtually all children contracted measles. People who recover from measles have life-long immunity.

The measles virus is spread by airborne droplet nuclei, close personal contact, or direct contact with the nasal or throat secretions of infected persons, and can remain active and contagious in the air, depending on the number of air changes, for up to two hours.^{1,2,3,4,5} Since the virus is airborne, close or direct contact is not required for transmission.

In Ontario, a live measles virus vaccine became available in 1963. After introduction of a live further attenuated measles virus vaccine in 1970 measles cases decreased by 95%. However, outbreaks continued to occur until a two-dose measles vaccine schedule was implemented in 1996.⁶ Endemic transmission of measles in Canada has been mostly interrupted since 1998.⁷

Nevertheless, measles remains a common illness in developing countries affecting more than 30 million people annually.¹ In Canada, where measles has been largely eliminated, cases imported from other countries remain an important source of infection, especially for children under one year of age. Between 2000 and 2009, only 108 confirmed cases of measles were reported in Ontario, the majority due to importation of the disease or imported cases spreading virus to susceptible persons, usually unimmunized children under one year of age or susceptible adults. However, in 2008, an outbreak of measles occurred in Ontario with 54 confirmed cases; 50% of cases were unimmunized, 20% reported 1 dose of vaccine and 7.5% reported 2 doses of vaccine. The majority of cases were school-aged children and adults.

On average, 14 days after exposure to an infected person a maculopapular rash appears first on the face and behind the ears, and then spreads downwards to the trunk and extremities.^{1,2,4} Symptoms of cough, fever, coryza, malaise and conjunctivitis occur 3 to 7 days prior to the appearance of the rash. Koplik spots on the buccal mucosa emerge shortly before the rash. The infectious period is from one day before the beginning of the prodromal period to four days after the onset of the rash.

Vaccination provides the best protection against measles infection. Maintaining high coverage rates for the measles vaccine will prevent future outbreaks.

The only effective control of transmission of measles in hospital settings is immunization. Susceptible health care workers are at risk of acquiring measles as well as transmitting measles to others. Therefore all HCWs, as a condition of employment, should provide evidence of immunity as per this protocol.

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I. Purpose

The purposes of this protocol are:

- i. To provide direction to hospitals for the management of measles infections among health care workers (HCWs), and
- ii. To establish a system for preventing transmission of measles among HCWs and patients.

II. Applicability

This protocol applies to all persons carrying on activities in the hospital, including employees, students, volunteers, undergraduate and postgraduate medical trainees, physicians and contract workers. The term HCW is used in this protocol to describe these individuals. This protocol does not apply to patients of the facility, or to visitors.

When hiring contract workers or training students, the hospital must inform the supplying agency/school that the agency/school is responsible for appropriate education, immunization and follow-up of their personnel, and maintenance of immunization records.

This protocol is for use by the Occupational Health Service (OHS) in hospitals.

III. Pre-placement

At the time of hiring, occupational health must ask all HCWs for evidence of immunity. Only the following should be accepted as proof of measles immunity.^{1,2}

- documentation of receipt of 2 doses of live measles virus vaccine on or

¹ Advisory Committee on Epidemiology. *Guidelines for Control of Measles Outbreaks in Canada*. **Canada Diseases Weekly Report 21 (21)**, 1995

² National Advisory Committee on Immunization (NACI) **Canadian Immunization Guide 7th edition, 2006**, Public Health Agency of Canada.

- after the first birthday, or
- laboratory evidence of immunity.

If this documentation is not available, the OHS must offer 2 doses of measles containing vaccine to the HCW (available as trivalent measles mumps rubella [MMR] vaccine). Documentation of each HCW's status must be kept current and available in the occupational health record. While there is no known fetal risk to giving measles vaccine during pregnancy, because MMR vaccine is a live vaccine, it should not be given to pregnant women.² 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.

Note: The previously accepted pre-placement assumption of immunity if the HCW was born before 1970 has been removed. There have been recent cases of measles in Ontario in persons born before 1970. Although this is an acceptable assumption for the general public, it is not sufficient for HCWs.

For reasons of patient safety, hospitals should make documented proof of immunity to measles a condition of employment. The OHS must counsel susceptible HCWs of the infection risks related to their activities in the hospital.

Measles **revaccination** should be offered to all HCWs who were previously given:

- live measles vaccine before 12 months of age; or
- killed measles vaccine at any age, whether given alone or followed by live measles vaccine within 2 years; or
- immune globulin, blood or blood products containing immune globulin within 5 months of receiving live measles vaccine.

Although serologic screening is not necessary before vaccination, screening may be done if the potential vaccinee requests it. If a HCW is already immune, there is no increased risk of adverse reaction from vaccination.

Only immune health care workers should be assigned to care for patients with known/suspected measles. If no immune staff are available and patient safety would be compromised by not allowing the susceptible HCW to attend the patient, the susceptible HCW must wear a fit-tested, seal-checked N95 respirator. There is no efficacy data for N95 respirators for this application.

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 personnel unable to be vaccinated pre-placement due to pregnancy. These HCWs have a responsibility to report to the OHS when they are no longer pregnant. The

occupational health service must ensure that these women are offered measles immunization when they are no longer pregnant.

Hospitals should consider giving a second dose of measles vaccine to HCWs, born after 1969, who have previously only received one dose of measles containing vaccine and do not have documented laboratory evidence of immunity, as HCWs are at greater risk than the general population of exposure to measles.² Further, for those HCWs born before 1970 who do not have documented laboratory evidence of immunity, immunization with MMR **should** be considered, particularly if they work in areas at increased risk of measles exposure, e.g. Emergency Departments, Urgent Care Centres, Family Practice clinics.

V. Exposure

Measles is a **highly** contagious disease spread by the airborne route, i.e., the virus is aerosolized by the patient and can be inhaled and produce disease in susceptible persons. Masks/respirators may not provide complete protection for a susceptible person. Therefore, a susceptible health care worker could still have a significant exposure to an infectious patient even if a mask/respirator is worn. Exposure to measles is considered significant if it involves sharing the same air space, either simultaneously or afterwards, as a clinical case of measles.

Any HCW who has a significant exposure to a person who has measles must report this exposure to the OHS.

- Immune HCWs (with evidence of immunity as defined in III above) may continue to work without disruption of their work pattern.
- Susceptible exposed HCWs should receive measles vaccine within 72 hours of the exposure. Post-exposure vaccine will usually provide protection, and, even beyond 72 hours, will provide protection for subsequent exposures.
- Susceptible exposed HCWs for whom vaccine is contraindicated for medical reasons, e.g. immunocompromised, must be offered immune globulin² within 6 days of exposure to prevent or modify measles.
- Susceptible exposed HCWs must be excluded from any work in the hospital from 5 days after the first exposure until 21 days after the last exposure³, regardless of whether they received vaccine or immune globulin after the exposure.

³ 2009 Red Book Report of the Committee on Infectious Diseases, **American Academy of Paediatrics**

VI. Acute Disease

If clinical measles develops, the HCW must remain off work until 4 complete days have passed after the onset of the rash.⁴

Infected HCWs and their personal physicians are responsible for follow-up care if disease occurs.

Measles is reportable to the local Medical Officer of Health. Occupationally acquired measles is reportable to the Ministry of Labour and WSIB.

⁴ Heymann D.L., **Control of Communicable Diseases Manual, 19th edition, 2008**, page 404.

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