



Guidance: Infection Prevention and Control Measures for Prehospital Care

July 28 2009

Pandemic (H1N1) 2009 Flu Virus

Appendix A : Point of Care Risk Assessment Tool for Pandemic (H1N1) 2009 Flu Virus

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Pandemic (H1N1) 2009 Flu Virus

This fact sheet has been developed to provide interim guidance for **prehospital care providers** in the infection prevention and control management of suspected or confirmed cases with Pandemic H1N1 2009 Flu Virus (H1N1 2009). Prehospital services should seek assistance from local infection prevention and control networks and/or consultants as needed to operationalize these recommendations, particularly if they do not have infection prevention and control expertise internally.

Prehospital care involves acute emergency patient assessment and care delivered in a variety of settings. Prehospital care providers may include paramedics, fire fighters, police and other emergency first responders. This interim guidance is designed to help slow (mitigate) the transmission of this virus; **it is expected that the infection prevention and control recommendations (particularly recommendations related to respiratory protection) may change as further information about the epidemiology (e.g., mode of transmission) and clinical course (e.g., mild or severe disease) of this virus is available as the outbreak evolves.** In this document a point of care risk assessment approach is used to guide decisions regarding the type of droplet precautions/respiratory protection to apply ([Appendix A](#)). However, prehospital care is delivered in a variety of locations and under a variety of situations (e.g., in the street, in the home, in the ambulance, etc.). Some locations may be unsanitary, uncontrolled and/or within cramped environments and not amenable to risk assessment (to identify the type of personal protective equipment (PPE) required) and/or application of barriers (e.g. 2 metre distance) other than PPE. As a result, prehospital care providers utilize personal protective equipment (PPE) differently than health care workers in the acute care setting. In some jurisdictions paramedics carry only N95 respirators and not surgical masks for their PPE.

This guidance document is being provided by the Public Health Agency of Canada in response to the Pandemic (H1N1) 2009 outbreak. This guidance is based on current, available scientific evidence about this emerging disease, and is subject to review and change as new information becomes available. The following guidance should be read in conjunction with relevant provincial and territorial guidance documents. The Public Health Agency of Canada will be posting regular updates and related documents at www.phac-aspc.gc.ca. The content of this document has been informed by discussion with and technical advice provided by the Infection Control Expert Advisory Group to PHAC.

At this time, the evidence suggests that the incubation period for H1N1 2009 is up to 7 days and individuals may remain infectious for up to 7 days. These timelines are similar to prior

experience with human swine influenza viruses. Spread of H1N1 2009 has been almost exclusively in the community setting to this point, and this is where most exposures for the general public and health care workers alike will occur. The clinical picture to date of human illness from H1N1 2009 is one of mild disease, however some will experience severe disease. H1N1 2009 is susceptible to the antiviral agents, oseltamivir and zanamivir, which represent therapeutic options for individuals in whom treatment is indicated. This information on morbidity and mortality and treatment options has been taken into account when updating this guidance. As noted above, as this virus spreads throughout the world, the clinical and epidemiological picture may change, requiring further modification to this guidance. **One goal of this revised guidance is using a risk assessment approach to support the use of PPE most appropriate to the risk associated with the care to be provided, thereby protecting limited resources for those situations where protection is most needed.**

Call Screening for Ambulance/Fire/Police (911) Dispatchers

The following criteria for influenza like illness (ILI) can be used to determine the need for applying the infection prevention and control measures found in this guidance:

Acute onset of respiratory illness with cough, with or without fever (in children under 5 years of age and adults 65 years of age and older fever may not be present with infection; additionally, fever has not been a consistent symptom with H1N1 2009; in children under 5 years of age GI symptoms may also be present)

And one or more of: sore throat, arthralgia, myalgia, or prostration

Dispatchers should :

- a. question callers to ascertain if there is anyone at the incident location who may have ILI due to H1N1 2009,
- b. communicate that risk to prehospital care providers prior to arrival at the incident location, and
- c. assign the appropriate First Responder to the call.

Organizations should review existing medical dispatch procedures and coordinate any modifications to meet this guidance with their Medical Director and in coordination with their Department of Health and/or other relevant Department.

In addition to Routine Practices, infection prevention and control measures for **all ILI cases suspected to be due to the HINI Flu Virus ILI** should include:

1. Source Control
2. Patient Assessment
3. Respiratory Hygiene (also known as Respiratory Cough Etiquette)
4. Hand Hygiene
5. Contact Precautions
6. Droplet Precautions/Respiratory Protection (Mask ¹/N95 Respirator; and eye or face protection)
7. Transportation
8. Cleaning and Disinfection of Vehicle and Equipment

Routine Practices and Additional Precautions as outlined below should be practiced with symptom onset and until symptoms have resolved. **A gown should be worn if there is a risk of the uniform becoming contaminated/soiled.**

1. Source Control:

The importance of applying engineering controls (e.g., vehicle ventilation, closed suctioning for the intubated patient) and administrative controls (e.g., enhanced screening for ILI, notifying the receiving facility of suspect ILI patients [see Transportation, #7]) as the first strategy in protecting prehospital care providers and others from exposure to infectious agents cannot be overemphasized. In conjunction with the measures below, prehospital care providers should complete an assessment of every emergency call's situation in regards to a) the physical setting and location (e.g. in the home, on the street/ road, in the ambulance, ability to establish 2 metre distance between ILI patients and others, etc.), and b) the type(s) of patient(s) being seen.

2. **Patient Assessment:**

Prehospital care personnel should be limited to those individuals necessary for patient assessment and care.

The suspect ILI case should be asked to wear a mask¹ if tolerated.

Prehospital care personnel should remain 2 metres from the patient during assessment if the patient's condition allows.

Emergent or urgent care is likely to require PPE to be applied prior to assessment (see 5. and 6.).

3. **Respiratory Hygiene (Respiratory Cough Etiquette):**

The patient with ILI symptoms should be asked to wear a mask¹ (if tolerated and feasible).

If a mask¹ is not tolerated or is not feasible, the patient with suspected ILI should be asked to cough/sneeze into his/her arm, shoulder or tissues and should be assisted to perform hand hygiene.

4. **Hand Hygiene**

Prehospital care personnel should perform hand hygiene frequently (as per the organization's policies) using either alcohol based hand rubs (60-90%) or soap and water.

5. **Contact Precautions:**

Prehospital care personnel should wear gloves.

Gloves should be removed following direct contact with the suspect ILI patient and hand hygiene should be performed.

6. **Droplet Precautions/Respiratory Protection (Mask¹/N95 Respirator; and eye or face protection):**

Prehospital care personnel should use droplet precautions/respiratory protection when within 2 metres of a suspected ILI patient. In many situations, the only option available is to use an N95 respirator for respiratory illness; however, if there is a choice to be made, the choice between droplet precautions (a mask¹) and respiratory protection (N95 respirator) should be based on the following:

A mask¹ should be worn:

- If within 2 metres of a suspect ILI patient.

An N95 respirator should be worn:

- If conducting an aerosol-generating medical procedure (AGMP) on a suspect ILI patient, all prehospital care personnel in the area should wear an N95 respirator. An AGMP includes any procedure carried out on a patient that can induce the production of aerosols of various sizes, including droplet nuclei. Examples include: non-invasive positive pressure ventilation (BIPAP, CPAP); endotracheal intubation; respiratory/airway suctioning; high-frequency oscillatory ventilation; tracheostomy care; aerosolized or nebulized medication administration.
- If indicated by local policy or supply

Whenever a mask¹ or N95 respirator is required, the prehospital care provider should also wear eye or face protection. Eye or face protection should be removed after leaving the patient's location and or area (e.g., patient's home, emergency department, bedside, ambulance) and disposed of in either a hands-free waste receptacle (if disposable) or in a separate receptacle to go for reprocessing (if reusable) as per organizational policy.

The mask¹ or N95 respirator should be removed by the straps, being careful not to touch the mask¹ or N95 respirator itself, after leaving the area and should be disposed of in a hands-free waste receptacle.

Prehospital care providers should perform hand hygiene before and after removing the droplet/respiratory protection and after leaving the patient's location and or area.

There is no indication for use of powered air-purifying respirators (PAPRs) in the care of patients with suspected ILI.

7. **Transportation*:**

The attending crew member(s) should leave PPE on for transport (with the exception of the driver).

The driver should remove all PPE after completing the suspected ILI patient's care and perform hand hygiene prior to entering driver cab.

Patients with suspected ILI should be transported separately. If multi-transport is necessary, only patients with similar exposure and symptoms should be transported together.

Patients with suspected ILI should wear a mask¹, if tolerated, during transport.

Patients should be transported with full ventilation as available in style of ambulance.

Full ventilation may include but not be limited to all windows closed and interior ventilation system and exhaust fan on.

If high concentration oxygen and/or positive pressure ventilation are required, appropriate oxygen delivery system should be filtered with an antimicrobial, hydrophobic filter.

When suctioning of intubated patients with suspected ILI is required, closed suctioning should be used when possible.

The receiving facility should be notified that a patient with suspected ILI is being transported to the facility.

The patient should remain in the vehicle with attending crew member until disposition of the patient is determined and the area is ready. Prehospital care personnel should not wait in the hall/ triage area with the patient.

At the hospital, the ambulance should be parked outside the hospital bay until a room is available for the patient. One crew member should remove his/ her PPE, perform hand hygiene, and report to triage.

8. **Cleaning and Disinfection of Vehicle and Equipment:**

After the call, routine vehicle cleaning/ disinfection should be performed as per organizational policy. Reusable equipment should be cleaned and disinfected before use on another patient as per organizational policy.

- **note that in circumstances where dedicated emergency medical vehicles are not available to facilitate transport (i.e., Remote or isolated communities) further consideration of interim measures may be required.**

Note:

1. A surgical mask or high quality procedure mask

References:

1. Public Health Agency of Canada website, posted June 8, 2009 at: <http://www.phac-aspc.gc.ca/alert-alerte/swine-porcine/surveillance-eng.php>
 2. Centers for Disease Control and Prevention, posted June 8, 2009 at: <http://www.cdc.gov/h1n1flu/update.htm>
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Appendix A

Point of Care Risk Assessment Tool for Pandemic (H1N1) 2009 Flu Virus

Prior to any patient interaction, all health care workers (HCWs) have a responsibility to always assess the infectious risk posed to themselves and to other patients, visitors, and HCWs. This risk assessment is based on professional judgement about the clinical situation and up-to-date information on how the specific healthcare organization has designed and implemented engineering and administrative controls, along with the availability and use of Personal Protective Equipment (PPE).

Point of Care Risk Assessment (PCRA) is an activity performed by the HCW **before every patient interaction**, to:

1. Evaluate the likelihood of exposure to H1N1 2009,
 - **from a specific interaction** (e.g., performing/ assisting with aerosol-generating medical procedures, other clinical procedures/ interaction, non-clinical interaction (i.e., admitting, teaching patient/ family), transporting patients, direct face-to-face interaction with patients, etc.),
 - **with a specific patient** (e.g., infants/ young children, patients not capable of self care/ hand hygiene, have poor-compliance with respiratory hygiene, copious respiratory secretions, frequent cough/ sneeze, early stage of influenza illness, etc.),
 - **in a specific environment** (e.g., single rooms, shared rooms/ washrooms, hallway, influenza assessment areas, emergency departments, public areas, therapeutic departments, diagnostic imaging departments, housekeeping, etc.),
 - **under available conditions** (e.g., air exchanges in a large waiting area or in an airborne infection isolation room, patient waiting areas);

AND

2. Choose the **appropriate actions/ PPE** needed to minimize the risk of patient, HCW/ other staff, visitor, contractor, etc. exposure to H1N1 2009 /suspect ILI case

PCRA is not a new concept, but one that is already performed regularly by professional HCWs many times a day for their safety and the safety of patients and others in the healthcare environment. For example, when a HCW evaluates a patient and situation to determine the possibility of blood or body fluid exposure or chooses appropriate PPE to care for a patient with an infectious disease, these actions are both activities of a PCRA.

References:

1. Health Canada, December 17, 2003. Infection Control Precautions for Respiratory Infections Transmitted by Large Droplet and Contact: Infection Control Guidance if there is a SARS Outbreak Anywhere in the World, When an Individual Presents to a Health Care Institution With a Respiratory Infection (Draft)
2. New York State Nursing Association (NYSNA), Nursing Practice Alert. Emergency Department Overcrowding/Preparedness. Website accessed May 2, 2009. http://www.nysna.org/practice/alerts/alert_1104.htm

The PCRA tool consists of tables 1 to 4.

A step-by-step description on how to use them follows :

Step 1: In Table 1, choose one of the physical setting and level of patient interaction options (in the highlighted column) using the description and example columns in the table.

Step 2: In Table 2, choose one of the patient clinical status and source control capability options (in the highlighted column) using the description and patient presentation column in the table.

Step 3: Using the matrix on Table 3, match the physical setting and level of patient interaction option from Table 1 (Step 1) with the patient clinical status and source control capability option identified from Table 2 (Step 2), to determine the appropriate level of precautions.

Step 4: From Table 4, determine what specific measures and personal protective equipment are indicated for the level of precautions identified in Table 3 (Step 3).

Table 1: Identification of the Physical Setting and Level of Patient Interaction

Physical Setting and Level of Patient Interaction	Description	Example
No Patient Interaction, Non-Clinical	Area with no patient access (restricted areas)	Non-clinical setting (medical record department, administrative office, central pharmacy, information technology office, central storage area, mail room, central maintenance areas, business office, etc.).
No Direct Patient Interaction and No Indirect Contact	No face-to-face interaction and no indirect contact with patients.	Hallways, cafeteria, public areas, clinical areas with no patient access (charting room, office, storage room, staff lounge, medication room, etc.), totally enclosed reception/triage areas with physical barrier between HCW and patient.
Indirect Contact	No direct patient interactions; Indirect contact only with patient environment or contaminated inanimate objects	Discharge patient room cleaning, equipment cleaning.
Direct Patient Interaction	Direct, face-to-face interaction with patient (within 2m of the patient)	Providing patient care, home care visit, assisting with Activity of Daily Living (ADL), diagnostic imaging, phlebotomy services, physiotherapy, occupational therapy, recreational therapy, intra-hospital transport/portering, non-enclosed triage/registration area, cleaning patient bedspace while occupied, routine ambulance or inter-facility transport.
Direct Patient Interaction with Potential for Aerosol Generation	Performing and/or assisting with Aerosol Generating Medical Procedures (AGMP)	Open endotracheal suctioning, bronchoscopy, endotracheal intubation, tracheostomy procedures, nebulized therapy, cardiopulmonary resuscitation.

Table 2: Identification of the Patient Clinical Status and Source Control Capability

Patient Clinical Status and Source Control Capability	Description	Patient Presentation
Recovered from Influenza	Patient recovered from influenza	Influenza-infected patient, beyond the known period of communicability
Influenza and Compliant or Weak Cough and Not Compliant	1) Patient with symptoms compatible with influenza with cough	Cough of any intensity and Adherence with respiratory hygiene Adherence to hand hygiene
	2) Patient with symptoms compatible with influenza with weak or no cough	Weak or no cough and Not adherent with respiratory hygiene Not adherent to hand hygiene
Influenza and Forceful Cough and Not Compliant	Patient with symptoms compatible with influenza	Forceful cough and Not adherent with respiratory hygiene Not adherent to hand hygiene
Influenza and AGMP	Patient with symptoms compatible with influenza	And an Aerosol Generation Medical Procedure (AGMP) is being performed

Note: If more than one risk level identified (e.g., multiple concurrent patient interactions), select the higher risk level.

Table 3: Level of Precautions Matrix

Patient Clinical Status and Source Control Capability	Physical Setting and Level of Patient Interaction				
	No Patient Interaction Non clinical	No Direct or Indirect Patient Interaction	Indirect Contact	Direct Patient Interaction	Direct Patient Interaction with AGMP
Recovered from Influenza	I	I	II	II	II
Influenza and Compliant or Weak Cough and Not Compliant	I	I	II	III	IV
Influenza and Forceful Cough and Not Compliant	I	I	II	III	IV
Influenza and AGMP	I	I	II	IV	IV

Note: It is anticipated that the majority of patients with H1N1 2009 will be cared for using level II and III and a minority would be cared for using level IV precautions.

Table 4 Personal Protective Equipment Suggested for the Level of Precautions for Human Cases of H1N1 2009

	Hand hygiene	Respiratory hygiene	N95 Respirator	Mask*	Eye Protection	Gown	Gloves
Level I	Yes	Yes	No Patient Contact – Not Required				
Level II	Yes	Yes	No, Except as per Additional Precautions*	As Per Routine Practices			
Level III	Yes	Yes	No, Except as per Additional Precautions*	Yes	Yes	As Per Routine Practices	
Level IV	Yes	Yes	Yes	No	Yes	As Per Routine Practices	

*Additional Precautions recommend an N95 respirator for known or suspected active tuberculosis or measles.

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