

# Infection prevention and control in health care for confirmed or suspected cases of pandemic (H1N1) 2009 and influenza-like illnesses

## Interim guidance

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## Background

On 11 June 2009, WHO raised its pandemic alert level from phase 5 to phase 6 and characterized the outbreak of pandemic (H1N1) 2009 as moderate. Since the first recorded cases in April 2009, the virus has spread rapidly across the globe resulting in sustained community transmission in numerous countries and at least two WHO regions.

Health-care facilities (HCF) face the challenge of providing care for patients infected with the pandemic (H1N1) 2009 virus. It is critical that health-care workers (HCW), patients, and visitors follow the appropriate infection control (IC) precautions in order to minimize the possibility of transmission associated with health care.

IC measures for pandemic (H1N1) 2009 should be in harmony with other IC measures and strategies in health care. It is particularly important to acknowledge and quickly identify other respiratory diseases that may require different IC measures (e.g. pulmonary tuberculosis) and that have the potential for being overlooked due to large numbers of patients with respiratory symptoms.

Human-to-human transmission of the pandemic (H1N1) 2009 virus appears to be primarily through droplets. Therefore, IC precautions for patients with suspected or confirmed pandemic (H1N1) 2009 virus infection, as well as those with influenza-like symptoms or illnesses, should ensure control of the spread of respiratory droplets. The document "Infection prevention and control of epidemic- and pandemic-prone acute respiratory diseases in health care - WHO Interim Guidelines"<sup>1</sup> provides detailed information on infection prevention and control precautions for influenza virus with sustained human-to-human transmission applicable for the current pandemic (H1N1) 2009. This guidance note summarizes and highlights the main issues contained in the aforementioned document.

This document has been developed to meet the urgent need for guidance and the recommendations are only valid until new guidance becomes available, at the latest until the end of 2009.

## Fundamentals of infection prevention strategies

Administrative controls are key components in infection prevention strategies and include implementation and facilitation of IC precautions; patient triage for early detection, patient placement and reporting; organization of services; policies on rational use of available supplies; policies on patient procedures; and strengthening of IC infrastructure.

Environmental/engineering controls, such as basic HCF infrastructure,<sup>2</sup> adequate environmental ventilation, proper patient placement and adequate environmental cleaning can help reduce the spread of some pathogens during health care.

Rational use of available personal protective equipment (PPE) and appropriate hand hygiene also help reduce spread of infection.<sup>3</sup>

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<sup>1</sup> Infection prevention and control of epidemic- and pandemic-prone acute respiratory diseases in health care WHO Interim Guidelines. WHO, 2007. Available at [http://www.who.int/csr/resources/publications/WHO\\_CD\\_EPR\\_2007\\_6/en/index.html](http://www.who.int/csr/resources/publications/WHO_CD_EPR_2007_6/en/index.html).

<sup>2</sup> Essential environmental health standards in health care. WHO, 2008. Available at [http://whqlibdoc.who.int/publications/2008/9789241547239\\_eng.pdf](http://whqlibdoc.who.int/publications/2008/9789241547239_eng.pdf).

## Critical infection control measures

Several measures are recommended in the context of pandemic (H1N1) 2009 and other epidemics. First, avoid crowding patients together (maintain a minimum distance of  $\geq 1$  metre between patients). Second, promote respiratory etiquette and hand hygiene by providing necessary supplies and training individuals in the proper use of medical masks and hand hygiene immediately after contact with respiratory secretions. Third, apply Standard<sup>4</sup> and Droplet<sup>5</sup> Precautions. Last, consider special arrangements for vulnerable groups at high risk<sup>6</sup> for complications from pandemic (H1N1) 2009 viral infection.

## Summary of infection control precautions in specific situations

### 1. Caring for patients with suspected or confirmed infection

For staff providing care for patients with suspected or confirmed pandemic (H1N1) 2009 infection and for patients with influenza-like symptoms, the following precautions should be taken.

#### 1.1 When working in direct contact with patients, Standard and Droplet Precautions should always be applied.

##### As per Droplet Precautions:

- wear a medical mask, if working within or  $> 1$  metre of the patient.
- emphasize hand hygiene before and after patient contact, and immediately after removal of mask.

**As per Standard Precautions**, for procedures with a risk for splashes onto the face and body, PPE<sup>7</sup> should include the use of:

- facial protection (either a medical mask and eye-visor or goggles, or a face shield).
- a gown and clean gloves; and
- hand hygiene before and after patient contact, and after PPE removal.

#### 1.2 When performing aerosol-generating procedures (e.g. aspiration of respiratory tract, intubation, resuscitation, bronchoscopy, autopsy), health-care providers should be aware that these procedures have been associated with increased risk of infection transmission and IC precautions should include the following:

- wear a facial particulate respirator (e.g. EU FFP2, US NIOSH-certified N95), eye protection (i.e. goggles or a face shield); a clean, non-sterile, long-sleeved gown; and gloves (some of these procedures require sterile gloves);
- perform procedures in an adequately ventilated room ( $> 12$  air changes per hour);
- avoid permitting unnecessary individuals into the room; and
- perform hand hygiene before and after patient contact, and after PPE removal.

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<sup>3</sup> WHO Guidelines on Hand Hygiene in Health Care. WHO 2009. Available at [http://whqlibdoc.who.int/publications/2009/9789241597906\\_eng.pdf](http://whqlibdoc.who.int/publications/2009/9789241597906_eng.pdf).

<sup>4</sup> Standard Precautions: Basic precautions designed to minimize direct, unprotected exposure to potentially infected blood, body fluids or secretions applicable to all patients. Available at [www.who.int/csr/resources/publications/standardprecautions/en/index.html](http://www.who.int/csr/resources/publications/standardprecautions/en/index.html).

<sup>5</sup> PPE for Droplet Precautions: Health-care workers to wear medical mask if working within approximately 1 meter of the patient.

<sup>6</sup> Groups at high risk: Infants and young children  $< 5$  years, the elderly ( $> 65$  years), nursing home residents, pregnant women, and patients with co-morbid conditions such as cardiovascular, respiratory or liver disease, diabetes, and those with immunosuppression related to malignancy, HIV infection or other diseases.

<sup>7</sup> Details on the correct use of PPE are available at:

[http://www.who.int/csr/resources/publications/WHO\\_CD\\_EPR\\_2007\\_6/en/index.html](http://www.who.int/csr/resources/publications/WHO_CD_EPR_2007_6/en/index.html)

## 2. Collection of laboratory specimens<sup>8</sup>

Upper respiratory tract specimens are the most appropriate samples for laboratory testing of pandemic (H1N1) 2009 virus in humans. Samples should be taken from the deep nostrils (nasal swab), nasopharynx (nasopharyngeal swab), nasopharyngeal aspirate, and/or throat or bronchial aspirate. Blood samples may be used for serologic purposes (either during the acute or convalescent phases). In addition to Standard Precautions, specific IC precautions should be taken when collecting patient specimens as follows.

### 2.1 Nasal swab and nasal wash:

- use face protection (either a medical mask and eye-visor or goggles, or a face shield);
- wear a gown and clean gloves; and
- perform hand hygiene before and after patient contact, and immediately after removal of PPE.

### 2.2 Collection of nasopharyngeal aspirate, nasopharyngeal swab, throat swab or bronchial aspirate<sup>9</sup>:

- follow the same precautions as for **Aerosol generating procedures** (above).

### 2.3 For the collection of blood:

- use a medical mask (if performed during the acute infectious phase);
- use clean gloves;
- perform hand hygiene before and after patient contact, and immediately after removal of PPE.

## 3. Infection control precautions for patient care in regions where both avian influenza A (H5N1) and pandemic (H1N1) 2009 have been reported

Patients presenting with influenza-like illness (ILI) might be infected with different types of influenza virus (e.g. avian influenza A (H5N1) or pandemic (H1N1) 2009), as well as other respiratory pathogens. Epidemiological and clinical<sup>10</sup> clues should be used in triage areas to identify and apply the appropriate infection prevention and control measures in accordance with the most likely diagnosis. Laboratory diagnosis should be pursued for etiological clarification. A laboratory confirmed diagnosis is not always available or might be delayed, but clinical clues and epidemiological link(s), such as contact with infected patients or animal exposures, can aid in the presumptive diagnosis of avian influenza A (H5N1) and pandemic (H1N1) 2009. For laboratory confirmed or suspect cases of avian influenza A (H5N1) infection, Standard plus Droplet plus Contact<sup>11</sup> Precautions and eye protection should be applied when providing routine care.<sup>12</sup>

## KEY ELEMENTS FOR INFECTION PREVENTION IN HEALTH CARE

### 1. Basic infection control recommendations for all health-care facilities

Standard and Droplet Precautions should be used when caring for a patient with an acute, febrile, respiratory illness.

### 2. Respiratory hygiene/cough etiquette

Health-care workers, patients and family members should cover their mouth and nose with a

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<sup>8</sup> WHO Information for Laboratory Diagnosis of New Influenza A (H1N1) Virus in Humans. WHO, 2009. Available at [http://www.who.int/csr/resources/publications/swineflu/diagnostic\\_recommendations/en/index.html](http://www.who.int/csr/resources/publications/swineflu/diagnostic_recommendations/en/index.html).

<sup>9</sup> Aspiration of the respiratory track may be associated with increased risk for disease transmission. Nasopharyngeal swabbing and the vigorous swabbing of tonsils for sample collection may trigger intense cough at very close distance to the person doing the procedure.

<sup>10</sup> Clinical management of human infection with avian influenza A (H5N1) virus. WHO, 2007. Available at [http://www.who.int/csr/disease/avian\\_influenza/guidelines/clinicalmanage07/en/index.html](http://www.who.int/csr/disease/avian_influenza/guidelines/clinicalmanage07/en/index.html)

<sup>11</sup> PPE for Contact Precautions: Health-care workers should wear gowns and clean gloves when providing direct care.

<sup>12</sup> IC recommendations for avian influenza in health-care facilities is available at: [http://www.who.int/csr/disease/avian\\_influenza/guidelines/aidememoireinfcont/en/index.html](http://www.who.int/csr/disease/avian_influenza/guidelines/aidememoireinfcont/en/index.html).

disposable tissue when coughing, then discard the tissue in a receptacle and perform hand hygiene afterwards.

3. **Triage, early recognition and reporting of pandemic (H1N1) infection**  
Consider assessing pandemic (H1N1) 2009 virus infection in patients with acute, febrile, respiratory illness in places where community-level spread is occurring or in patients who have been in an affected region within one week prior to symptom onset and who have been exposed to pandemic (H1N1) 2009 by an infected patient.<sup>13</sup>
4. **Placement of suspected and confirmed pandemic (H1N1) 2009 infected patients**  
Place patients with the same diagnosis in wards keeping at least 1 metre distance between beds.<sup>14</sup> All persons entering the isolation area should adhere to Standard and Droplet Precautions. For health services targeting healthy populations, such as pregnant women, children attending immunization services or regular check-ups, measures must be taken to avoid exposing healthy people to suspected or confirmed cases.
5. **Additional measures to reduce pandemic (H1N1) 2009 virus transmission associated with health care**  
Limit the number of health-care workers/family members/visitors exposed to the pandemic (H1N1) 2009 patient. Implement rooming-in policies to keep mothers and babies together.
6. **Specimen transport/handling within health-care facilities**  
Follow applicable transport regulations and requirements and use Standard Precautions for specimen transport to the laboratory. Health-care facility laboratories should follow good biosafety practices.<sup>15</sup>
7. **Family member/visitor recommendations**  
Family members/visitors should be limited to those essential for patient support and should use the same IC precautions as health-care workers.
8. **Patient transport within health-care facilities**  
Suspected or confirmed pandemic (H1N1) 2009 patients should wear a medical mask or cover their cough and practice appropriate hand hygiene while being transported within health-care facilities.
9. **Pre-hospital care** (e.g. transportation to hospital).  
When transporting patients to hospital, IC precautions are similar to those practiced during hospital care for all involved in the care of suspected pandemic (H1N1) 2009 patients.
10. **Occupational health**  
Monitor health of health-care workers exposed to pandemic (H1N1) 2009 patients. Health-care workers with symptoms should stay at home. Vulnerable groups at high risk for complications of pandemic (H1N1) 2009 infection should carefully follow recommended infection-control measures. In addition, alternatives such as reassignment to other duties should be considered. Antiviral prophylaxis should follow local policy.
11. **Waste disposal**  
Standard Precautions should be used when handling and disposing of sharps and contaminated items.
12. **Dishes/eating utensils**  
Wash using routine procedures with water and detergent. Use non-sterile rubber gloves.
13. **Linen and laundry**  
Wash with routine procedures, water and usual detergent; avoid shaking linen/laundry during handling before washing. Wear non-sterile rubber gloves.
14. **Environmental cleaning**  
Ensure that appropriate and regular cleaning is performed with water and usual detergent on soiled and/or frequently touched surfaces (e.g. door handles).
15. **Patient care equipment**  
Ensure cleaning and disinfection of reusable equipment between patients.<sup>2</sup>

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<sup>13</sup> Interim WHO guidance for the surveillance of human infection with swine influenza A (H1N1) virus. WHO, 2009. Available at: [http://www.who.int/csr/disease/swineflu/WHO\\_case\\_definition\\_swine\\_flu\\_2009\\_04\\_29.pdf](http://www.who.int/csr/disease/swineflu/WHO_case_definition_swine_flu_2009_04_29.pdf)

<sup>14</sup> Mothers and newborn infants should be kept together unless absolutely necessary. The benefits of not separating a mother and her newborn baby and of breastfeeding outweigh the potential risks.

<sup>15</sup> Laboratory Biosafety Manual - Third Edition. WHO, 2004. Available at: [http://www.who.int/csr/resources/publications/biosafety/WHO\\_CDS\\_CSR\\_LYO\\_2004\\_11/en/index.html](http://www.who.int/csr/resources/publications/biosafety/WHO_CDS_CSR_LYO_2004_11/en/index.html).

16. **Duration of pandemic (H1N1) 2009 infection control precautions**  
Until further information becomes available, IC precautions should be practiced for seven days from the onset of symptoms. For prolonged illness with complications (i.e. pneumonia), control measures should be used during the duration of acute illness. Children may shed the virus longer than adults, and personal hygiene and separation from immunologically naive family members is recommended for at least one week after the resolution of fever.
17. **Patient discharge**  
If the pandemic (H1N1) 2009 patient is still infectious upon hospital discharge (i.e. discharged within the period of IC precautions: see 16 above), instruct family members on appropriate IC precautions in the home.
18. **Prioritization of PPE when supplies are limited**  
Medical masks and hand hygiene supplies should be prioritized for the care of all pandemic (H1N1) 2009 patients.
19. **Health-care facility (HCF) engineering controls**  
The HCF spaces should be well ventilated. Aerosol-generating procedures should be performed in adequately-ventilated rooms ( $\geq 12$  air changes per hour).
20. **Mortuary care**  
Mortuary staff and the burial team should apply Standard Precautions, i.e. perform proper hand hygiene and use appropriate PPE according to the risk of exposure to body fluids (e.g. gown, gloves, and facial protection if there is a risk of splashes from patient's body fluids/secretions onto staff member's body and face).
21. **Health-care facility managerial activities**  
Development of procedures to ensure proper implementation of administrative controls, environmental controls and use of PPE, including adequate staffing and supplies, training of staff, education of patients and visitors and a strategy for risk communication.
22. **Health care in the community**  
Limit contact with the person with influenza-like symptoms as much as possible. If close contact is unavoidable, use the best available protection against respiratory droplets and perform hand hygiene.