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## Interim Guidance on Infection Control Measures for 2009 H1N1 Influenza in Healthcare Settings, Including Protection of Healthcare Personnel

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*CDC is releasing updated interim guidance on infection control measures to prevent transmission of 2009 H1N1 influenza in healthcare facilities. The updated guidance applies uniquely to the special circumstances of the current 2009 H1N1 pandemic and will be updated as necessary as new information becomes available throughout the course of this influenza season. It provides general guidance for all healthcare facilities. The updated guidance expands on earlier guidance by emphasizing that successfully preventing transmission requires a comprehensive approach, beginning with pandemic planning that includes developing written plans that are flexible and adaptable should changes occur in the severity of illness or other aspects of 2009 H1N1 and seasonal influenza. Revisions from earlier guidance include: criteria for identification of suspected influenza patients; recommended time away from work for healthcare personnel; changes to isolation precautions based on tasks and anticipated exposures; expansion of information on the hierarchy of controls which ranks preventive interventions in the following order of preference: elimination of exposures, engineering controls, administrative controls, and personal protective equipment; and changes to guidance on use of respiratory protection.*

### Definition of healthcare personnel

For the purposes of this guidance, healthcare personnel are defined as all persons whose occupational activities involve contact with patients or contaminated material in a healthcare, home healthcare, or clinical laboratory setting. Healthcare personnel are engaged in a range of occupations, many of which include patient contact even though they do not involve direct provision of patient care, such as dietary and housekeeping services. This guidance applies to healthcare personnel working in the following settings: acute care hospitals, nursing homes, skilled nursing facilities, physician's offices, urgent care centers, outpatient clinics, and home healthcare agencies. It also includes those working in clinical settings within non-healthcare institutions, such as school nurses or personnel staffing clinics in correctional facilities. The term "healthcare personnel" includes not only employees of the organization or agency, but also contractors, clinicians, volunteers, students, trainees, clergy, and others who may come in contact with patients.

### Background

More communities are being affected by 2009 H1N1 influenza in fall/winter 2009-2010 than were in spring/summer 2009. Seasonal influenza viruses may also cause illness this fall and winter, possibly at the same time that 2009 H1N1 virus outbreaks are occurring. Although the severity, amount and timing of illness that 2009 H1N1 influenza and seasonal influenza will cause is uncertain, as with any influenza season, some people will require medical care as a result of their influenza virus infections. In view of these and other uncertainties, healthcare facilities will need to be ready to adjust their pandemic influenza plans as dictated by changing conditions. Staff in healthcare settings should monitor the CDC <http://www.cdc.gov/h1n1flu> and state and local health department websites for the latest information.

### Symptoms of Influenza and Viral Shedding

The symptoms of influenza, including 2009 H1N1 influenza, can include fever, cough, sore throat, runny or stuffy nose, body aches, headache, chills, fatigue, nausea, diarrhea, and vomiting. Depending on the case series, the proportion of persons who have laboratory confirmed 2009 H1N1 infection and do not have fever can range from about 10 to 50%. Because influenza symptoms are nonspecific, it can be difficult to determine if a person has influenza based on symptoms alone. Nonetheless, decisions for clinical management, particularly for outpatients, in most cases can be made on the basis of clinical and epidemiological information. Information on diagnostic testing for 2009 H1N1 viral infection can be found at <http://www.cdc.gov/h1n1flu>.

In general, the incubation period for influenza is estimated to range from 1 to 4 days with an average of 2 days. Influenza virus shedding (the time during which a person might be infectious to another person) begins the day before illness onset and can persist for 5 to 7 days, although some persons may shed virus for longer periods, particularly young children and severely immunocompromised persons.

The amount of virus shed is greatest in the first 2-3 days of illness and appears to correlate with fever, with higher amounts of virus shed when temperatures are highest.

#### Modes of 2009 H1N1 Influenza Transmission

2009 H1N1 influenza virus appears to be transmitted from person to person through close contact in ways similar to other influenza viruses. Although the relative contribution of each mode is uncertain, influenza virus can potentially be transmitted through:

- Droplet exposure of mucosal surfaces (e.g., nose, mouth, and eyes) by respiratory secretions from coughing or sneezing;
- Contact, usually of hands, with an infectious patient or fomite (a surface that is contaminated with secretions) followed by self-inoculation of virus onto mucosal surfaces such as those of the nose, mouth, and eyes; and
- Small particle aerosols in the vicinity of the infectious individual.

Transmission of influenza through the air over longer distances, such as from one patient room to another, is thought not to occur. All respiratory secretions and bodily fluids, including diarrheal stools, of patients with 2009 H1N1 influenza are considered to be potentially infectious.

### GENERAL RECOMMENDATIONS

#### Review Pandemic Plans for the 2009-2010 Fall/Winter Influenza Season

Facilities should review and, if not already in place, develop written pandemic influenza plans anticipating widespread transmission of 2009 H1N1 influenza in communities. CDC, with input from other federal partners, has developed checklists (<http://pandemicflu.gov/professional/hospital/>) to help healthcare facilities in their planning and preparedness for pandemic influenza. OSHA has also developed detailed guidance for healthcare settings

([http://www.osha.gov/Publications/OSHA\\_pandemic\\_health.pdf](http://www.osha.gov/Publications/OSHA_pandemic_health.pdf)). Links to specific checklists and other planning resources are provided in the Appendix. Facilities should also check with state and local health departments for local guidance. During the planning process, facilities should review their work areas and job tasks to identify workers who will routinely be in close contact with influenza patients so that preventive strategies can be targeted and exposure that is not essential can be limited. Facilities also should consider their own unique circumstances and needs that may not be addressed in guidance documents. Planning committees can facilitate this process. Strong sustained management commitment and active worker participation in a comprehensive, coordinated prevention program are extremely important in promoting implementation of, and adherence to, prevention recommendations.

#### Use a Hierarchy of Controls to Prevent Influenza Transmission in Healthcare Settings

Facilities should use a hierarchy of controls approach to prevent exposure of healthcare personnel and patients and prevent influenza transmission within healthcare settings. The hierarchy of controls to protect workers from occupational injury or illness places preventive interventions in groups that are ranked according to their likely effectiveness in reducing or removing the source of exposure. To apply the hierarchy of controls to prevention of influenza transmission, facilities should take the following steps, in order of preference:

1. *Elimination of potential exposures:* Eliminating the potential source of exposure ranks highest in the hierarchy of controls. Examples of interventions in this category include: taking steps to minimize outpatient visits for patients with mild influenza-like illness who do not have risk factors for complications, postponing elective visits by patients with suspected or confirmed influenza until they are no longer infectious, and denying entry to visitors who are sick.
2. *Engineering controls:* Engineering controls rank second in the hierarchy of controls. They are particularly effective because they reduce or eliminate exposures at the source and many can be implemented without placing primary responsibility of implementation on individual employees. In addition, these controls can protect patients as well as personnel. Examples of engineering controls include installing partitions in triage areas

and other public spaces, to reduce exposures by shielding personnel and other patients; and using closed suctioning systems for airways suction in intubated patients.

3. *Administrative controls*: Administrative controls are required work practices and policies that prevent exposures. As a group, they rank third in the hierarchy of controls because their effectiveness is dependent on consistent implementation by management and employees. Examples of administrative controls include promoting and providing vaccination; enforcing exclusion of ill healthcare personnel, implementing respiratory hygiene/cough etiquette strategies; and setting up triage stations and separate areas for patients who visit emergency departments with influenza-like illness, managing patient flow, and assigning dedicated staff to minimize the number of healthcare personnel exposed to those with suspected or confirmed influenza.
4. *Personal protective equipment (PPE)*: PPE ranks lowest in the hierarchy of controls. It is a last line of defense for individuals against hazards that cannot otherwise be eliminated or controlled. While providing personnel with appropriate PPE and education in its use is important, effectiveness of PPE is dependent on a number of factors. PPE is effective only if used throughout potential exposure periods. PPE will not be effective if adherence is incomplete or when exposures to infectious patients or ill co-workers are unrecognized. In addition, PPE must be used and maintained properly, and must function properly, to be effective.


Careful attention to elimination of potential exposures, engineering controls, and administrative controls will reduce the need to rely on PPE, including respirators. This is an especially important consideration during the current year, when shortages of respirators have already been reported by many healthcare facilities.

It should be recognized that individual interventions may have a level of importance different from that suggested by their classification within the hierarchy of controls. For example, vaccination is an administrative control that depends upon the actions of both management and employees. However, vaccination is one of the most important interventions for preventing transmission of influenza to healthcare personnel. Its ability to prevent influenza transmission in both work and community settings is especially important, because influenza is a community-based infection that is transmitted in household and community settings. Other interventions that work in healthcare settings alone will not prevent such transmission.

Examples of preventive interventions that can be used to prevent or reduce influenza infections, grouped according to the hierarchy of controls, are provided in Table 1.

## **SPECIFIC RECOMMENDATIONS**

### *Promote and administer the 2009 H1N1 influenza and seasonal influenza vaccines*

Healthcare and emergency medical services personnel are among the priority groups recommended to receive the 2009 H1N1 influenza vaccine. (See <http://www.cdc.gov/h1n1flu/vaccination/acip.htm>.) To improve adherence, vaccination should be offered to healthcare personnel free of charge and during working hours. Vaccination campaigns with incentives such as lotteries with prizes should be considered. Healthcare facilities should require personnel who refuse vaccination to complete a declination form. The Veterans Health Administration Influenza Manual is a useful source of information on best practices and strategies for increasing immunization rates. (See [http://www1.va.gov/vhapublications/ViewPublication.asp?pub\\_ID=1978](http://www1.va.gov/vhapublications/ViewPublication.asp?pub_ID=1978) )

It is not anticipated that the seasonal influenza vaccine will provide protection against the 2009 H1N1 influenza virus. However, it is anticipated that seasonal influenza viruses will also be present in the U.S. during the 2009-2010 influenza season. Influenza vaccination is effective against these seasonal viruses and should continue to be provided to healthcare personnel and given to unvaccinated patients. (See <http://www.cdc.gov/flu/professionals/acip/>.)

### *Enforce respiratory hygiene and cough etiquette*

In addition to limiting numbers of ill people in the facility (e.g., by access control), respiratory hygiene and cough etiquette infection control measures (See <http://www.cdc.gov/flu/professionals/infectioncontrol/resphygiene.htm>) should be

incorporated into infection control practices as part of Standard Precautions to prevent the transmission of all respiratory infections including 2009 H1N1 influenza. This form of source control should be implemented by everyone in healthcare settings - patients, visitors, and staff alike. Respiratory hygiene and cough etiquette procedures should continue to be followed for the entire duration of stay.

*Establish facility access control measures and triage procedures*

- Establish non-punitive policies that encourage or require ill health care personnel workers to stay home. This should include contractors as well as staff.
- Post signage at entry points instructing patients and visitors about hospital policies, including the need to notify staff immediately if they have signs and symptoms of influenza.
- Establish mechanisms to identify patients with symptoms of respiratory illness at any point of entry to the facility. Provisions should be made for symptomatic patients to cover their nose and mouth with tissues when coughing or sneezing, or put on facemasks for source control, if tolerated, and for their prompt isolation and assessment. Information on diagnostic testing of patients for 2009 H1N1 influenza infection can be found at <http://www.cdc.gov/h1n1flu>
- Establish triage procedures and engineering controls (e.g., partitions) that separate ill and well patients and limit the need for PPE use by staff.
- Consider limiting points of entry to the facility.


*Manage visitor access and movement within the facility*

Establish procedures for managing visitors to include:

- Limiting visitors for patients in isolation for influenza to persons who are necessary for the patient's emotional well-being and care. Visitors who have been in contact with the patient before and during hospitalization are a possible source of influenza for other patients, visitors, and staff.
- Scheduling and controlling visits to allow for:
  - Screening for symptoms of acute respiratory illness before entering the hospital.
  - Instruction, before entering the patient's room, on hand hygiene, limiting surfaces touched, and use of PPE according to current facility policy while in the patient's room.
  - Visitors should not be present during aerosol-generating procedures.
  - Visitors should be instructed to limit their movement within the facility.

*Establish policies and procedures for patient placement and transport*

Any patient with respiratory illness consistent with influenza should promptly be asked to wear a facemask for source control, if tolerated, or cover their nose and mouth with tissues when coughing or sneezing, and placed directly in an individual room with the door kept closed, where medically appropriate. The precautions required for entry into patient rooms should be posted on the door. Once placed in rooms, patients with suspected or confirmed 2009 H1N1 influenza should be encouraged to practice respiratory hygiene and cough etiquette when they are coughing or sneezing throughout their duration of stay.

- When a single patient room is not available, consultation with infection control personnel is recommended to assess the risks associated with other patient placement options (e.g., cohorting, keeping the patient with an existing roommate). (See <http://www.cdc.gov/ncidod/dhqp/pdf/guidelines/Isolation2007.pdf>  for additional information on cohorting, including other factors that may affect cohorting decisions.)

*Follow current facility procedures for transport and movement of patients under isolation precautions, including:*

- Communicating information about patients with suspected, probable or confirmed influenza to appropriate personnel before transferring them to other departments in the facility (e.g., radiology, laboratory) and to other facilities.
- Limiting patient transport and movement of patients outside of the room to medically necessary purposes and minimizing waiting times and delays associated with transport and procedures conducted outside the patient's room.
- Providing influenza patients with facemasks to wear for source control, as tolerated, and tissues to contain secretions when outside of their room.
- Encouraging patients who are able to perform hand hygiene to do so frequently and to follow respiratory hygiene and cough etiquette practices.
- Providing portable x-ray equipment in cohort areas to reduce the need for patient transport.

*Limit the number of healthcare personnel entering the isolation room*

- Healthcare personnel entering the room of a patient in isolation should be limited to those truly necessary for performing patient care activities.

*Apply isolation precautions*

The following isolation precautions are recommended for healthcare personnel who are in close contact with patients with suspected or confirmed 2009 H1N1 influenza. **For the purposes of this document, close contact is defined as working within 6 feet of the patient or entering into a small enclosed airspace shared with the patient (e.g., average patient room):**

- Standard Precautions - For all patient care, use nonsterile gloves for any contact with potentially infectious material, followed by hand hygiene immediately after glove removal; use gowns along with eye protection for any activity that might generate splashes of respiratory secretions or other infectious material. (See [http://www.cdc.gov/ncidod/dhqp/gl\\_isolation\\_standard.html](http://www.cdc.gov/ncidod/dhqp/gl_isolation_standard.html).)

Respiratory Protection –

Recommendation: CDC continues to recommend the use of respiratory protection that is at least as protective as a fit-tested disposable N95 respirator for healthcare personnel who are in close contact with patients with suspected or confirmed 2009 H1N1 influenza. This recommendation applies uniquely to the special circumstances of the current 2009 H1N1 pandemic during the fall and winter of 2009-2010 and CDC will continue to revisit its guidance as new information becomes available, within this season if necessary


Basis: The current recommendation is based on the unique conditions associated with the current pandemic, including low levels of population immunity to 2009 H1N1 influenza, availability of vaccination programs well after the start of the pandemic, susceptibility to infection of those in the age range of healthcare personnel, increased risk for complications of influenza in some healthcare personnel (e.g., pregnant women), and the potential for healthcare personnel to be exposed to 2009 H1N1 influenza patients because of their occupation.

Supply considerations: CDC recognizes that some facilities are currently experiencing shortages of respiratory protection equipment and that further shortages are anticipated. Although the exact total supply in the public and private sectors is not known, a large gap between supply and demand is predicted. In the face of shortages, appropriate selection and use of respiratory protection is critical. A key strategy is to use source control, engineering, and administrative measures to reduce the numbers of workers who come in contact with patients who have influenza-like illness in order to reduce the consumption of respiratory protection equipment. For example, combining the use of triage procedures and use of partitions or other engineering controls might reduce exposures and the need for PPE. Other strategies could include taking steps to either reduce consumption of disposable N95 filtering facepiece respirators or extend their use. Some facilities that are experienced in their use may also be able to use alternative PPE for certain applications including more protective filtering facepiece respirators, reusable elastomeric tight-fitting respirators, and reusable powered air-purifying respirators

(PAPRs). For facilities that are able to use alternatives such as elastomeric respirators or PAPRs, processes must be in place to ensure that they are used properly and are reliably decontaminated. Additional information about these strategies, including frequently asked questions, are posted on the CDC 2009 H1N1 website (see <http://www.cdc.gov/h1n1flu>).

Special care should be taken to ensure that respirators are available for situations where respiratory protection is most important, such as performance of aerosol-generating procedures on patients with suspected or confirmed 2009 H1N1 influenza or provision of care to patients with other infections for which respiratory protection is strongly indicated (e.g., tuberculosis).

**Prioritized respirator use:** Where a shortage of respirators exists despite reasonable efforts to obtain and maintain a sufficient supply for anticipated needs, in particular for very high exposure risk situations such as some aerosol-generating procedures (listed below), a facility should consider shifting to a prioritized respirator use mode. In this mode, respirator use is prioritized to ensure availability for healthcare personnel at most risk from 2009 H1N1 influenza exposure. Even under conditions of prioritized use, personnel attending aerosol-generating procedures on patients with suspected or confirmed 2009 H1N1 influenza should always use respiratory protection at least as protective as fitted N95 respirators. An example of prioritization for personnel not attending aerosol-generating procedures is shown in Table 2. Prioritization should be adapted to local conditions and should consider intensity and duration of exposure, personal health risk factors for complications of infection, and vaccination status. When in prioritized respirator use mode, respirator use may be temporarily discontinued for employees *at lower risk of exposure to 2009 H1N1 influenza or lower risk of complicated infection*. Gathering of personal information for the purposes of pandemic planning and response must be done in a fashion that is compliant with all applicable rules and regulations, including the Americans with Disabilities Act (ADA):

[http://www.eeoc.gov/facts/h1n1\\_flu.html](http://www.eeoc.gov/facts/h1n1_flu.html) . Contingency crisis planning is critical to efficient implementation of prioritized use during supply shortages. In making decisions about prioritization, facilities should consider needs for managing patients with diseases other than influenza that require respiratory protection (e.g. tuberculosis) and also considerations related to the timetable for obtaining more respirators. To assure that respirators are likely to be available for the most important uses, facilities should maintain a reserve sufficient to meet the estimated needs for performing aerosol-generating procedures and for managing patients with diseases other than influenza that require respiratory protection until supplies are expected to be replenished.

**Facemasks for healthcare personnel who are not provided a respirator due to the implementation of prioritized respirator use:** If a facility is in prioritized respirator use mode and unable to provide respirators to healthcare personnel who provide care to suspected and confirmed 2009 H1N1 influenza cases, the facility should provide those personnel with facemasks. Facemasks that have been cleared for marketing by the U.S. Food and Drug Administration have been tested for their ability to resist blood and body fluids, and generally provide a physical barrier to droplets that are expelled directly at the user. Although they do not filter small particles from the air and they allow leakage around the mask, they are a barrier to splashes, droplet sprays, and autoinoculation of influenza virus from the hands to the nose and mouth. Thus, they should be chosen over no protection. Routine chemoprophylaxis is not recommended for personnel wearing facemasks during the care of patients with suspected or confirmed 2009 H1N1 influenza.

#### *Hand Hygiene*

- Healthcare personnel should perform hand hygiene frequently, including before and after all patient contact, contact with respiratory secretions, and before putting on and upon removal of PPE. Soap and water or alcohol-based hand sanitizers should be used. (See <http://www.cdc.gov/Handhygiene/>.)

### *Aerosol-generating procedures*

Some procedures performed on patients are more likely to generate higher concentrations of respiratory aerosols than coughing, sneezing, talking, or breathing, presenting healthcare personnel with an increased risk of exposure to infectious agents present in the aerosol. Although there are limited objective data available on disease transmission related to such aerosols, many authorities view the following procedures as being very high exposure risk aerosol-generating procedures for which special precautions should be used:

- Bronchoscopy
- Sputum induction
- Endotracheal intubation and extubation
- Open suctioning of airways
- Cardiopulmonary resuscitation
- Autopsies

Although some have suggested that administration of nebulized medications (due to risk of inducing cough), acquisition of nasopharyngeal swabs/samples, and use of high-flow oxygen might create infectious aerosols of concern, less is known about the magnitude or potential for exposure.

A combination of measures should be used to reduce exposures from high-risk aerosol-generating procedures, including:

- Only perform these procedures on patients with suspected or confirmed influenza if they are medically necessary and cannot be postponed.
- Limit the number of healthcare personnel present during the procedure to only those essential for patient care and support.
- Conduct the procedures in an airborne infection isolation room (AIIR) when feasible. Such rooms are designed to reduce the concentration of infectious aerosols and prevent their escape into adjacent areas using controlled air exchanges and directional airflow. They are single patient rooms at negative pressure relative to the surrounding areas, and with a minimum of 6 air changes per hour (12 air changes per hour are recommended for new construction or renovation). Air from these rooms should be exhausted directly to the outside or be filtered through a high efficiency particulate air (HEPA) filter before recirculation. Room doors should be kept closed except when entering or leaving the room, and entry and exit should be minimized during and shortly after the procedure. Facilities should monitor and document the proper negative-pressure function of these rooms. (See: <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5417a1.htm>.)
- Portable HEPA filtration units may be used to further reduce the concentration of contaminants in the air. Some of these units can connect to local exhaust ventilation systems (e.g. hoods, booths, tents) or have inlet designs that allow close placement to the patient in order to assist with source control; however, these units do not eliminate the need for respiratory protection for individuals entering the room because they may not entrain all of the room air. Information on air flow/air entrainment performance should be evaluated for such devices.
- Healthcare personnel should adhere to standard precautions [http://www.cdc.gov/ncidod/dhqp/gl\\_isolation\\_standard.html](http://www.cdc.gov/ncidod/dhqp/gl_isolation_standard.html), and wear respiratory protection equivalent to a fitted N95 filtering facepiece respirator or higher level of protection during aerosol-generating procedures.
- Unprotected healthcare personnel should not be allowed in a room where an aerosol-generating procedure has been conducted until sufficient time has elapsed to remove potentially infectious particles. (For more information on clearance rates under differing ventilation conditions, please see [http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5417a1.htm?s\\_cid=rr5417a1e#tab1](http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5417a1.htm?s_cid=rr5417a1e#tab1). This table assumes perfect mixing. For example, based on the table, an

AIIR with 6 air changes per hour and perfect room mixing will require 46 minutes to reduce the concentration of airborne particles by 99%. For a more realistic assumption of good mixing, the clearance times provided in this table should be multiplied by a mixing factor of 3. Thus, for an AIIR with 6 air changes per hour and normal room mixing, over two hours will be required to reduce the concentration of airborne particles by 99%). Environmental surface cleaning also is necessary to ensure that environmental contamination does not lead to infection transmission.

#### Duration of Isolation Precautions for Patients

The recommended duration of isolation precautions for hospitalized patients is longer than that recommended for other populations because duration of virus shedding is likely to be longer than for outpatients with milder illness. Isolation precautions for patients who have influenza symptoms should be continued for the 7 days after illness onset or until 24 hours after the resolution of fever and respiratory symptoms, whichever is longer, while a patient is in a healthcare facility. Shedding of influenza viruses generally diminishes over the course of 7 days, with transmission apparently correlating with fever. Given this, if isolation resources (e.g. private rooms) become limited, these resources should be prioritized for patients who are earlier in the course of illness. Clinical judgment may be used for patients with only cough as a symptom, since cough after influenza infection may be prolonged and may not be an indicator of viral shedding. Because some patients with influenza may not have fever but may be shedding influenza virus, patients with any respiratory symptoms should follow hand and respiratory hygiene recommendations, and healthcare personnel working with such patients should continue to follow standard precautions. Patients should be discharged from medical care when clinically appropriate, not based on the period of isolation.

In some cases, facilities may choose to continue isolation precautions for longer periods such as in the case of young children or severely immunocompromised patients, who may shed influenza virus for longer periods of time and who might be shedding antiviral resistant virus. Clinical judgment should be used to determine the need for continued isolation precautions for such patients. Communications regarding the patient's diagnosis with post hospital care providers (e.g. Home-healthcare agencies, long-term care facilities) as well as transporting agencies is essential.

#### Monitor and Manage Ill Healthcare Personnel

Employee health services should establish procedures for tracking absences; reviewing job tasks and identifying personnel at higher risk for complications; assuring that employees have access via telephone to medical consultation and, if necessary, early treatment; and promptly identifying individuals with possible influenza. Healthcare personnel should self-assess for symptoms of febrile respiratory illness. An active approach in which personnel are asked daily about symptoms of febrile respiratory illness is also recommended. In most cases, decisions about work restrictions and assignments for personnel with respiratory illness should be guided by clinical signs and symptoms rather than by laboratory testing for influenza. Personnel should be provided with information about risk factors for complications of influenza, so those at higher risk know to promptly seek medical attention and be evaluated for early treatment if they develop symptoms of influenza. All personnel should be provided with specific instructions to follow in the event of respiratory illness with rapid progression, particularly when experiencing shortness of breath. (See: <http://www.cdc.gov/h1n1flu/sick.htm>.) Anyone with the following emergency warning signs needs urgent medical attention and should seek medical care promptly:

- Difficulty breathing or shortness of breath
- Pain or pressure in the chest or abdomen
- Sudden dizziness
- Confusion

- Severe or persistent vomiting
- Flu-like symptoms improve but then return with fever and worse cough

Healthcare personnel who develop a fever and respiratory symptoms should be:

- Instructed not to report to work, or if at work, to promptly notify their supervisor and infection control personnel/occupational health.
- Excluded from work for at least 24 hours after they no longer have a fever, without the use of fever-reducing medicines.
- If returning to work in areas where severely immunocompromised patients are provided care, considered for temporary reassignment or exclusion from work for 7 days from symptom onset or until the resolution of symptoms, whichever is longer. Clinical judgment should be used for personnel with only cough as a symptom, since cough after influenza infection may be prolonged and may not be an indicator of viral shedding. Healthcare personnel recovering from a respiratory illness may return to work with immunocompromised patients sooner if absence of 2009 H1N1 viral RNA in respiratory secretions is documented by real-time reverse transcriptase-polymerase chain reaction (rRT-PCR). Additional information on diagnostic testing for 2009 H1N1 influenza infection can be found at <http://www.cdc.gov/h1n1flu>
- Reminded of the importance of practicing frequent hand hygiene (especially before and after each patient contact) and respiratory hygiene and cough etiquette after returning to work following an acute respiratory illness.

Healthcare personnel who develop acute respiratory symptoms without fever should be:

- Allowed to continue or return to work unless assigned in areas where severely immunocompromised patients are provided care. In this case they should be considered for temporary reassignment or exclusion from work for 7 days from symptom onset or until the resolution of symptoms, whichever is longer. Clinical judgment should be used for personnel with only cough as a symptom, since cough after influenza infection may be prolonged and may not be an indicator of viral shedding. Healthcare personnel recovering from a respiratory illness may return to work with immunocompromised patients sooner if absence of 2009 H1N1 viral RNA in respiratory secretions is documented by rRT-PCR. Additional information on diagnostic testing for 2009 H1N1 influenza infection can be found at <http://www.cdc.gov/h1n1flu>
- Reminded of the importance of practicing frequent hand hygiene (especially before and after each patient contact) and respiratory hygiene and cough etiquette after returning to work following an acute respiratory illness.

Facilities and organizations providing healthcare services should:

- Ensure that sick leave policies for healthcare personnel (e.g., staff and contract personnel) are flexible and consistent with public health guidance and that employees are aware of the policies. (See [http://www.cdc.gov/h1n1flu/business/guidance/.](http://www.cdc.gov/h1n1flu/business/guidance/))
- Ensure that sick employees are able to stay home without fear of losing their jobs.
- Consider offering alternative work environments as an accommodation for employees at higher risk for complications of 2009 H1N1 influenza during periods of increased influenza activity or if influenza severity increases.
- Not require a doctor's note for workers with influenza to validate their illness or return to work.

#### Antiviral Treatment and Chemoprophylaxis of Healthcare Personnel

Please refer to the CDC web site for the most current recommendations on the use of antiviral agents for treatment and chemoprophylaxis:

<http://www.cdc.gov/h1n1flu/recommendations.htm>. All healthcare personnel concerned about symptoms of influenza should seek advice from their medical provider promptly.

#### Training and education of healthcare personnel

All healthcare personnel should receive training on influenza prevention and risks for complications of influenza. The training should include information on risk assessment; isolation precautions; vaccination protocols; use of engineering and administrative controls and personal protective equipment; protection during high-risk aerosol-generating procedures; signs, symptoms, and complications of influenza; and to promptly seek medical attention for any concerns about symptoms of influenza.

#### Healthcare Personnel at Higher Risk for Complications of Influenza

Personnel at higher risk for complications from influenza infection include pregnant women, persons 65 years old and older, and persons with chronic diseases such as asthma, heart disease, diabetes, diseases that suppress the immune system, and certain other chronic medical conditions. (See

<http://www.cdc.gov/h1n1flu/recommendations.htm> for a more comprehensive list.)

Vaccination and early treatment with antiviral medications are very important for healthcare personnel at higher risk for influenza complications because they can prevent hospitalizations and deaths. Healthcare personnel at higher risk for complications should check with their healthcare provider if they become ill so that they can receive early treatment.

#### Environmental Infection Control

Routine cleaning and disinfection strategies used during influenza seasons can be applied to the environmental management of 2009 H1N1 influenza. Management of laundry, utensils and medical waste should also be performed in accordance with procedures followed for seasonal influenza. More information can be found at: [http://www.cdc.gov/ncidod/dhqp/gl\\_enviroinfection.html](http://www.cdc.gov/ncidod/dhqp/gl_enviroinfection.html).

**Table 1. Examples of Use of a Hierarchy of Controls to Prevent Influenza Transmission**

<b>Elimination of sources of infection</b>	Postponing elective visits and procedures for patients with suspected or confirmed influenza until they are no longer infectious
	Denying healthcare facility entry to those wishing to visit patients if the visitors have suspected or confirmed influenza
	Minimizing outpatient and emergency department visits for patients with mild influenza-like illness who do not have risk factors for complications
	Keeping personnel at home while they are ill to reduce the risk of spreading influenza
	Using local exhaust ventilation (e.g., hoods, tents, or booths) for aerosol-generating procedures
	Using hoods for the performance of laboratory manipulations that generate infectious aerosols
	Using ventilation controls in ambulances
	Installing hands-free soap and water dispensers, and receptacles for garbage and linens to minimize environmental contact
	Conducting aerosol-generating procedures in an airborne infection isolation room (AIIR) to prevent the spread of aerosols to other parts of the facility
	Using closed suctioning systems for airways suction in intubated patients
	Using high efficiency particulate filters on mechanical and bag ventilators
	Ensuring effective general ventilation and thorough environmental surface hygiene
<b>Administrative controls</b>	Vaccinating as much of the healthcare workforce as possible (once vaccine is available)
	Identifying and isolating patients with known or suspected influenza infections
	Implementing respiratory hygiene/cough etiquette programs
	Setting up triage stations, managing patient flow, and assigning dedicated staff to minimize the number of healthcare personnel exposed to those with suspected or confirmed influenza.
	Screening personnel and visitors for signs and symptoms of infection at clinic or hospital entrances or badging stations and responding appropriately if they are present
	Adhering to appropriate isolation precautions
	Limiting the number of persons present in patient rooms and during aerosol-generating procedures
	Arranging seating to allow 6 feet between chairs or between families when possible
	Ensuring compliance with hand hygiene, respiratory hygiene, and cough etiquette
	Making tissues, facemasks, and hand sanitizer available in waiting areas and other locations
	Establishing protocols for cleaning of frequently touched surfaces throughout the facility (elevator buttons, work surfaces, etc.)
	Locating signage in appropriate language and at the appropriate reading level in areas to alert staff and visitors of the need for specific precautions
Placing facemasks on patients, when tolerated, at facility access points (e.g., emergency rooms) or when patients are outside their rooms (e.g. diagnostic testing).	
Placing facemasks on patients during transport; when tolerated; limiting transport to that which is medically necessary; and minimizing delays and waiting times during transport	
<b>Personal protective equipment</b>	Wearing appropriate gloves, gowns, facemasks, respirators, eye protection, and other PPE

**Table 2. Prioritization of Respiratory Protection During Respirator Shortages for Healthcare Personnel Not Participating in Aerosol-Generating Procedures<sup>a</sup> (Numbers 1 through 4 indicate relative priorities for respiratory protection, with 1 the highest priority and 4 the lowest priority)**

<b>Exposure Scenario</b>	<b>Not Vaccinated<sup>b</sup></b>	<b>Vaccinated<sup>c</sup></b>
<i>Personnel Without Risk Factors for Influenza-Related Complications<sup>d</sup></i>	-	-
Routine care – frequent close exposure <sup>e</sup>	2	4
Routine care – infrequent close exposure <sup>f</sup>	3	4
<i>Personnel With Risk Factors for Influenza-Related Complications<sup>g</sup></i>		
Routine care – frequent close exposure	1	3
Routine care – infrequent close exposure	2	4

**a** – This table is provided as an example of prioritization that considers intensity and duration of exposure, personal health risk factors for complications of infection, and vaccination status. Advance planning is critical to efficient implementation of prioritized use during supply shortages.

**b** – Not vaccinated: not vaccinated or less than 14 days after vaccination. Consider including those with immunosuppressive conditions or treatment with immunosuppressive therapies anticipated to impair vaccine response in this group.


**c** – Vaccinated: 14 or more days after vaccination.

**d** - See section on “Healthcare Personnel at Higher Risk for Complications of Influenza” for list of personal risk factors for influenza-related complications; also see: <http://www.cdc.gov/h1n1flu/recommendations.htm>.

**e** – Personnel frequently in close contact with patients with suspected or confirmed 2009 H1N1 influenza. For the purposes of this document, close contact is defined as working within 6 feet of the patient or entering into a small enclosed airspace shared with the patient (e.g., average patient room). This generally includes personnel working in settings where cases of suspected or confirmed 2009 H1N1 influenza are routinely seen (e.g. emergency departments and primary care in environments such as clinics in outpatient settings, employee healthcare facilities, and correctional facilities).

**f** – Personnel infrequently in close contact with patients with suspected or confirmed 2009 H1N1 influenza. This generally includes personnel working in settings where cases of suspected or confirmed 2009 H1N1 influenza are not routinely seen and/or having job duties not involving close contact.

**g**– Gathering of personal information for the purposes of pandemic planning and response must be done in a fashion that is compliant with all applicable rules and regulations, including the Americans with Disabilities Act (ADA). A short technical assistance document is available at the following web address:

[http://www.eeoc.gov/facts/h1n1\\_flu.html](http://www.eeoc.gov/facts/h1n1_flu.html).  Consider offering alternative work environments as an accommodation for employees at highest risk for complications of influenza during periods of increased influenza activity or if influenza severity increases.

## **Appendix: Additional Information for Specific Healthcare Settings**

Additional information is available online to assist in customizing guidance to specific healthcare settings. CDC, together with other agencies, is actively producing new and updated documents. Many of these can readily be accessed via the following web pages:

- H1N1 Flu Clinical and Public Health Guidance (CDC):  
<http://www.cdc.gov/h1n1flu/guidance/>
- Infection Control in Health Care Facilities (CDC):  
<http://www.cdc.gov/flu/professionals/infectioncontrol/index.htm>
- Health Care Planning (U.S. Department of Health and Human Services):  
<http://www.pandemicflu.gov/plan/healthcare/index.html>

Information can also be obtained via the CDC-INFO National Contact Center, where representatives are available at all times to answer questions in English and Spanish:  
Call: 1-800-CDC-INFO (1-800-232-4636)  
TTY: (888) 232-6348,  
Email: [cdcinfo@cdc.gov](mailto:cdcinfo@cdc.gov)

### **Hospitals**

Hospital Pandemic Influenza Planning Checklist:

<http://www.pandemicflu.gov/plan/healthcare/hospitalchecklist.html>

[Pandemic Influenza Preparedness and Response Guidance for Healthcare Workers and Healthcare Employers](#). OSHA Publication 3328-05, (2007). Also available as a 405 KB PDF, 104 pages. <https://www.osha.gov/Publications/3328-05-2007-English.html>

Frequently Asked Questions on Pandemic Influenza Preparedness and Response Guidance for Healthcare Workers and Healthcare Employers

[https://www.osha.gov/SLTC/pandemicinfluenza/pandemic\\_health.html](https://www.osha.gov/SLTC/pandemicinfluenza/pandemic_health.html)

### **Emergency Medical Services**

Emergency Medical Services and Non-Emergent (Medical) Transport Organizations Pandemic Influenza Planning Checklist:

<http://www.pandemicflu.gov/plan/healthcare/emgncymedical.html>

Interim Guidance for Emergency Medical Services (EMS) Systems and 9-1-1 Public Safety Answering Points (PSAPs) for Management of Patients with Confirmed or Suspected Swine-Origin Influenza A (H1N1) Infection:

[http://www.cdc.gov/h1n1flu/guidance\\_ems.htm](http://www.cdc.gov/h1n1flu/guidance_ems.htm)

Interim Guidance for Cleaning Emergency Medical Service (EMS) Transport Vehicles during an Influenza Pandemic:

[http://www.pandemicflu.gov/plan/healthcare/cleaning\\_ems.html](http://www.pandemicflu.gov/plan/healthcare/cleaning_ems.html)

Managing Calls and Call Centers during a Large-Scale Influenza Outbreak:

Implementation Tool: <http://www.cdc.gov/h1n1flu/callcenters.htm>

### **Medical Offices and Clinics**

Medical Offices and Clinics Pandemic Influenza Planning Checklist:

<http://www.pandemicflu.gov/plan/healthcare/medical.html>

10 Steps You Can Take: Actions for Novel H1N1 Influenza Planning and Response for Medical Offices and Outpatient Facilities: <http://www.cdc.gov/h1n1flu/10steps.htm>

### **Obstetric Settings**

Considerations Regarding Novel H1N1 Flu Virus in Obstetric Settings:

<http://www.cdc.gov/h1n1flu/guidance/obstetric.htm>


### **Outpatient Hemodialysis Settings**

Interim Additional Guidance for Infection Control for Care of Patients with Confirmed, Probable, or Suspected Novel Influenza A (H1N1) Virus Infection in Outpatient Hemodialysis Settings:

[http://www.cdc.gov/h1n1flu/guidance/hemodialysis\\_centers.htm](http://www.cdc.gov/h1n1flu/guidance/hemodialysis_centers.htm)

### **Long-Term Care and Other Residential Services**



Long-Term Care and Other Residential Facilities Pandemic Influenza Planning

Checklist: <http://www.pandemicflu.gov/plan/healthcare/longtermcarechecklist.html> 



### **Home Health Care**



Home Health Care Services Checklist:

<http://www.pandemicflu.gov/plan/healthcare/healthcare.html>  

Home Care Guidance: Physician Directions to Patient/Parent:

[http://www.cdc.gov/h1n1flu/guidance\\_homecare\\_directions.htm](http://www.cdc.gov/h1n1flu/guidance_homecare_directions.htm)

Home Health Care During an Influenza Pandemic: Issues and Resources:

<http://www.pandemicflu.gov/plan/healthcare/homehealth.html>  

### **Pathology / Clinical Laboratory**

Post-mortem Care and Safe Autopsy Procedures for Novel H1N1 Influenza:



[http://www.cdc.gov/h1n1flu/post\\_mortem.htm](http://www.cdc.gov/h1n1flu/post_mortem.htm)

Interim Biosafety Guidance for All Individuals handling Clinical Specimens or Isolates containing 2009-H1N1 Influenza A Virus (Novel H1N1), including Vaccine Strains:

[http://www.cdc.gov/h1n1flu/guidelines\\_labworkers.htm](http://www.cdc.gov/h1n1flu/guidelines_labworkers.htm)

### **Educational Institutions**

School Planning web page (provides links to numerous resources):







<http://pandemicflu.gov/plan/school/index.html>  

### **Correctional Institutions**

Correctional Facilities Pandemic Influenza Planning Checklist:

<http://www.pandemicflu.gov/plan/workplaceplanning/correctionchecklist.html>  

Interim Guidance for Correctional and Detention Facilities on Novel Influenza A (H1N1) Virus: [http://www.cdc.gov/h1n1flu/guidance/correctional\\_facilities.htm](http://www.cdc.gov/h1n1flu/guidance/correctional_facilities.htm)

Respirator use should be in the context of a complete respiratory protection program in accordance with Occupational Safety and Health Administration (OSHA) regulation 29 CFR 1910.134, Respiratory Protection: [https://www.osha.gov/pls/oshaweb/owadisp.show\\_document?p\\_table=STANDARDS&p\\_id=12716](https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=12716)  . Information on respiratory protection programs and fit test procedures can be accessed at <http://www.osha.gov/SLTC/etools/respiratory>  . Staff should be medically cleared, fit-tested, and trained for respirator use, including: proper fit-testing and use of respirators, safe removal and disposal, and medical contraindications to respirator use. Additional information on N95 respirators and other types of respirators certified by NIOSH may be found at: <http://www.cdc.gov/niosh/npptl/topics/respirators/factsheets/respfact.html> and at <http://www.fda.gov/cdrh/ppe/masksrespirators.html>  . A complete

listing of NIOSH-approved disposable particulate respirators (filtering facepieces) by manufacturers/suppliers and model numbers may be found at [http://www.cdc.gov/niosh/npptl/topics/respirators/disp\\_part/](http://www.cdc.gov/niosh/npptl/topics/respirators/disp_part/).