Infection Control Guidelines in Healthcare Settings

The intention of this document is to assist healthcare settings in the planning for pandemic influenza by enhancing standard infection control practices.

The primary strategies for preventing pandemic influenza are the same as those for seasonal influenza: vaccination, early detection and treatment with antiviral medication, and the use of infection control measures to prevent transmission during patient care. However, when a pandemic begins, a vaccine may not yet be widely available, and the supply of antiviral drugs may be limited. In addition, antiviral drugs do not eliminate viral shedding or obviate the need for personal protective equipment. The ability to limit transmission in the healthcare settings will, therefore, rely heavily on the appropriate application of infection control measures.

Infection control guidance is based on knowledge of routes of influenza transmission, the pathogenesis of influenza, and the effects of influenza control measures used during past pandemics and inter-pandemic periods. However, the characteristics of a pandemic strain may be different. Planning must allow for flexibility and real-time decision-making that takes new information into account as the pandemic unfolds.

1. Background

Despite the prevalence of influenza every year, the amount of empirical data on influenza transmission is limited. Epidemiologic patterns suggest spread through large infectious respiratory droplets that are deposited on the oral, nasal or conjunctival mucosa of a susceptible host. Transmission via large droplets requires close contact between the infectious host and the susceptible individual. Special air handling and ventilation are not required to prevent transmission of disease transmitted primarily by droplets, as large particle droplets do not remain suspended in the air and generally travel only short distances (about three feet) through the air.

The significance of direct contact, indirect contact and airborne transmission has not been well established. In addition, certain host factors (i.e., diarrhea) or procedures (i.e., bronchoscopy) might alter the usual modes of transmission. The most appropriate form of respiratory protection during a pandemic remains controversial. The most recent recommendations can be found at http://www.pandemicflu.gov/plan/healthcare/maskguidancehc.html.

The incubation period for routine seasonal influenza is 1 – 4 days, with an average of 2 days. The incubation period of a novel influenza strain would be unknown until the time it is circulating in the population. Therefore, the maximum interval between exposure and symptom onset for pandemic influenza will be considered 10 days for the purposes of this document. Influenza is contagious for approximately 24 – 48 hours prior to symptom onset and throughout most of the symptomatic period. Certain individuals, such as those with immunocompromising conditions and children, may shed the virus for longer periods.

Individuals involved in pandemic influenza planning for healthcare entities, might want to familiarize themselves with the explanation of standard, droplet, airborne and contact precautions outlined by the Center for Disease Control and Prevention (CDC) found at http://www.cdc.gov/ncidod/dhqp/gl_isolation.html.

Avian Influenza A (H5N1) is highly contagious among birds and does not usually infect people. Although a few avian influenza viruses have crossed the species barrier to infect humans, it is still considered to be a very rare disease in people. The H5N1 virus does not infect humans easily, and if a person is infected, it is very difficult for the virus to spread to another person. Of the human cases associated with the ongoing H5N1 outbreaks in Asia, parts of Europe, the Near East and Africa, the infections have occurred mostly from people having direct or close contact with H5N1-infected poultry or H5N1-contaminated surfaces.

Because all influenza viruses have the ability to change, scientists are concerned that the H5N1 virus might one day be able to infect humans and spread easily from one person to another. If the H5N1 virus gains the capacity to spread easily from person to person, there will be little or no immune protection in the human population and an influenza pandemic could begin. At this point in time, infection control guidelines for those confirmed or suspected to be infected with the H5N1 strain differ in some respects from the guidance in this document. For more information about the avian influenza, go to the CDC website: http://www.cdc.gov/flu/avian/gen-info/facts.htm or the NJDHSS website at http://www.state.nj.us/health/flu/avianflu.shtml.

2. Infection Control in Healthcare Settings

The recommendations for infection control are applicable throughout the different pandemic phases and represent sound infection control practices that are applicable for the control of communicable diseases. The key to successfully controlling transmission of influenza, and other communicable respiratory infections, is the early identification of potentially infectious individuals, and the immediate implementation of control measures for containment.

A. Basic infection control principles for preventing the spread of pandemic influenza for all pandemic periods

- Limit contact between potentially infected and non-infected individuals.
  - Ensure early identification of potentially infected individuals.
  - Physically isolate infected persons if possible/appropriate for setting.
  - Promote spatial separation in common areas (i.e., maintain at least three feet from potentially infectious persons).
- Protect healthcare workers from exposure while delivering care
  - Wear a surgical or procedure mask for close contact with infectious patients (i.e., within three feet).

  - Use standard precautions including the use of personal protective equipment to prevent contact with respiratory secretions.
  - Perform hand hygiene after contact with infectious patients or their immediate environment. Reinforce compliance with hand hygiene by:
    - Providing education on the importance of hand hygiene for the prevention of transmission of infectious agents;
    - Providing easy access to hand-washing facilities or alcohol-based hand sanitizers;
    - Placing signage about hand washing procedures throughout the facility. http://www.cdc.gov/handhygiene/
  - Educate healthcare workers to avoid touching eyes, nose or mouth with contaminated hands (gloved or ungloved) while delivering care and until they perform hand hygiene.
  - Enforce a ban on consuming food or beverages by healthcare workers in patient care areas.
  - Consider the use of particulate respirators if performing or assisting with aerosol-generating procedures.
- Contain infectious respiratory secretions.
  - Implement the use of respiratory hygiene/etiquette.
  - Place signage regarding respiratory etiquette and universal respiratory precautions throughout the facility.
  - Promote the use of masks by symptomatic individuals in common areas or when being transported.
- Assure environmental controls.
  - Redouble efforts to clean potentially contaminated environmental surfaces by:
    - Daily cleaning of horizontal, frequently touched and lavatory surfaces.
    - Discharge cleaning of above surfaces and soiled vertical surfaces.
    - Assuring the products used for daily routine and discharge cleaning is an Environmental Protection Agency (EPA) registered low or intermediate-level disinfectant and is used per manufacturers' instructions.
    - Follow CDC Guideline for Environmental Control in Health-Care Facilities found at http://www.cdc.gov/ncidod/dhqp/gl_environinfection.html
  - Minimize the use of items shared by patients such as clipboards, pens and telephones.
  - Place tissues throughout patient care areas for use by symptomatic patients.
  - Place no-touch receptacles in patient care areas to facilitate disposal of used tissues.
  - Place alcohol-based hand sanitizers in patient care areas if hand-washing facilities are not available.

- Develop policies and procedures to speed the processing of symptomatic individuals such as the use of standing orders for assessment or admission.
- Use standard precautions, including gloves, when handling waste. Dispose of solid waste (medical and non-medical) that might be contaminated with influenza virus in accordance with facility-specific procedures and/or local or state regulations for handling and disposal of medical waste, including needles and other sharps, and non-medical waste.
- Use standard precautions, including gloves, when handling and transporting laundry potentially contaminated with respiratory secretions. Place soiled laundry directly into a laundry bag in the patient's room for transport to linen holding areas. Wash and dry laundry according to routine standards and procedures. Use standard precautions, including gloves, when handling dishes and eating utensils used by a patient with influenza. Disposable dishes and utensils should be discarded with other non-medical waste. Reusable dishes and utensils should be washed in a dishwasher with recommended water temperature.
- Use standard precautions, including gloves, when caring for the deceased. Follow facility-specific practices for care.

B. Management of Infectious/Potentially Infectious Individuals

- Respiratory Etiquette or Universal Respiratory Precautions should be utilized at all times in all healthcare settings and points of entry into the healthcare delivery system (e.g., emergency departments, admissions departments, outpatient clinics, physician offices). Please see http://www.cdc.gov/flu/professionals/infectioncontrol/resphygiene.htm and http://nj.gov/health/flu/education.shtml for the elements of Respiratory Etiquette or Universal Respiratory Precautions.
  - Institute policies and procedures to identify symptomatic patients at point of first contact including triage areas, reception areas or during the scheduling of appointments. This necessitates the education of healthcare workers not traditionally trained in patient assessment such as security or registration staff.
- Droplet precautions and patient placement
  Patients with known or suspected influenza should be placed on droplet and standard precautions for the duration of illness, and a minimum of five days from the onset of symptoms. The duration of infectivity might vary depending on the characteristics of the pandemic virus or on the characteristics of the influenza infected patient. For instance, immunocompromised individuals and children could potentially shed virus for several weeks. Information on droplet precautions can be found at

http://www.cdc.gov/ncidod/dhqp/gl_isolation_droplet.html. Precautions include:

- Donning a surgical or procedural mask when within 3 feet of a symptomatic individual. If a healthcare worker is attending multiple patients in the same room(e.g., in a cohort situation), the same mask may be utilized until the healthcare worker leaves the room. If desired, a healthcare worker may choose to don a particulate respirator for patient care activities. Guidance on the choice of respiratory protection devices can be found at http://www.pandemicflu.gov/plan/healthcare/maskguidancehc.html
- Performing hand hygiene after each patient encounter.
- Placing patients in a private room, if possible. Patients may be cohorted, if necessary.

- Contact Precautions
  There is insufficient data to determine the role of direct or indirect contact in the transmission of influenza. If the patient has diarrhea, contact precautions should be added.
- Aerosol-generating procedures for patients with suspected influenza
  Aerosol-generating procedures (e.g., endotracheal intubation, suctioning, nebulizer treatments, and bronchoscopy) may increase the potential for dissemination of droplet nuclei in the immediate vicinity of the patient. Therefore, healthcare workers should us a NIOSH-approved N-95 or other particulate respirator when performing or assisting with aerosol-generating procedures. Particulate respirators should be used within the context of a respiratory protection program that includes fit-testing, medical clearance, and training. The number of healthcare workers present during aerosol-generating procedures should be limited to reduce the number of workers potentially exposed. If available, aerosol-generating procedures should be performed in Airborne Infection Isolation Rooms.
- Postmortem care
  Follow standard facility practices for care of deceased. Practices should include standard precautions for contact with blood and body fluids.

C. Occupational health issues for all pandemic periods

- Surveillance activities are applicable throughout the pandemic periods. Once a pandemic has reached a community, healthcare facilities must increase active surveillance and monitoring of healthcare personnel (including non-direct patient care staff). Healthcare worker shortages due to the pandemic may also necessitate utilizing ill healthcare workers who are well enough to care for patients.
  - Designate those responsible for the monitoring of employee health concerns such as the employee/occupational health service.

  - Instruct all healthcare personnel to report influenza-like illness immediately.
  - If the onset of illness occurs while working, the healthcare worker should don a surgical mask and seek evaluation. If the onset occurs while at home, the employee should be instructed to remain at home until symptoms resolve.
  - Investigate clusters of illness within the facility and report to your local public health agency.
  - Develop policies and procedures for healthcare workers returning to work after an influenza-like illness.
  - Personnel at high risk for complications of influenza (e.g., pregnant women, immunocompromised individuals) should be informed of their medical risk and offered an alternate assignment away from influenza-patient care.
  - Closely monitor healthcare personnel with direct contact with influenza patients for early identification of secondary transmission. The following should be considered:
    - Limit patient contact to essential staff.
    - Eliminate or minimize floating.
    - Consider a daily sign in sheet for patient contact to facilitate epidemiological investigations.
    - Have staff complete a daily self-assessment to document symptoms.
  - Have policies and procedures in place to administer vaccine and antivirals to staff when available.
- Occupational health issues for a local influenza pandemic
  - All personnel (direct patient care and non-direct patient care) should be actively monitored daily for fever and respiratory symptoms. All those with respiratory symptoms and/or fever $\geq$ 100 F should be furloughed and evaluated.
  - Personnel who have recovered from pandemic influenza should develop antibodies against future infection with the same virus. Therefore, these personnel should be prioritized for the care of patients with active pandemic influenza infection. Regardless of immune status to the pandemic influenza virus, the healthcare worker should use appropriate personal protective equipment.
  - If a severe staffing shortage occurs as a result of the pandemic, it might be necessary for infected healthcare workers, if they are physically capable, to care for patients. These workers should be given antiviral treatment, if available, instructed to wear a surgical mask, and assigned to the ill cohort.

3. Hospital-Specific Infection Control Guidance

A. Early detection and source control to prevent transmission of pandemic influenza during all pandemic periods

- Place signage in appropriate languages at all entrance and strategic locations throughout the facility detailing:
    - The signs and symptoms of influenza and any current epidemiological risk factors for a pandemic strain, if identified.
    - Visitors with influenza-like illness should not visit the facility.
    - Persons entering the hospital seeking care for respiratory symptoms should immediately inform the receptionist/triage personnel of their symptoms and use respiratory etiquette/universal respiratory precautions.
- Early detection of patients with respiratory symptoms can take place at triage areas, reception areas or during the scheduling of appointments.
    - Identify and train those personnel who are first points of contact to screen patients for respiratory symptoms.
    - Discourage unnecessary visits to medical facilities.
    - Instruct symptomatic patients on infection control measures to limit transmission in the home and when traveling to necessary medical appointments.
- Screen all patients presenting with respiratory illness for epidemiological links to areas affected by the pandemic:
    - Travel to affected area within 10 days of illness onset.
    - Recent contact with an ill person known to have had recent travel to an affected area.
    - Prioritize those meeting the above criteria to be placed in a private exam room on droplet precautions.
    - Notify the appropriate authorities of any person meeting the above criteria.
- Respiratory hygiene/Universal Respiratory Precautions should be utilized at all points of entry into the healthcare delivery system including the Emergency Departments, Admissions Departments, Outpatient Clinics, and Physicians Offices.
- If the pandemic strain has not yet been identified locally, have systems in place to screen patients for epidemiological links to areas affected by the pandemic;
    - Travel to an affected area within 10 days of onset of illness;
    - Recent contact with an ill person known to have had recent travel to an affected area.
    - Prioritize those meeting the epidemiological criteria to be placed in a private exam room on droplet precautions.
- Communicate to triage and front-line personnel on a regular basis the status of the pandemic. The frequency of updates will depend on the epidemiology of the pandemic.
- Once the pandemic strain has been identified locally, mask all family members and visitors accompanying patients with influenza-like illness since they may be incubating the disease. More specific information on how to manage a surge in patients with influenza-like illness can be found in the document Influenza Surge Capacity Guidance for General Hospitals at http://nj.gov/health/flu/pand_healthcareprof.shtml.

B. Early detection and source control during a local pandemic

- Screen all patients and visitors for respiratory illness at points of entry into the healthcare system.
- Screening for epidemiological links is not indicated once the pandemic is underway locally.
- Mask all family members and visitors accompanying patients with influenza-like illness, as they may be incubating the disease.
- Follow guidance as outlined in Influenza Surge Capacity Guidance for General Hospitals as numbers of individuals seeking medical attention increases locally.

4. Long-term Care-specific Infection Control Guidance

Residents of long-term care facilities are a particularly vulnerable population for the acquisition and development of complications of influenza due to advanced age, co-morbid conditions, close contact with other vulnerable individuals, and decreased response to influenza vaccine. A pandemic influenza planning checklist for long-term care and other residential facilities can be found at http://pandemicflu.gov/plan/healthcare/longtermcarechecklist.html.

During a pandemic, long-term care facilities should anticipate the need to manage the acute influenza and non-influenza related medical needs of residents, as hospitals may be unable to meet the demand for care. In addition, transfer of patients will only increase the likelihood of transmission between healthcare settings. Basic principles for infection control measures related to seasonal influenza transmission in long-term care facilities can be found at http://www.cdc.gov/flu/professionals/infectioncontrol/longtermcare.htm. The principles outlined in this document can be applied during a pandemic influenza.

- **Prevention or delay of pandemic influenza virus entry into the facility during all influenza pandemic periods**
  - Place signage in appropriate languages at all entrance and strategic locations throughout the facility detailing:
    - The signs and symptoms of influenza and any current epidemiological risk factors for a pandemic strain, if identified.
    - Visitors with influenza-like illness should not visit the facility. Once a pandemic is identified but has not yet affected the local area, consider restriction of those visitors who have had recent travel (within 10 days) to areas affected by the illness, as they may be incubating the illness. Visitation policies should be developed and enforced.
  - Designate an individual(s) to obtain current information from the DHSS web site and LINCS/CHAIN on the status and epidemiology of the pandemic. Ensure that this information is

communicated to all clinical staff and direct patient-care providers.
    - Implement respiratory etiquette/Universal Respiratory Protection at all points of entry into the facility and in common areas.
    - Perform careful screening of all new admissions to the facility. Admit any new patients with symptoms or contacts of symptomatic individuals to private rooms with standard and droplet precautions.
    - Follow occupational health guidelines as outlined above in section 2C.
- **Early detection, prevention or delay of pandemic influenza in facility during a local pandemic**
  In addition to the measures delineated above, implement the following recommendations:
    - Assign personnel to verbally and visually screen visitors for respiratory illness and actively enforce visitor restrictions.
    - Limit visitors to persons who are needed to perform resident care, should a staffing shortage necessitate.
    - Early in the progress of a pandemic in the region, increase resident surveillance for influenza-like symptoms. Notify state or local health officials if a case(s) is suspected.
    - Carefully screen new admissions for symptoms of, and exposure to, pandemic influenza. Perform resident placement of new admissions with the following considerations:
        - Residents with respiratory symptoms who require admission to the facility should be admitted preferably to a private room on droplet precautions for the duration of illness, and for a minimum of 5 days beyond symptom onset. If a private room is not available, cohort patients.
        - Residents with exposure to pandemic influenza that require admission to the facility should be admitted to a private room on droplet precautions for the duration of the pandemic strain incubation period. If a private room is not available, cohort patients.
        - Asymptomatic residents and those with no known exposure should be admitted to the general resident population with caution. Perform careful screening for respiratory symptoms for the entire incubation period. Establish cohorts and place all new admissions on droplet precautions for the entire incubation period if widespread pandemic influenza is identified in the local community.
    - If symptoms of influenza are apparent, implement droplet precautions for the resident and roommates, pending confirmation of pandemic influenza virus infection. Patients and roommates should not be separated or moved out of their rooms unless medically necessary. Once the diagnosis has

been confirmed, roommates should be treated as exposed cohorts.
- Cohort residents and staff on units with known or suspected cases of pandemic influenza. Plans should be developed in advance on the best location and manner in which patients will be cohorted within the facility.
- Limit movement within the facility (e.g., close the dining room and serve meals on nursing unit, cancel social and recreational activities).
- Consider use of vaccine or antiviral agents, if available, for high risk contacts.
- Consider suspending all group activities during the local pandemic.
- Administer traditional group therapies individually to residents or within the cohorts.
- Curtail floating of direct care staff as feasible.

Consider developing guidelines for cohorting, visitors and nosocomial outbreak management.

5. Home Healthcare-Specific Infection Control Guidance

Home Healthcare personnel face considerable challenges when attempting to implement standard infection control practices in the home setting. Unlike hospitals and long-term care facilities, space is often limited and cleaning of the environment is not under the control of the healthcare provider. The home healthcare worker is subject to uncontrolled and unpredictable events and circumstances. In addition, the need for home healthcare services may increase during a pandemic and the acuity of patients being cared for at home may increase as acute care facilities are unable to meet the demand for care. A pandemic influenza planning checklist for home health care services can be found at http://www.pandemicflu.gov/plan/healthcare.html.

- Home health agencies should ensure that there is a qualified individual(s) specifically assigned responsibility for infection control and occupational health.
- Assess infection control and occupational health policies to assure that they are consistent with current guidelines.
- Develop strategies to assess possible transmission risk to the healthcare worker in the home based on referral information:
  - Assure referrals from discharge planners or primary care physicians address the presence of communicable diseases.
  - Develop a communication plan to notify staff going into the home if precautions beyond standard precautions are indicated.
- Assure personal protective equipment is available for staff and that staff receive appropriate training.

- Assure hand hygiene materials are accessible. Alcohol-based rubs, soap and paper towels should be in easy access for the healthcare worker at the point of care.
- Ask symptomatic individuals in the home to don a surgical mask while the healthcare worker is present to decrease the risk of aerosolization of respiratory secretions.
- The agency should have staff trained and fit-tested to use particulate respirators in the event the patient meets criteria for the institution of airborne precautions.
- Designate an individual(s) to obtain current information on the status and epidemiology of the pandemic. Ensure that this information is communicated to all clinical staff and direct patient-care providers. Information can be found at www.state.nj.us/health or will be distributed via LINCS/CHAIN.
- Develop a plan to expeditiously administer vaccine and antiviral medication to staff, in the event they are available and recommended.
- Review policies regarding home laboratory testing, referral for evaluation and/or treatment, and accessing transportation of symptomatic individuals.
- Review Occupation Health Issues found in 2C.

6. Emergency Medical Services-Specific Infection Control Guidance

Patients with severe influenza or comorbid conditions are likely to require emergency transport to the hospital. EMS workers should:

- Screen patients requiring emergency transport for symptoms of influenza.
- Follow standard and droplet precautions when transporting symptomatic patients.
- If possible, ask family members of symptomatic patients accompanying the patient to don a surgical mask to prevent aerosolization of respiratory secretions.
- EMS should have staff trained and fit-tested to use particulate respirators in the event the patient meets criteria for the institution of airborne precautions.
- Optimize the vehicles ventilation to increase the volume of air exchange during transport. When possible, use vehicles that have separate driver and patient compartments that can provide separate ventilation to each.
- Notify the receiving facility that a patient with influenza-like-illness is being transported.
- Follow standard operating procedures for routine cleaning of the vehicle and reusable patient care equipment.
- Oxygen delivery with a non-rebreather face mask can be used to provide oxygen during transport. If needed, positive-pressure ventilation should be performed using a resuscitation bag-valve mask.

- Unless medically necessary, aerosol-generating procedures, such as intubation, should be avoided during pre-hospital care.
- Develop a plan to expeditiously offer and administer vaccine and antiviral medication to staff, in the event they are available and recommended.

7. Outpatient Medical Office-Specific Infection Control Guidance

Individuals with influenza-like illness seek care primarily in the outpatient setting. During a pandemic, outpatient medical service providers including private practitioners are expected to maintain office operations. In order to decrease the burden of patients presenting to hospitals, providers are expected to minimize referrals to hospitals emergency rooms for evaluation. Only those patients who need hospital-based services should be referred for admission. Providers must take steps to ensure a safer environment for patients and staff. These include:

- Institute Triage Polices
    - Ask patients with influenza-like illnesses to identify themselves upon arrival or when calling for an appointment.
    - Ensure that patients with influenza-like illnesses are evaluated expeditiously.
    - Consider scheduling patients with influenza-like illnesses at the end of the day or at a time separate from well visits.
    - Considering having patients with influenza-like illnesses arrive through a separate entrance or wait in a different area from others.
    - Ensure that a staff member calls ahead if referring a patient with an influenza-like illness to another medical provider or facility.
    - Encourage staff with influenza-like illnesses to remain at home.
- Follow Respiratory Etiquette/Universal Respiratory Precautions
    - Place signs in waiting area describing Universal Respiratory Precautions or Respiratory Etiquette.
    - Provide tissues in the waiting area to contain respiratory secretions when coughing or sneezing.
    - Provide no-touch receptacles for disposal of used tissues.
    - Provide alcohol-based hand sanitizers in waiting areas and encourage hand hygiene after contact with respiratory secretions.
    - Provide symptomatic individuals with surgical masks to wear while interacting with others in the office.
    - Encourage office staff to wear surgical masks when in close contact (i.e., within three feet) with symptomatic individuals and to practice good hand hygiene when interacting with these individuals.
- Reinforce Standard and Droplet Precautions
    - Ensure staff members are familiar with standard and droplet precautions.

  - Wash hands with soap and water or use alcohol-based hand sanitizers before direct patient contact, after contact with respiratory secretions, after removal of gloves, or after contact with contaminated environmental surfaces.
  - Wash hands before eating or drinking. Discourage eating or drinking in patient-care or reception areas.
  - Eliminate or decrease the use of items shared by patients such as pens, clipboards and telephones. Re-double efforts to decontaminate environmental surfaces in waiting and patient-care areas. Ensure that medical devices such as otoscopes, thermometers, and stethoscopes are appropriately cleaned between patients.
- Ensure System to Provide Vaccine or Antivirals
  - Develop a plan to provide vaccine and antivirals to staff, if available and recommended.
- Understand Surveillance and Reporting Policies
  - Designate an individual(s) to obtain current information on the status and epidemiology of the pandemic. Ensure that this information is communicated to all clinical staff and direct patient-care providers. Information can be located at www.state.nj.us/health or will be distributed via LINCS/CHAIN.