

# **Pandemic Influenza Primer for Healthcare Workers**

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**Overview:** This publication is a compendium of information and resources intended to help inform healthcare workers. The aim is to provide education and practical guidance in the assessment, triage, testing and treatment of patients suspected of having infection with influenza virus as well as provide guidance and resources for pandemic planning efforts. This original detailed version serves as the basic compendium, with the goal of regularly updating each section as new information, guidelines and recommendations become available. The most up-to-date version of this primer may be viewed by visiting one of two sites. For those within or outside the University of Kentucky system, the primer may be found by visiting the following link and clicking on the “For Medical Professionals” tab: <http://www.uky.edu/EM/swineflu.htm>  
For those within the UK system, the primer may be viewed by visiting the home page for Infection Prevention and Control at: <http://www.hosp.uky.edu/ipc/index.html>

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Much of the information and many of the internet links in this primer were sourced from the Centers for Disease Control and Prevention (CDC) website. The CDC website is rich with information and the site is generally easy to navigate. However, it can be very difficult to find answers to specific questions by visiting the site because it is voluminous and because the site’s search engine is anything but robust. This compendium serves as an attempt to organize the most commonly asked questions regarding pandemic influenza into a more practical format, with links to specific CDC website content areas and other sources for those who wish to read more on a particular subject.

## **Influenza Virus Basics**

### **Seasonal Influenza Viruses**

#### **Influenza A**

- Usually 2-3 circulating subtypes each season, and these are included in annual vaccines (present seasonal vaccine includes one Influenza A H3N2, one Influenza A H1N1 and one Influenza B subtype)
- Subtypes are named for specific glycoproteins expressed on their surfaces; Hemagglutinin (H) and Neuraminidase (N)
- Present worldwide circulating subtypes: H3N2, H1N1
- Responsible for major pandemics
- Infect humans and animals, which is a key factor in the evolution of pandemics through reassortment and antigenic shift

#### **Influenza B**

- Can cause morbidity and mortality, but are generally associated with less severe epidemics than are influenza A viruses; found only in humans

#### **Influenza C**

- Cause only mild illness in humans and are not responsible for epidemics or pandemics; found only in humans

**High Risk Influenza Populations for Seasonal Influenza:** Note that in the following categorizations for individuals at increased risk for serious disease from both Seasonal and Novel H1N1 Influenza that there is considerable (about 75%) overlap between the two groups. This has obvious implications for testing and treatment that will be discussed later in this primer. (see below under **“Assessment, Triage, Laboratory Testing, and Treatment of Patients with Influenza-Like Illness (ILI)”**)

#### **Persons at Greatest Risk for Serious or Life-Threatening Disease from Seasonal Influenza:**

- **Children younger than 5 years old.** The risk for severe complications from seasonal influenza is highest among children younger than 2 years old.
- **Adults 65 years of age and older**
- **Persons with the following conditions:**
  - Chronic pulmonary (including asthma), cardiovascular (except hypertension), renal, hepatic, hematological (including sickle cell disease), neurologic, neuromuscular, or metabolic disorders (including diabetes mellitus);
  - Immunosuppression, including that caused by medications or by HIV;

- Pregnant women;
- Persons younger than 19 years of age who are receiving long-term aspirin therapy;
- Residents of nursing homes and other chronic-care facilities.

## **2009 Pandemic Influenza Virus**

### Novel H1N1 (swine origin) Influenza A Virus

- Genetically distinct from present Seasonal Influenza A H1N1 virus
- Direct descendant of H1N1 Influenza virus that caused major human pandemics from 1918 through 1953
- Had not circulated in the human population since 1957 (52 years) but re-emerged from Mexican swine in March of 2009 to cause human pandemic
- Contains human, avian and swine influenza RNA gene segments

### **Persons at Greatest Risk for Serious or Life-Threatening Disease from Novel H1N1 Influenza:**

- **Pregnant women:** because of higher risk of H1N1 complications. Vaccine can also potentially provide immunity and protection to infants less than six months of age who cannot be vaccinated
- **Household contacts and caregivers for children younger than 6 months of age:** because younger infants are at higher risk of complications from the H1N1 virus but cannot be vaccinated. Vaccination of those in close contact with infants <6 months should help protect them by “cocooning” them from the virus
- **Healthcare and emergency medical services personnel:** infections among healthcare workers have been reported and they can be a potential source of infection for vulnerable patients. Also, increased absenteeism in this population could reduce healthcare system capacity
- **All people from 6 months through 24 years of age**
  - (1) **Children from 6 months through 18 years of age** - there have been many cases of novel H1N1 influenza in children, and they are in close contact with each other in school and day care settings, which increases the likelihood of disease spread
  - (2) **Young adults 19 through 24 years of age** - there have been many cases of novel H1N1 influenza in these healthy young adults and they often live, work, and study in close proximity, and they are a frequently mobile population
- **Persons aged 25 through 64 years who have health conditions associated with higher risk of medical complications from influenza**

**Transmission:** Flu viruses are spread mainly from person to person through coughing or sneezing by people with influenza. Transmission via large-particle droplets requires close contact between source and recipient persons because droplets do not remain suspended in the air and generally travel only a short distance (< 6 feet). Sometimes people may become infected by touching something – such as a surface or object – with flu viruses on it and then touching their mouth or nose. The latest information available indicates that Novel H1N1 (Swine) Flu is spread very similarly to Seasonal Flu viruses.

**Incubation period:** The incubation period for Seasonal and Novel H1N1Influenza infection is from 1-5 days from the time of contact to onset of symptoms.

**Symptoms:** Symptoms caused by infection with Novel H1N1 Flu appear to be similar to those of seasonal Flu. However, in addition to these common symptoms, Novel H1N1 Flu causes gastrointestinal symptoms in about 1/4 of patients. Symptoms of 268 adult patients with confirmed Novel H1N1 Flu reported to the CDC through August of 2009 are shown in the table below:

<b><u>Symptom</u></b>	<b><u>Number (%)</u></b>
Fever	249 (93%)
Cough	223 (83%)
Shortness of Breath	145 (54%)
Fatigue/Weakness	108 (40%)
Chills	99 (37%)
Myalgias	96 (36%)
Rhinorrhea	96 (36%)
Sore Throat	84 (31%)
Headache	83 (31%)
Vomiting	78 (29%)
Diarrhea	64 (24%)
Wheezing	64 (24%)

It is important to remember that infants and young children as well as the elderly and immunocompromised patients with influenza may not present with the typical Flu symptoms listed above. For example, although many infants and young children with influenza will have fever and respiratory symptoms, other respiratory viral infections as well as bacterial infections often present similarly. Signs and symptoms to look for in infants and young children with influenza

include the above adult signs and symptoms in addition to irritability, listlessness, lethargy, poor oral intake, sleeping more than usual and signs of dehydration such as decreased numbers of wet diapers, tacky mucous membranes, glazed, sunken-appearing eyes, sunken fontanelle, pallor and/or mottling of the skin, delayed capillary refill, tachypnea and tachycardia.

### **Influenza-Like Illness (ILI):**

The CDC advises all healthcare workers with direct patient contact to become familiar with the signs and symptoms of "Influenza-Like Illness" or "*ILI*" for short. ILI is defined by the CDC as:

#### *Rapid Onset of*

- Temperature  $\geq 100.0$  F
- Cough
- Sore throat

In the absence of a known cause other than influenza

Additional symptoms associated with seasonal and Novel H1N1 Influenza that should be assessed in patients presenting with ILI:

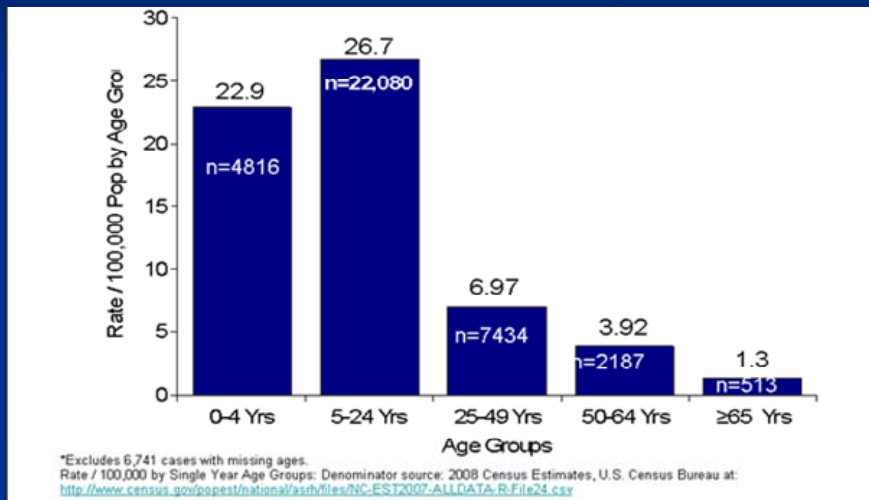
- Fatigue, body aches, chills, congested/runny nose, headache
- 24% of patients with H1N1 Flu will also have vomiting and/or diarrhea

In addition to clinicians, ambulatory clinic registration and hospital admissions personnel should be trained to quickly screen all patients that they see using this simple description of a Flu-like illness. They should be empowered to provide any patients suspected of having a Flu-like illness as a result of this screening with a regular surgical mask to prevent contagion to others in the waiting area as well as to prevent unprotected exposures for clinic or hospital healthcare workers. This simple act may prevent multiple vitally important healthcare workers from falling ill to the Flu, as well as reducing the need for antiviral chemoprophylaxis for exposed healthcare workers. Front-line personnel should be informed of their critically important role in keeping the entire clinic workforce healthy and operating smoothly by performing ILI screening on every patient presenting to the clinic or hospital admissions areas.

### **H1N1 Influenza: Who Gets Sick and What are We Seeing?**

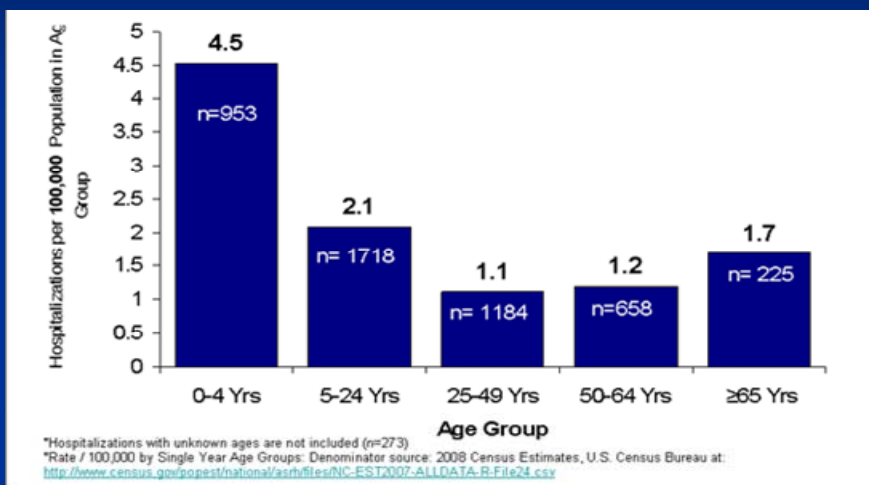
The following slides from the CDC's Novel H1N1 website illustrate what age groups become sick most often with Novel H1N1 Influenza, what age patients are at greatest risk for hospitalization, and what age patients are at greatest risk for mortality from Novel H1N1. Note that persons 0-24 years of age constitute the largest proportion of Novel H1N1 infection and hospitalization, but that the highest mortality is in young adults and those of middle age. This is distinctly different from seasonal influenza, which typically causes the highest mortality in the very young (less than 2 years of age) and those over 65 years of age.

## Novel H1N1 US Confirmed and Probable Case Rate by Age Groups



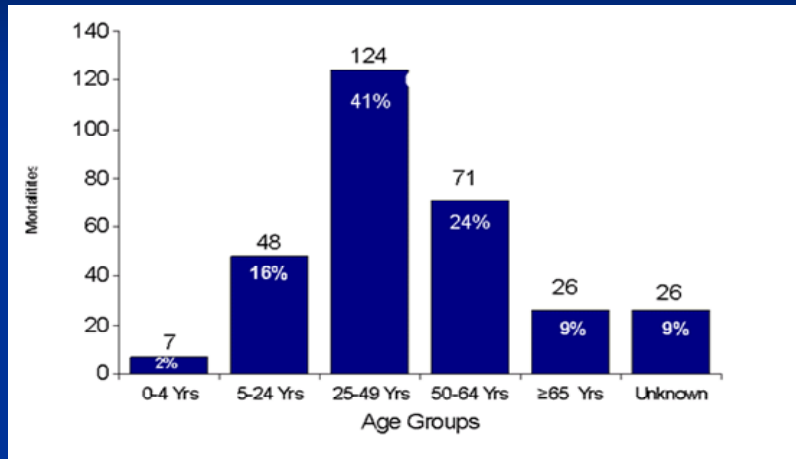
Accurate as of July 31, 2009; source: CDC <http://www.cdc.gov/h1n1flu/surveillanceqa.htm>

## Novel H1N1 U.S. Hospitalization Rate per 100,000 Pop., By Age Group



Accurate as of July 31, 2009; source: CDC <http://www.cdc.gov/h1n1flu/surveillanceqa.htm>

## Novel H1N1 U.S. Mortality Rate by Age Group



% represents proportion of total mortality; Accurate as of July 31, 2009  
 Source: CDC <http://www.cdc.gov/h1n1flu/surveillanceqa.htm>

What these slides do not show is the diagnoses for those sickened and succumbing to Novel H1N1 influenza infection. New information is emerging to show more specifically what types of adult and pediatric patients Novel H1N1 influenza is affecting most seriously, as well as what types of illnesses these patients are experiencing. Most patients experience upper and lower respiratory tract illness typical for influenza and many recover at home without any specific therapy other than rest, fluids and antipyretics. But some patients will go on to develop more severe illnesses requiring hospital admission. A study of 1,557 laboratory-confirmed Adult and Pediatric H1N1 cases in the spring of 2009 in Chicago revealed the following:

- Highest hospitalization rates:
  - children aged 0-4 years (25 per 100,000), then
  - children aged 5-14 years (11 per 100,000)
- Of 205/1,557 (13%) patients hospitalized:
  - median age was 16 (range 24 days to 91 years)
  - 40/205 (20%) admitted to an intensive-care unit
  - 9/40 (22.5%) admitted to the ICU required mechanical ventilation
  - duration of hospitalization: 1 – 11 days (median: 2 days)
  - 14/205 (7%) were pregnant women

<http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5833a1.htm>

A Michigan study of adult patients requiring admission to an intensive care unit revealed the following diagnoses: dehydration, severe pneumonia, acute respiratory distress syndrome (ARDS), multiorgan dysfunction syndrome

(MODS), pulmonary embolism, and even death. This study also pointed to a possible link between ICU admission and obesity:

<http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5827a4.htm>

Spontaneous abortion and deaths have occurred in pregnant women:

<http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5827a4.htm>

Neurologic complications have been reported recently in children, including altered mental status, seizures, visual hallucinations and ataxia:

<http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5828a2.htm>

A recent study of 36 pediatric deaths in the US associated with Novel H1N1 infection revealed that 24/36 (67%) children in the study who died had one or more of the high-risk medical conditions associated with severe or life-threatening disease from influenza, and 22/24 (92%) of the children with high-risk medical conditions had neurodevelopmental conditions, including cerebral palsy, spastic quadriplegia, developmental delay, seizure disorder, muscular dystrophy, and static encephalopathy. Another important finding of this study was that 10/23 (43%) patients with culture or pathology results reported had a laboratory-confirmed secondary bacterial infection, including *Staphylococcus aureus* (five, including three methicillin-resistant *S. aureus*), *Streptococcus pneumoniae* (three), *Streptococcus pyogenes* (one), and *Streptococcus constellatus* (one). Among the eight children aged  $\geq 5$  years who did not have a high-risk medical condition, six had a laboratory-confirmed invasive bacterial coinfection, including four with *S. aureus*; the other two children either had no specimens collected or information regarding bacterial coinfection was unavailable. Among the seven children aged  $< 5$  years who died, two had a laboratory-confirmed bacterial coinfection; neither child had a high-risk medical condition. **These findings point to the importance of clinical vigilance for bacterial secondary infection in patients with serious influenza infection. Stated more specifically, physicians should be especially vigilant for patients in the ambulatory or hospital setting who appear to be recovering from their influenza infection, but then develop new fever and/or signs of clinical deterioration. This progression of events should raise the real possibility of a potentially life-threatening bacterial infection; appropriate clinical cultures should be obtained and empiric antibiotic therapy initiated for such patients:**

<http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5834a1.htm>

**Novel H1N1 Experience from the Southern Hemisphere:** as countries in the southern hemisphere emerge from their winter Flu season, we are learning more about what we might experience this winter. Findings of a US government H1N1 impact study revealed the following information regarding Novel H1N1 infection in Argentina, Australia, Chile, New Zealand and Uruguay:

- After mid-July (mid-January for us) disease activity in most parts of the country decreased

- The Novel H1N1 virus has not changed, or mutated, significantly so far
  - The most at-risk patients in the Southern Hemisphere are similar to those seen in the US (as discussed above)
  - Healthcare systems experienced stress, but it was generally geographically isolated and relatively short-lived
  - Commonly-used community mitigation measures included:
    - school closures
    - cancellation of mass gatherings
    - isolation and quarantine
    - other social distancing measures
    - border screening and temporary flight cancellations
  - All countries experienced some time-limited and/or geographically-isolated socioeconomic effects, including decreased tourism
- <http://www.flu.gov/professional/global/final.pdf>

**Duration of symptoms:** The worst symptoms from the Flu last 3-5 days, but some patients will experience Flu symptoms for 7-10 days or longer, depending on age, immune status and complications such as secondary bacterial infection.

**Viral shedding:** According to the CDC, “people infected with seasonal and novel H1N1 flu shed virus and may be able to infect others from 1 day before getting sick to 5 to 7 days after. This can be longer in some people, especially children and people with weakened immune systems and in people infected with the new H1N1 virus”. The latest evidence in patients with Novel H1N1 influenza is that persistence of cough may be an indicator of ongoing virus shedding. Further studies are being completed to address this issue.

**Virus Survival on Environmental Surfaces:** The CDC quotes studies showing that Influenza virus can survive on environmental surfaces and can infect a person for 2 to 8 hours after being deposited on the surface. This makes surface decontamination in the environment of someone sick with the Flu an important component in the prevention of spread of the Flu virus.

**Prevention of Influenza Virus Infection:** The CDC recommends several basic behaviors in order to prevent becoming ill with the Flu and spreading it to your co-workers, patients, or your own family members:

- Cover your nose and mouth with a facial tissue when you cough or sneeze. Throw the tissue in the trash after you use it. If tissues are not available, cough or sneeze into the bend of your elbow, not into your hands.
- Wash your hands often with soap and water, especially after you cough or sneeze. Alcohol-based hand sanitizers are effective against the influenza virus and have the advantage of being available as portable, personal-sized dispensers that can be carried with you wherever you go.
- Avoid touching your eyes, nose or mouth. Germs spread this way.

- Try to avoid close contact with sick people.
- If you are sick with flu-like illness, CDC recommends that you stay home for at least 24 hours after your fever is gone except to get medical care or for other necessities. (Your fever should be gone without the use of a fever-reducing medicine.) Keep away from others as much as possible to keep from making others sick. **Note:** if you are a healthcare worker who gets sick with the Flu, you must stay home from work for 7 days or until symptoms have resolved, *whichever is longer*.
- Get vaccinated for *both* seasonal and Novel H1N1 Influenza

### **Influenza Vaccination**

Influenza vaccination remains the single best preventative measure against infection with Influenza virus. This season, there is potential that we will all have to receive an unprecedented two (2) and perhaps three (3) vaccinations in order to provide full protection from seasonal (1 vaccine) and Novel H1N1 (1 or 2 vaccines) Influenza infection. Recent studies of the Novel H1N1 vaccine in healthy adult volunteer subjects are reporting production of protective antibody levels with only a single vaccination, but it remains unclear whether a single dose schedule will be sufficient for pregnant women and children. Studies in these high risk groups are ongoing:

<http://content.nejm.org/cgi/content/full/NEJMoa0907413>

We hope that a single-dose Novel H1N1 vaccine schedule will be announced soon. We will keep you up to date on this issue in future postings.

Seasonal Influenza Vaccine: The CDC recommends that the following persons receive seasonal influenza vaccination:

- Children aged 6 months up to their 19th birthday
- Pregnant women
- People 50 years of age and older
- People of any age with certain chronic medical conditions
- People who live in nursing homes and other long-term care facilities
- People who live with or care for those at high risk for complications from flu, including:
  - Health care workers
  - Household contacts of persons at high risk for complications from the flu
  - Household contacts and out of home caregivers of children less than 6 months of age (these children are too young to be vaccinated)

There will be no shortage of seasonal influenza vaccination for the 2009-2010 Flu season. Vaccine is now available. All healthcare workers should get their vaccine and encourage their colleagues and patients to receive their vaccinations as soon as possible. Adult and Pediatric vaccine studies have demonstrated protective antibody levels lasting for at least one year after vaccination, so do not wait to get your seasonal Flu vaccine. You can receive your seasonal influenza vaccine through your usual provider route. Seasonal influenza vaccine will be provided to UK Chandler Hospital Employees who bring their badges to the hospital's north lobby. Scheduled vaccine administration times and other vaccine-related information can be found on the Infection Prevention and Control website: <http://www.hosp.uky.edu/ipc/index.html>

Novel H1N1 Influenza Vaccine: The CDC recommends that the following persons receive Novel H1N1 influenza vaccination *if availability is unlimited*:

- pregnant women,
- people who live with or care for children younger than 6 months of age
- health care and emergency medical services personnel
- persons between the ages of 6 months through 24 years of age
- people from ages 25 through 64 years who are at higher risk for novel H1N1 because of chronic health disorders or compromised immune systems

Because it is expected that Novel H1N1 vaccine will initially be in limited supply, the vaccine will be offered only to the highest risk persons (healthcare workers and patients) initially. Once vaccine delivery improves and supplies have increased, the above recipient priority list will be used. In the mean time, the CDC recommends that the following persons receive Novel H1N1 vaccine *in a limited availability situation*:

- pregnant women
- people who live with or care for children younger than 6 months of age
- health care and emergency medical services personnel with direct patient contact
- children 6 months through 4 years of age
- children 5 through 18 years of age who have chronic medical conditions

It is not anticipated that there will be a shortage in Novel H1N1 vaccine. For US vaccination, approximately 195 million doses have been ordered by the Federal Government. This is enough vaccine to cover all high risk persons in the US. However, because the virus grows slowly in chick embryos, vaccine production has been slowed and clinical trials assessing efficacy and safety of the vaccine were therefore delayed. From information learned at the *Governor's Pandemic Influenza Summit* in Frankfort, Kentucky, held September 3, 2009, we do know the following information regarding H1N1 vaccine. Vaccine will be supplied by at least 4 or 5 different manufacturers and will be shipped in lots of 100 from federal

to state government health officials. Both inactivated IM and attenuated live intranasal vaccines will be available. We will have no choice as to what form of vaccine we receive as an institution. The first lots of vaccine are anticipated to arrive Mid- to late-October, 2009 but it is anticipated that only 30-80 million doses of vaccine will be available initially, to be divided among all US states. 20 million doses are anticipated to be delivered weekly thereafter nation-wide. Facilities wishing to administer vaccines must register with the state health department to receive vaccine, and we have registered at UK to receive/deliver vaccine. Registration is not a guarantee of receipt of vaccine. However, priority for receiving vaccine will be given to facilities serving the greatest number of persons in H1N1 high risk groups. A great number of patients served by the UK Healthcare enterprise certainly qualify under this provision as do its healthcare workers, so we anticipate that we will receive vaccine. Vaccine and administration supplies will be provided free by the federal government; administering facilities are permitted to charge an administration fee reimbursable from the Centers for Medicare & Medicaid Services (CMS). A "shot card" will be given to vaccine recipients with each injection. State health officials will require documentation of vaccinations given by all administering facilities with a simple weekly faxed report. Vaccine Adverse Event Reporting System (VAERS) reporting will also be required as is usual for any adverse vaccine-related events. Plans are underway for a Novel H1N1 vaccine administration prioritization program at UK. Once these plans have been finalized, more details will follow.

## **Assessment, Triage, Laboratory Testing, Treatment and Chemoprophylaxis of Patients with Suspected or Documented Influenza**

The Centers for Disease Control and Prevention (CDC) recommends that priority for laboratory testing and for antiviral therapy for influenza be given to persons who 1) require hospitalization or 2) are at high-risk for severe disease from *seasonal* influenza, even if infection with *Novel H1N1* influenza is suspected since there is considerable overlap between high risk patient categories for each virus: <http://www.cdc.gov/h1n1flu/identifyingpatients.htm>  
<http://www.cdc.gov/h1n1flu/recommendations.htm>

CDC recommendations are *guidelines* based on existing evidence and expert opinion. They are not “set-in-stone” mandates of how to practice medicine and it should be anticipated by the practicing clinician that guidelines will change with time as knowledge about Novel H1N1 infection increases. Guidelines help clinicians in deciding how to care for patients. However, each clinician should use his or her own professional judgment when making clinical decisions about who to test and who to treat when seeing patients suspected of or documented as having influenza.

**Clinical decisions about who/how to test and who/how to treat should be based on several key elements:**

- 1.) Does the patient have an Influenza-Like Illness (ILI)?**
- 2.) Is the patient considered to be in a population at risk for serious or life-threatening infection (“high risk population”) from influenza?**
- 3.) Is the patient a healthcare worker with direct patient care duties?**
- 4.) Does the patient require hospitalization?**
- 5.) What influenza viruses are presently circulating in the community?**

The evaluation and treatment algorithm (see, “***Algorithm for Evaluation and Treatment of Patients with Suspected Influenza Infection***”) that accompanies this primer is based on the above-mentioned CDC recommendations and these key elements with modifications to best serve our patient and healthcare worker populations. The algorithm is offered as an aid in guiding clinical decision making for a complex and rapidly evolving influenza disease environment. Individual clinical judgment should be used in making all testing and treatment decisions.

### **1.) Does the patient have an Influenza-Like Illness (ILI)?**

The first step is to decide whether a patient fulfills criteria for an Influenza-Like Illness (ILI). A variety of respiratory and other viral and bacterial illnesses may present similarly to infection with influenza, but assessment for ILI is an important first step in the evaluation of a patient suspected of having infection with influenza. Screening for ILI can be accomplished with a simple assessment narrative that should be taught to front-line (e.g. clinic

registration, admissions personnel) individuals who have first contact with a patient presenting for treatment. This simple step avoids exposing healthcare workers and other non-infected patients to influenza. If a patient is thought to have an ILI, they should be immediately offered a surgical mask to wear, and the healthcare workers seeing the patient should practice Enhanced Droplet-Contact Precautions when evaluating and examining the patient.

**2/3.) Is the patient considered to be in a population at risk for serious or life-threatening infection (“high risk population”) from influenza, or are they a healthcare worker with direct patient contact?**

If the patient is not in a high risk group for serious influenza infection and does not require hospitalization, they should be sent home without testing or antiviral treatment, as per CDC recommendations. This is because we have an extremely limited supply of testing supplies and antiviral medications, and most people who develop serious complications with influenza infection fall into one of the high risk groups. Although CDC does not list healthcare workers (HCW) in their recommendations for who should be tested and treated, it was felt that in order to protect our workforce from unnecessary absence from work, all HCW’s with an ILI should be offered testing to distinguish whether they have influenza, in which case they would have to be away from work for at least 7 days, or another respiratory viral infection, in which case they could return to work once they are feeling better and are able to work. This addition to the CDC recommendations will become critical if we experience the anticipated 30-40% workforce shortage during the peak of the pandemic.

**4.) Does the patient require hospitalization?**

As per CDC guidelines, all patients with ILI who are sick enough to require hospitalization should be tested for influenza and begun on empiric antiviral therapy while awaiting test results. In order to protect HCW and other patients from potential infection with influenza, these patients should be placed in Enhanced Droplet-Contact Isolation.

**5.) What influenza viruses are presently circulating in the community?**

Because antiviral susceptibility varies among Influenza A viruses (Novel H1N1, Seasonal H1N1, H3N2) and Influenza B virus, it is important to know which viruses are circulating in the community at all times in order to make appropriate antiviral therapy choices. The UK Chandler Hospital Clinical Microbiology Laboratory will monitor influenza types throughout the Flu season and clinicians will be kept informed on an ongoing basis as to the influenza subtypes circulating in the population.

## **Laboratory Testing for Patients with Suspected Influenza**

- **Rapid Influenza EIA** testing offers the convenience of point-of-care testing with rapid turn-around, but suffers from unacceptably low sensitivity (10-70%) creating a dangerous environment of under-diagnosis (and, therefore potential under-treatment of high-risk patients) and false-negative results:

[http://www.cdc.gov/h1n1flu/guidance/rapid\\_testing.htm](http://www.cdc.gov/h1n1flu/guidance/rapid_testing.htm)

<http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5830a2.htm>

- Point-of-care rapid EIA testing for influenza continues in some enterprise patient care settings despite the low sensitivity issue with these tests; when a decision is made to continue rapid influenza testing, it is imperative that the clinician and the patient are well-informed about the low sensitivity of this testing method

- The UK Chandler Clinical Microbiology Laboratory no longer offers rapid influenza EIA testing

- **Influenza culture** offers an alternative to rapid influenza EIA testing, but culture is not as rapid (24-48 hours) as EIA testing (immediate) or influenza PCR testing (as little as 2 hours to results), requires greater laboratory time to set up and interpret results, and is limited by the quantity of cell culture media attainable and maintainable; importantly, cell culture alone also cannot distinguish between Novel H1N1 Influenza A and seasonal Influenza A (H1N1, H3N2) subtypes

- **Influenza RT-PCR** testing offers significant benefits over rapid influenza EIA testing and influenza culture, including high sensitivity and specificity, potential for rapid turn-around including rapid distinction between Influenza A and Influenza B types; RT-PCR testing for influenza is the priority method of testing recommended by Infectious Diseases Society of America (IDSA) guidelines:

<http://www.journals.uchicago.edu/doi/pdf/10.1086/598513>

One of the most important advantages of RT-PCR testing beyond rapid assessment of the presence of influenza A or B in a clinical sample is that a PCR kit is available for in-house testing that will allow determination of influenza A subtypes (i.e. Novel H1N1 vs. Seasonal H1N1, H3N2 viruses). This capability will be critical as we enter the winter months because Influenza A subtype determination will enable us to know exactly when we start seeing co-circulation of Novel H1N1 and seasonal Influenza A viruses; this is vital information because these viruses have distinctly different antiviral susceptibilities that can only be predicted once influenza subtype determination is performed. Accurate and timely assessment of influenza subtype early in the course of a patient's illness is extremely important because having this information enables clinicians caring for critically ill hospitalized patients and high-risk outpatients to determine the most appropriate antiviral therapy on a case-by case basis, as well as limiting unnecessary use of antiviral agents that may result in critical antiviral shortages,

unnecessary pharmacy cost, unwanted patient CNS and GI antiviral side-effects, and development of antiviral resistance; these practices are in keeping with recent recommendations of the President's Council of Advisors on Science and Technology in their August 7, 2009 report to President Obama which calls for clarification and strengthening of guidelines for use of antiviral drugs, "*including preservation of limited supply for those in greatest need*"<sup>1</sup>:

[http://www.whitehouse.gov/assets/documents/PCAST\\_H1N1\\_Report.pdf](http://www.whitehouse.gov/assets/documents/PCAST_H1N1_Report.pdf)

### **Additional Notes on Testing Patients with Influenza-Like Illness**

- **Protection of healthcare workers:** Before obtaining a patient sample, the healthcare worker performing the sampling must don personal protective equipment, including a disposable gown, gloves, N95 mask and eye protection to avoid being infected by the patient. Patients often sneeze and/or cough during the sampling procedure, expelling infectious droplets into the air, potentially contacting the healthcare worker's eyes or other mucous membranes and thereby infecting the unprotected healthcare worker.

- **Influenza testing swab type and technique:** The actual type of swab used to obtain a patient sample can influence the accuracy of influenza test results. Calcium alginate swabs are not appropriate. The correct swab to use is the Becton Dickinson 3ML FLOCK FLEX MINITIP swab. The swab is inserted through the nostril and advanced to the nasopharynx of the patient. Once the specimen has been obtained, the swab is removed, the shaft broken at the red-marked score line, and the portion of the swab containing the tip is placed into the accompanying viral transport media. This is then labeled, bagged and sent to the clinical microbiology laboratory. Further details on the swab and proper technique for obtaining specimens may be viewed here:

<http://www.hosp.uky.edu/ipc/Documents/New%20NP%20culture%20swab.ppt>

- **Testing during a pandemic period:** CDC guidelines recommend RT-PCR testing for influenza for all hospitalized patients; we also are recommending that all high risk outpatients and healthcare workers with ILI be tested for reasons explained above. This potentially means that more samples may be submitted than can reasonably be tested by the laboratory. All efforts will be made by the clinical microbiology laboratory to perform RT-PCR on all clinical samples submitted to the laboratory. However, as a pandemic unfolds, the number of patients eligible for testing by CDC criteria may exceed the capacity of the clinical microbiology laboratory to test all submitted clinical samples. In such a setting, it may be necessary for the laboratory to limit testing only to samples from high risk hospitalized or other selected patients in order to maintain specimen throughput and release results to treating clinicians in a timely manner. The decision to limit testing will be made, if and when necessary, by laboratory directors and clinicians will be notified of any changes in testing policy as they are enacted.

• **Laboratory Testing Specimen Workflow:** Respiratory specimens received by the clinical microbiology laboratory for RT-PCR testing will be subjected to the following:

- A.) Original clinical sample is subjected to RT-PCR to determine presence of Influenza A, Influenza B, and/or Respiratory Syncytial Virus (RSV) [“tri-plex” PCR]
- B.) RSV positive samples resulted as such
- C.) Influenza B positive samples resulted as such
- D.) Influenza A positive samples are next:
  - 1. “reflexed” to additional PCR test to determine Influenza A subtype as Novel H1N1, or Seasonal Influenza A (H1N1) or (H3N2)
  - 2. resulted as such by updating original RT-PCR result to include subtype confirmation

### **Treating Patients with Influenza and Influenza-Like Illness**

Treatment of suspected or documented influenza infection is recommended by the CDC for:

- 1.) all hospitalized patients and,
- 2.) all high risk patients (whether hospitalized or managed as outpatients)

<http://www.cdc.gov/h1n1flu/recommendations.htm>

We are also recommending that healthcare workers with ILI receive treatment with appropriate antiviral medication(s) in order to shorten the duration of their clinical illness, decrease viral shedding, and reduce the risk of complications from influenza. Treatment of healthcare workers would potentially speed recovery from the Flu and minimize complications that may keep them from rejoining a strained, reduced workforce in as short a time as possible (7 days minimum per recommendations from CDC). For these reasons, we are recommending that healthcare workers with ILI receive treatment. We agree with CDC recommendations that, “Treatment should be initiated empirically when the decision is made to treat patients who have illnesses that are clinically compatible with influenza. Treatment should not await laboratory confirmation because laboratory testing can sometimes delay treatment and because a negative rapid test does not rule out influenza.”

### **Antivirals for Treatment of Influenza and Influenza-Like Illness**

Presently, 4 antiviral medications are available to treat patients with suspected or documented influenza. These are the adamantanes rimantadine (Flumadine) and amantadine (Symmetrel), and the neuraminidase inhibitors oseltamivir (Tamiflu) and zanamivir (Relenza). A complicating factor in using these medications is that

antiviral resistance varies with Influenza virus type and subtype as shown in Table 1.

**Table 1. Antiviral Susceptibilities for Novel H1N1 Influenza A virus and Seasonal Influenza Viruses**

	<b>Pandemic Virus</b>	<b>Seasonal Influenza Viruses</b>		
<b>Antiviral</b>	Novel Flu A (H1N1)	Influenza A (H1N1)	Influenza A (H3N2)	Influenza B
<b>Amantadine/Rimantadine</b>	Resistant	Susceptible	Resistant	Resistant
<b>Oseltamivir</b>	Susceptible	Resistant	Susceptible	Susceptible
<b>Zanamivir</b>	Susceptible	Susceptible	Susceptible	Susceptible

### **Antiviral Treatment for Novel H1N1 Influenza**

As can be seen from the table, Novel H1N1 influenza virus is resistant to amantadine and rimantadine, but susceptible to both oseltamivir and zanamivir. Note that this is the same pattern as is seen with seasonal H3N2 Influenza A virus and Influenza B virus. Therefore, as long as Novel H1N1 Influenza is the only virus circulating in the community, or Novel H1N1 is joined by seasonal influenza A (H3N2) and/or influenza B virus in co-circulation, monotherapy with either oseltamivir or zanamivir is appropriate for treatment of patients with suspected or documented influenza virus infection. It is anticipated that Novel H1N1 will be the only influenza virus in circulation until this winter, when seasonal influenza viruses are likely to appear. When and if *seasonal* influenza A (H1N1) virus appears this winter, empiric antiviral therapy decisions must necessarily change (see below) in order to reflect the different antiviral resistance pattern of this virus relative to Novel H1N1, seasonal H3N2 or influenza B. The clinical microbiology laboratory will notify clinicians when co-circulation of Novel H1N1 and seasonal influenza viruses is detected, and additional empiric therapy recommendations will be disseminated in future updates to this primer. As of mid-September 2009, all patients presenting with influenza who have positive RT-PCR or rapid EIA tests may be presumed to be Novel H1N1 influenza, as we have not yet begun to see the appearance of seasonal influenza viruses. Keep in mind that influenza viruses may rapidly develop resistance to antiviral agents to which they were formerly susceptible, and this may happen within any given influenza season. We will update clinicians on emerging antiviral resistance should this become an issue. Further information can be found at the following site: <http://www.cdc.gov/h1n1flu/recommendations.htm>

### **Antiviral Treatment for Influenza with Multiple Influenza Viruses Circulating in the Community**

Once multiple influenza viruses are circulating in the community, empiric antiviral therapy decisions may need to be adjusted due to variability in

antiviral resistance among viruses as discussed above. In this setting, zanamivir remains an appropriate choice for monotherapy because *all* influenza viruses are susceptible to zanamivir. However, seasonal influenza A (H1N1) resistance to oseltamivir makes monotherapy with this agent inadequate if this virus begins circulating in the community. In the setting of co-circulation of Novel H1N1 and seasonal H1N1 influenza virus, empiric therapy with either zanamivir or combination therapy using oseltamivir plus either amantadine or rimantadine becomes necessary. Rimantadine is often preferred over amantadine in this setting due to lower incidence of (primarily neurologic) side-effects. Note that zanamivir is not approved for treatment of influenza in children under 7 years of age, nor is it possible to administer this medication to an intubated, mechanically ventilated patient. To reiterate, we will be closely monitoring which influenza viruses are circulating throughout the season and will update clinicians with new empiric therapy recommendations frequently as the situation changes. Further information can be found at the following site:

<http://www2a.cdc.gov/HAN/ArchiveSys/ViewMsgV.asp?AlertNum=00279>

### **Which Antiviral Medication(s) to Use is/are Based on Knowledge of Influenza Viruses Presently Circulating in the Community**

#### **Novel H1N1, Seasonal H3N2 and/or Influenza B circulating only:**

oseltamivir

OR:

zanamivir

#### **Co-circulation of Novel H1N1 and Seasonal H1N1 Influenza Virus:**

##### **Empiric therapy\*:**

zanamivir monotherapy

OR:

oseltamivir PLUS either amantadine or rimantadine

\*empiric therapy should be later adjusted based on subsequent influenza A virus subtype identified by the laboratory, or local surveillance data indicating which seasonal influenza type/subtype is circulating. Detailed dosing information for all influenza antiviral agents, including special provisions for treatment of infants less than one year of age, may be found at the following site: <http://www.cdc.gov/h1n1flu/recommendations.htm>

## **Antiviral Chemoprophylaxis for Persons Exposed to Others with Influenza**

Antiviral chemoprophylaxis refers to the practice of prescribing antiviral medications to individuals who 1.) have experienced a close contact exposure and 2.) are at high risk for serious illness with influenza or who work in a setting (such as the healthcare setting) with high potential for spread of their influenza infection to other susceptible and high risk individuals. Chemoprophylaxis, when given appropriately, can prevent exposed individuals from developing symptoms of influenza and can reduce their risk of spreading influenza to others, while simultaneously allowing the exposed individual's immune system to develop protective antibodies to the influenza virus. The infectious period for persons infected with the 2009 H1N1 virus appears to be similar to that observed in studies of seasonal influenza. Infected persons may shed influenza virus, and potentially be infectious to others, beginning 1 day before they develop symptoms to up to 7 days after they become ill. Children, especially younger children, and immunocompromised individuals can shed influenza virus for longer periods. However, in the context of guidance for chemoprophylaxis decisions, the CDC defines the *infectious period* for influenza as 1 day before until 24 hours after fever ends.

- Post exposure antiviral chemoprophylaxis with either oseltamivir or zanamivir can be considered for the following:
  - Persons who are at higher risk for complications of influenza and are a close contact of a person with confirmed, probable, or suspected 2009 H1N1 or seasonal influenza during that person's infectious period.
  - Health care personnel, public health workers, or first responders who have had a recognized, unprotected close contact exposure to a person with confirmed, probable, or suspected 2009 H1N1 or seasonal influenza during that person's infectious period (see plans for exposed UK healthcare staff and physicians below under "*Guidance for UK Healthcare Workers with Suspected Novel H1N1 Infection or Exposure*")
- Antiviral agents should not be used for post exposure chemoprophylaxis in healthy children or adults based on potential exposures in the community, school, camp or other settings.
- Chemoprophylaxis generally is not recommended if more than 48 hours have elapsed since the last contact with an infectious person.
- Chemoprophylaxis is not indicated when contact occurred before or after, but not during, the ill person's infectious period as defined above.

For further information on antiviral chemoprophylaxis, visit the updated CDC web site: <http://www.cdc.gov/h1n1flu/recommendations.htm>

## **Infection Prevention and Control Measures**

**Screening Patients for Influenza-Like Illness (ILI):** every effort should be made to train all healthcare workers as well as registration and admissions personnel to screen for and recognize ILI using the definitions provided in this primer. Patients suspected of ILI should have a regular surgical mask placed over their mouth and nose, as this has been shown to be effective at preventing patients with influenza from infecting others:

<http://www.journals.uchicago.edu/doi/pdf/10.1086/600041>

Consideration should be given to triaging patients with ILI to a separate waiting area from other patients. In the ambulatory setting, examination rooms into which ILI patients are placed should have appropriate (Enhanced Droplet-Contact; see below) isolation precautions signage placed on the examination room door or at the entry way to the room to alert healthcare workers entering the room to don appropriate personal protective equipment. Post “cover your cough” and hand hygiene signs in waiting areas and provide educational materials, hand sanitizer and facial tissues to patients to reduce the potential for spread of infection. Colorful signs are available for download and dissemination here: <http://www.hosp.uky.edu/ipc/Album/WallyCat-hand-wash-poster-HES.pdf>

And here: <http://www.hosp.uky.edu/ipc/Album/WallyCat-cough-poster-HES.pdf>

**All patients who have an Influenza-Like Illness (ILI) who require admission to the hospital should be placed in Enhanced Droplet/Contact isolation (see below) immediately upon admission. Do not wait for influenza laboratory test results to place admitted patients with ILI into isolation. Ordering any influenza diagnostic test constitutes clinical suspicion that a patient has influenza, and all such patients should be placed in Enhanced Droplet/Contact isolation concomitant with ordering the test.**

**Isolation Precautions: Enhanced Droplet/Contact Precautions-** to be ordered upon Suspicion of Influenza, and when ordering Influenza testing. Enhanced Droplet/Contact Precautions includes the following:

**Private room or cohort patients**

**Door may be kept open**

**Hand hygiene on entering and leaving room**

**\*Standard mask\* and gown for patient care**

**N95 mask and eye protection when performing aerosol-generating procedures** (e.g. nasopharyngeal swabbing, aspiration of respiratory tract, intubation, resuscitation, bronchoscopy, autopsy)

**Gloves for patient care**

**Patient wears mask and gown for transport**

**Dedicate equipment to room if possible**

Enhanced Droplet/Contact Precautions signage may be downloaded from the Infection Prevention and Control website at the following link:

[http://www.hosp.uky.edu/ipc/Documents/ENHANCED%20Droplet\\_Contact%20%2014%2009.pdf](http://www.hosp.uky.edu/ipc/Documents/ENHANCED%20Droplet_Contact%20%2014%2009.pdf)

**Explanation of Surgical Mask Recommendation for Healthcare Workers:**

Some controversy presently exists over which mask, a regular surgical mask or an N95 particulate respirator mask, is most appropriate for preventing spread of H1N1 influenza virus from patients with Novel H1N1 influenza to healthcare workers. The reasons for this are 1.) no definitive studies have been performed to demonstrate which mask is better at preventing spread of the Novel H1N1 virus from patients to healthcare workers, 2.) the exact routes of transmission of Novel H1N1 virus have yet to be clearly delineated, 3.) regular surgical masks are presently recommended for preventing *seasonal* influenza in healthcare workers, and 4.) experts from various organizations disagree in their recommendations on which mask is appropriate. As of their May 13 website posting, the CDC recommends that,

*“All healthcare personnel who enter the rooms of patients in isolation with confirmed, suspected, or probable novel H1N1 influenza should wear a fit-tested disposable N95 respirator or better.”* [http://www.cdc.gov/h1n1flu/guidelines\\_infection\\_control.htm](http://www.cdc.gov/h1n1flu/guidelines_infection_control.htm)

On July 23, 2009 The CDC’s Healthcare Infection Control Practices Advisory Committee (HICPAC) unanimously adopted the recommendations of the HICPAC Influenza A (H1N1) Working Group with regards to “Interim Guidance for Infection Control for Care of Patients with Confirmed or Suspected Novel Influenza A (H1N1) Virus Infection in a Healthcare Setting” which stated the following:

- Healthcare personnel should wear a surgical mask when caring for patients with suspected or confirmed cases.
- An N95 respirator is recommended for select procedures that are potentially aerosol-generating (e.g. bronchoscopy, intubation, CPR, open airway suctioning, and sputum induction).
- Healthcare personnel should adhere to standard and droplet precautions for 7 days after the onset of illness or until symptoms resolve, whichever is longer.

On September 3, 2009 the Institute of Medicine (IOM) published their report on the subject entitled, “*Respiratory Protection for Healthcare Workers in the Workplace Against Novel H1N1 Influenza A*”, in which they endorse the May 13th CDC recommendation that healthcare workers don an N95 mask to protect themselves when entering the room of a patient with Novel H1N1 influenza. A copy of the IOM report may be downloaded for free by registering at this site: <http://www.iom.edu/CMS/3740/71769/72967.aspx>

However, leading infection prevention and control professionals from the Society for Healthcare Epidemiology of America (SHEA), Association for Professionals in Infection Control and Epidemiology (APIC), American College of Occupational and Environmental Medicine (ACOEM) and the Infectious Diseases Society of America (IDSA) published a joint position statement in which they recommend to the CDC that Droplet Precautions (surgical mask) for healthcare workers to protect them from Novel H1N1 infection are appropriate for routine care of a patient, and that N95 masks should be worn during aerosol-generating procedures: [http://www.shea-online.org/Assets/files/policy/FINAL\\_Joint\\_SHEA\\_APIC\\_IDSA\\_ACOEM\\_Position\\_Statement\\_High\\_Risk\\_HCW.pdf](http://www.shea-online.org/Assets/files/policy/FINAL_Joint_SHEA_APIC_IDSA_ACOEM_Position_Statement_High_Risk_HCW.pdf)

These recommendations are in keeping with current recommendations from the World Health Organization (WHO): [http://www.who.int/csr/resources/publications/SwineInfluenza\\_infectioncontrol.pdf](http://www.who.int/csr/resources/publications/SwineInfluenza_infectioncontrol.pdf)

As seen above, we have decided to go with HICPAC, WHO and SHEA/APIC/ACOEM/IDSA recommendations for mask usage to protect healthcare workers from Novel H1N1 influenza virus infection. As further studies are undertaken to resolve this issue, our recommendations may change, and you will be updated accordingly.

### **Visitation Policy During the Novel H1N1 Pandemic**

As of Friday, September 18, 2009, Influenza activity in the State of Kentucky is officially designated as “widespread.” What this means is that large numbers of patients with influenza (presently all Novel H1N1 infection) are being reported from surveillance sites from across the state. This also means that extra precautions must be put in place to protect our patients and our healthcare workforce in order to prevent transmission of influenza within the hospital and clinics of the UK Healthcare Enterprise. **Effective immediately and until further notice, visitation of patients in all hospital areas is restricted to only one visitor at a time. No one under the age of 18 will be allowed to visit unless such an individual is the parent of a patient, because school age children represent one of the highest risk groups for shedding and spreading influenza to others.** Compassionate visitation exceptions will be made on a case-by-case basis, and patient information will be distributed to explain this policy to parents, family members and visitors of our patients.

## Guidance for UK Healthcare Workers with Suspected Novel H1N1 Infection or Exposure

Healthcare workers should be monitored and should self-monitor for development of symptoms consistent with an influenza-like illness. If such symptoms develop, the healthcare worker should do the following:

- Do not come to work if you have ILI, and notify your supervisor if you develop Flu-like symptoms at home
- If you become sick at work:
  - Notify your supervisor
  - Suspend patient care duties immediately
  - Place a surgical mask over your nose and mouth
  - Get tested for Influenza by RT-PCR and get yourself evaluated so that you can receive empiric antiviral therapy while you are waiting for Influenza test results\*
  - Go home
  - If you are documented as having Influenza, you may not return to work for 7 days OR until 24 hours after your fever and Flu symptoms have resolved, whichever is longer

\*A plan for rapid testing and evaluation of healthcare workers for influenza-like illness is being developed. Until we have a plan in place, each situation will be dealt with on a case-by-case basis. Please contact Infection Prevention and Control for guidance at 323-6337. More information to follow soon.

Healthcare workers must report suspected *close contact* exposures to someone suspected or documented as having influenza. Examples of such exposures include, but are not limited to living in a household with a person with suspected or documented influenza, examining a patient with suspected or documented influenza without wearing appropriate personal protective equipment (PPE), and working with respiratory equipment and secretions of, or obtaining a respiratory secretions sample from a patient with suspected or documented influenza without wearing appropriate PPE.

The CDC's latest definition of Close Contact (September 8, 2009):

*Close contact, for the purposes of this document*, is defined as having cared for or lived with a person who is a confirmed, probable, or suspected case of influenza, or having been in a setting where there was a high likelihood of contact with respiratory droplets

and/or body fluids of such a person. Examples of close contact include sharing eating or drinking utensils, physical examination, or any other contact between persons likely to result in exposure to respiratory droplets. Close contact typically does not include activities such as walking by an infected person or sitting across from a symptomatic patient in a waiting room or office.

Healthcare workers with a close contact exposure must notify their supervisor, who in turn should notify Infection Prevention and Control at 323-6337 for further guidance, including options for antiviral chemoprophylaxis. In order to protect the health of our healthcare workers and to avoid a potential workforce shortage during an influenza pandemic, it is imperative that healthcare workers who have a close contact exposure to someone with suspected or documented influenza infection be considered for antiviral chemoprophylaxis. Such individuals, even if they are receiving antiviral chemoprophylaxis, should be closely monitored and should self-monitor for onset of influenza-like symptoms. If such symptoms develop, the healthcare worker should follow the guidance above to prevent spread of infection to co-workers and patients. CDC guidelines for post-exposure antiviral chemoprophylaxis can be found at the following link:

<http://www.cdc.gov/h1n1flu/recommendations.htm>

### **Employee Absence and Human Resource Issues**

The greatest challenge that we face this fall and winter as a result of the Novel H1N1 pandemic is likely to be a workforce shortage of up to 30-40% for up to 4-8 weeks during the height of the pandemic. Despite our best efforts to protect our healthcare workforce, absence from work due to influenza infection is likely to be significant, in light of the fact that so many of us will be susceptible until widespread H1N1 vaccination has been accomplished and in light of the CDC recommendation that healthcare workers with influenza stay home from work for 7 days from onset of symptoms or until 24 hours after symptoms have resolved, whichever is longer. Absence from work will undoubtedly cause anxiety among healthcare workers worried about excessive sick leave. Healthcare workers and supervisors are advised to work closely with Human Resources (HR) professionals to resolve absence issues. The UK Human Resources Department has developed a FAQ document to help answer many of the questions related to this issue that they have been fielding. Human Resources FAQ can be viewed at the following link by clicking on the "For Faculty and Staff" link on the left side of the page: <http://www.uky.edu/EM/swineflu.htm>

A short form version of the FAQ information, including important HR links, may be viewed by visiting the Infection Prevention and Control home page and clicking on "Work-Related FAQ's": <http://www.hosp.uky.edu/ipc/index.html>

UK Human Resources main web page is here: <http://www.uky.edu/HR/>

UK Human Resources phone number: 257-9555

## **Pandemic Influenza Planning and Preparation**

**What is a “Pandemic?”** A pandemic is an epidemic that is geographically widespread, occurring throughout a region or throughout the world

An Influenza pandemic can start when three conditions have been met:

- 1.) A new influenza virus subtype emerges
- 2.) The new subtype infects humans, causing serious illness
- 3.) The new subtype spreads easily and sustainably among humans

The 2009 Novel H1N1 virus fulfills each of these criteria, thus the pandemic designation.

**What Can We Expect to See with the Present H1N1 Pandemic?** We can expect to see many of the same things that the southern hemisphere has experienced during their 2009 winter season, including:

- After mid-July (mid-January for us) disease activity in most parts of the country decreased
- No significant genetic mutation has been seen in the Novel H1N1 virus
- The vast majority of Novel H1N1 viruses remain susceptible to oseltamivir and zanamivir
- The most at-risk patients in the Southern Hemisphere are similar to those seen in the US
- Healthcare systems experienced stress, but it was generally geographically isolated and relatively short-lived
- Commonly-used community mitigation measures in the southern hemisphere:
  - school closures
  - cancellation of mass gatherings
  - isolation and quarantine
  - other social distancing measures
  - border screening and temporary flight cancellations
- All countries experienced some time-limited and/or geographically-isolated socioeconomic effects, including decreased tourism

**Healthcare Setting Pandemic Assumptions:** Several burdens on healthcare delivery are to be expected this fall and winter as we enter the anticipated peak in the Novel H1N1 pandemic. Successful planning for an influenza pandemic is based on the following assumptions:

- We will see an overwhelming surge in outpatient/inpatient volume
  - Influenza patients
  - “Worried well” with other respiratory infections
- We will likely experience workforce shortages of up to 30-40% for 4-8 weeks during the height of the pandemic
  - Anticipate taking on tasks that are not usually your responsibility
- We will have to deal with basic supply shortages
  - PPE: masks, gowns, gloves
  - Anything that has to be delivered to the hospital, clinic, or office: medical supplies, food, soap, paper towels, alcohol-based hand sanitizer, toilet paper
  - Viral culture media, rapid influenza tests
  - Antiviral medications
  - Patient ventilators
- We are likely to experience an uncomfortable, if only temporary, diminution of our usual standard of care; “Business *NOT* as usual”

**Pandemic Planning for Healthcare Facilities:** The key to being ready is to start now to develop plans for how your facility, department, service line or care area will deal with the above issues. This involves activation of leaders at all levels to come together and prepare a comprehensive plan in order to be ready. The plans outlined below are by no means comprehensive, but are rather intended to serve as simple outlines of critical focus areas to develop further in your pandemic plan.

### **Ambulatory Setting**

- Know ILI symptoms; look for them in every patient as they arrive
- Educate your entire staff to look for and recognize ILI when they see it
- Develop a rapid, up-front triage system for ILI
  - Train registration personnel to screen each patient
  - Immediately provide surgical masks to ILI patients
  - Designate a separate waiting area for ILI patients
  - Put up “Cover Your Cough” signs, offer patient education materials
- Cross-train all clinic staff so that critical tasks can be completed even with key personnel out sick
- Discourage staff with ILI from coming to work sick
- Work with HR to excuse ILI-related absences

- Develop an Emergency Operations Plan (a.k.a. Continuation of Operations Plan, “COOP”)
  - Designate leadership (and backup) roles
  - Identify critical services that cannot be interrupted
  - Identify non-critical services that can be temporarily suspended in order to focus on critical services
  - Develop a rapid triage plan for patients, rapid patient assessment forms (e.g. UHS, Pediatric Clinic have nice examples), pre-written prescriptions
  - Work with Materials Management to make certain that they have stockpiled critical supplies
  
- Monitor for unexpected surge in ILI patients presenting to your clinic/office
- Establish “threshold” at which “business as usual” is no longer possible and your emergency operations plan goes into effect
- Establish criteria for hospital admission

### **Hospital Setting**

- Develop an Emergency Operations Plan
  - Designate leadership (and backup) roles
  - Identify a “threshold” point at which:
    - Elective surgeries, admissions and procedures are postponed
    - Discharges are expedited (care by parent education, discharge rounds, “middle of the night” discharges)
    - “Double-bunk” bed assignments are made
  
- Stockpile critical supplies
- Develop a ventilator allocation protocol

### **Additional Helpful Pandemic Planning Resources:**

CDC Hospital Pandemic Influenza Planning Checklist:  
<http://www.flu.gov/professional/hospital/hospitalchecklist.pdf>

CDC Medical Offices and Clinics Pandemic Influenza Planning Checklist:  
<http://www.pandemicflu.gov/professional/pdf/medofficesclinics.pdf>

CDC: 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>

### **Important Web-Based Resources**

CDC 2009 H1N1 Influenza Main Page: <http://www.cdc.gov/h1n1flu/>

CDC Seasonal Influenza Main Page: <http://www.cdc.gov/flu/>

Kentucky Department of Public Health's Health Alerts Main Page:  
<http://healthalerts.ky.gov/>

University of Kentucky H1N1 Influenza Site:  
<http://www.uky.edu/EM/swineflu.htm>

UK Chandler Medical Center Department of Infection Prevention and Control Main Page: <http://www.hosp.uky.edu/ipc/index.html>

World Health Organization (WHO) Pandemic 2009 H1N1 Main Page:  
<http://www.who.int/csr/disease/swineflu/en/index.html>