

Richard F. Daines, M.D.  
*Commissioner*James W. Clyne, Jr.  
*Executive Deputy Commissioner*

September 18, 2009

**To:** Healthcare Providers, Hospitals, Long Term Care Facilities, and Local Health Departments**From:** NYSDOH Division of Epidemiology

**HEALTH ADVISORY:  
CLINICAL GUIDANCE FOR HEALTHCARE PROVIDERS  
FOR THE 2009-2010 INFLUENZA SEASON**

**Please distribute to staff in the Departments of Critical Care, Emergency Medicine, Family Practice, Infection Control, Infectious Disease, Internal Medicine, Laboratory Medicine, Pediatrics, Pulmonary Medicine, and inpatient and outpatient units.**

This advisory is intended for providers seeing patients outside of New York City. For guidance related to providers seeing patients in New York City, see the New York City Department of Health and Mental Hygiene (NYCDOHMH) Advisories at: [www.nyc.gov/health/nycmed](http://www.nyc.gov/health/nycmed).

The New York State Department of Health (NYSDOH) is providing the following clinical guidance regarding the upcoming influenza season and the ongoing pandemic of novel influenza A (H1N1) virus (referred to as novel H1N1 influenza). This advisory updates earlier clinical guidance issued in response to the spring 2009 novel H1N1 influenza outbreak. The guidance in this advisory is based on currently available information from the Centers for Disease Control and Prevention (CDC), Infectious Diseases Society of America, American Academy of Pediatrics and other sources, and will likely change as additional information becomes available. The focus of this advisory is clinical guidance for healthcare providers; please see the NYSDOH website at <http://www.nyhealth.gov> for more detailed information on issues such as influenza surveillance and reporting, vaccination, infection control, and community control measures.

The **key points** in this advisory include:

- Providers should review regional and state influenza virus surveillance data weekly during the influenza season to determine which types (influenza A or B) and subtypes of influenza A virus (novel H1N1, seasonal H1N1, or seasonal H3N2) are currently circulating in the area. This information will help guide clinical management decisions, including the appropriate choice of antiviral medication(s) for empiric therapy. Current information on influenza surveillance data in New York State is available on the NYSDOH web site at: [http://www.health.state.ny.us/diseases/communicable/influenza/h1n1/health\\_care\\_providers/](http://www.health.state.ny.us/diseases/communicable/influenza/h1n1/health_care_providers/)
- Providers should initiate early, empiric antiviral treatment for hospitalized patients with suspected seasonal influenza or novel H1N1 influenza, and outpatients with influenza-like illness (ILI) who are at high risk for complications from influenza, including pregnant women.
- Persons who are not at higher risk for complications or do not have severe influenza requiring hospitalization generally do not require antiviral medications for treatment or prophylaxis.

- Rapid influenza diagnostic tests (RIDTs), also referred to as rapid antigen tests, have low to moderate sensitivity for both seasonal and novel influenza compared to viral culture or reverse transcription polymerase chain reaction (RT-PCR) testing. Thus, a negative rapid test result does not rule out influenza virus infection. If clinical suspicion of influenza is high in a patient who tests negative by RIDT (or if RIDT is not offered), empiric antiviral therapy should be administered, if appropriate.
- Healthcare providers should advise people with mild influenza symptoms **not** to go to the emergency department. Office visits may not be necessary for patients with mild illness. These patients or their parents can be screened by phone, prescribed antiviral medications (if indicated), given symptomatic treatment recommendations, and instructed to contact their healthcare provider if more serious symptoms develop.
- Post-exposure chemoprophylaxis can be considered for persons who are at high risk for influenza complications and who had close contact with a person with influenza. As an alternative to chemoprophylaxis, healthcare providers may choose to counsel exposed people at higher risk of influenza complications about the signs and symptoms of influenza and advise them to immediately contact their healthcare provider if signs or symptoms develop.
- All medical facilities and offices should strictly adhere to infection control recommendations for influenza.
- Patients, especially those who are at high risk for influenza complications, should be vaccinated with seasonal influenza vaccine as soon as possible.
- Patients should be vaccinated with novel H1N1 vaccine according to the priority groups and recommendations established by the CDC's Advisory Committee on Immunization Practices (ACIP).
- Patients who have existing indications for pneumococcal vaccination should be vaccinated according to current ACIP recommendations.

The **major changes** from previous advisories on novel H1N1 influenza include:

- An increased emphasis on the need for providers to be aware of regional and state influenza surveillance data which will impact clinical management decisions.
- Revised physician reporting criteria that focus on patient deaths suspected to be related to influenza. (See Section 4 for the specific reporting criteria.)
- The availability of commercial laboratory testing for novel H1N1 influenza. Thus, the NYSDOH Wadsworth Center will no longer offer clinical diagnostic testing for novel H1N1 influenza for individual hospitalized patients.
- Additional information about rapid influenza diagnostic tests and their low sensitivity in detecting novel H1N1 and seasonal influenza viruses.
- Additional guidance for healthcare providers about promoting early treatment of influenza, including possible strategies to reduce the amount of time between illness onset in high-risk patients and treatment (e.g., educating high-risk patients about the importance of early treatment; ensuring rapid access to telephone consultation and clinical evaluation).
- An alternative to chemoprophylaxis has been added. Healthcare providers may choose to counsel exposed people at higher risk of influenza complications about the signs and symptoms of influenza and advise them to immediately contact their healthcare provider if signs or symptoms develop.
- Inclusion of information on the antiviral drug sensitivities of influenza strains expected to circulate during the 2009-2010 influenza season, and recommendations for the selection of antiviral treatment and prophylaxis using influenza surveillance data.
- Change in the recommendation for how long a person with ILI should remain at home. Ill persons should remain home until at least 24 hours after they are free of fever (100° F [37.8°C]), or signs of a fever without the use of fever-reducing medications. (This is a change from the previous recommendation that ill persons stay home for 7 days after illness onset or until 24 hours after the resolution of symptoms, whichever was longer.)

The recommendations in this advisory are consistent with CDC guidance with the following exceptions:

- The NYSDOH and CDC both recommend that healthcare personnel performing aerosol-generating procedures on patients with an acute febrile respiratory illness should wear a fit-tested N-95 respirator and eye protection. For all other times when in close contact with a patient with suspected or confirmed novel H1N1 influenza, the NYSDOH recommends healthcare personnel follow Droplet precautions by wearing a surgical facemask, while the CDC recommends that healthcare personnel wear a fit-tested N-95 respirator.
- The NYSDOH recommends that healthcare personnel with febrile respiratory illness, including confirmed or suspected novel H1N1 infection, should not return to work until symptomatic improvement and at least 24 hours after fever resolves off antipyretic medications. In contrast, the CDC recommends that healthcare personnel with confirmed or suspected novel H1N1 infection be excluded from work for 7 days from symptom onset or until the resolution of symptoms, whichever is longer.

## Table of Contents

Section	Topic	Page
1.	Background	3
2.	Persons at High Risk for Complications from Influenza	4
3.	Clinical Assessment	5
4.	Reporting Criteria	5
5.	Types of Influenza Diagnostic Tests	6
6.	Influenza Diagnostic Testing in Patients with Suspected Influenza	7
7.	Patients with Mild Illness	7
8.	Antiviral Treatment for Influenza	8
9.	Antiviral Chemoprophylaxis for Influenza	9
10.	Other Treatment and Prophylaxis Issues	10
11.	Infection Control Recommendations	11
12.	Influenza and Pneumococcal Vaccination	13
13.	Additional Information	14
Appx 1	Influenza Antiviral Medication Dosing Recommendations	15
Appx 2	Antiviral Drug Sensitivities of Influenza Strains Expected to Circulate During the 2009-2010 Influenza Season	17
Appx 3	Interim Recommendations for the Selection of Antiviral Medications Using Viral Surveillance Data	18
Appx 4	Testing, Treatment, and Prophylaxis Decision Algorithm for Patients with Influenza-Like Illness (ILI) in New York State	19

### 1. Background

In April 2009, human cases of novel H1N1 influenza infection were first identified. This influenza A virus had not been seen in people before and human-to-human transmission continued throughout the summer months. In June 2009, the World Health Organization (WHO) raised the worldwide pandemic alert level to Phase 6 which indicated that a global pandemic was underway. It is not known at this time how severe the novel H1N1 influenza pandemic will be in terms of how many people infected will develop serious complications from infection. However, because novel H1N1 influenza is a new virus, many people may have little or no immunity against it, and illness may be more severe and/or widespread.

The CDC and NYSDOH have discontinued reporting of individual case counts. National and state surveillance efforts for novel H1N1 influenza are currently focused on severely ill patients and fatalities.

In July and August 2009, influenza activity decreased in New York State compared to previous months; however, there were still higher levels of influenza than normal for this time of year. The majority of the influenza viruses recently subtyped at the NYSDOH Wadsworth Center have been novel H1N1 influenza viruses, with much lower levels of seasonal influenza viruses detected.

## **2. Persons at High Risk for Complications from Influenza**

It is not known at this time how severe novel H1N1 influenza will be in the general population as the pandemic evolves. Severe disease and death caused by novel H1N1 infection thus far have affected younger adults, children, pregnant women, and persons of all ages with certain underlying medical conditions more than the elderly.

Current evidence suggests that population immunity to this virus is low, particularly among the young. Widespread susceptibility to this virus among young persons creates the potential for large numbers of cases with more hospitalizations and deaths among younger age groups than would be expected for a typical routine seasonal influenza virus.

Until further information is available, the same groups at increased risk of seasonal influenza-related complications are considered to be at increased risk for novel H1N1-related complications and include the following:

- Children <5 years. (However, the risk for severe complications from seasonal influenza is highest among children younger than 2 years old.)
- Persons with the following underlying medical conditions:
  - Chronic pulmonary disease, including asthma;
  - Chronic cardiovascular (except isolated hypertension), renal, or hepatic disease;
  - Hematological disorders, including sickle cell disease;
  - Metabolic disorders, including diabetes;
  - Neurologic or neuromuscular disorders that increase the risk for aspiration or compromise the handling of respiratory secretions; or
  - Immunocompromising conditions, including HIV infection, leukemia, lymphoma, Hodgkin's disease, multiple myeloma, generalized malignancy, chronic renal failure, nephrotic syndrome; those receiving immunosuppressive chemotherapy (including corticosteroids); those who have received an organ or bone marrow transplant; and those who have central nervous system fluid leaks.
- Persons <19 years who are receiving long-term aspirin therapy for diseases such as rheumatoid arthritis or Kawasaki disease.
- Pregnant women.
- Residents of nursing homes and other chronic-care facilities.
- Adults ≥65 years. (Note: while elderly persons have had overall lower rates of illness with novel H1N1 virus than normally seen during seasonal influenza epidemics, their risk of hospitalizations and death if they become infected is elevated.)

Preliminary studies suggest that people who are morbidly obese (body mass index equal to or greater than 40) and perhaps people who are obese (body mass index 30 to 39) may be at increased risk of hospitalization and death due to novel H1N1 influenza infection. Additional studies to determine the risk of obesity for these complications of novel H1N1 virus infection are underway.

### 3. Clinical Assessment

It is not possible to distinguish between seasonal influenza infection, novel H1N1 influenza infection, and infections with other respiratory viruses based solely on a patient's clinical presentation. Depending on the clinical test used, influenza testing may not be sensitive or timely enough to assist with initial patient management decisions. There is also the added challenge of differing antiviral resistance patterns of influenza strains, which impacts the choice of antiviral treatment. Thus, providers will need to consider several factors when making initial patient management decisions, including:

- current levels of both seasonal influenza and novel H1N1 influenza activity in the community;
- results of any rapid influenza diagnostic testing, if performed;
- severity of the patient's illness; and
- presence of any underlying medical conditions that places the patient at higher risk for complications from influenza.

In general, providers should initiate early, empiric antiviral treatment for:

- all hospitalized patients with suspected seasonal influenza or novel H1N1 influenza, and
- outpatients with ILI who are at high risk for complications from influenza (as listed in Section 2).

The choice of antiviral medication(s) will depend on the current levels of influenza activity and the results of any rapid influenza diagnostic testing, if performed. See Section 8 and Appendices 1, 2, and 3 on antiviral treatment for further details. See Appendix 4 for a summary algorithm on testing, treatment, and prophylaxis for patients with ILI in New York State.

#### *Clinical Presentation*

Clinicians should consider novel H1N1 influenza or seasonal influenza infection in the differential diagnosis of any person presenting with an unexplained acute febrile respiratory illness, including:

- ILI (defined as a measured temperature  $\geq 37.8^{\circ}\text{C}$  [ $100^{\circ}\text{F}$ ] with cough or sore throat);
- pneumonia and fever;
- acute respiratory distress syndrome (ARDS) and fever; or
- respiratory distress and fever.

Patients with novel H1N1 influenza infection are likely to present with symptoms similar to typical, seasonal ILI. In addition to fever, cough, and sore throat, patients with confirmed uncomplicated novel H1N1 influenza infection have reported chills, headache, rhinorrhea, shortness of breath, myalgias, fatigue, nausea, abdominal pain, and diarrhea.

Providers should keep in mind that, as with seasonal influenza, infants, elderly adults, and persons with compromised immune systems may have atypical presentations, such as presenting without a fever, sepsis-like syndrome, or an unexplained exacerbation of a chronic lung or heart condition.

### 4. Reporting Criteria

#### *Community Case Reporting*

Physician reporting will be focused on patient deaths suspected to be related to influenza. All physicians should report immediately by telephone to the local health department (LHD) any patient deaths meeting the following reporting criteria:

- Deaths among adult and pediatric patients involving an unexplained acute respiratory febrile illness.
- Deaths among adult and pediatric patients suspected or confirmed to have novel H1N1 influenza.
- Deaths among pediatric patients suspected or confirmed to be related to any type of influenza (novel or seasonal).

For all pediatric deaths, the LHD will coordinate with the coroner or medical examiner to facilitate appropriate follow-up, including an autopsy examination and submission of specimens for testing at the

NYSDOH Wadsworth Center and/or CDC. The LHD may also request clinical information about the deceased patient for completion of a case report for submission to the NYSDOH. While autopsies may be requested, consent is generally required.

For adult deaths, there is no longer a need to conduct routine autopsies for influenza surveillance. The LHD may request clinical information about the deceased patient for completion of a case report for submission to the NYSDOH. Autopsy can be considered if the case presented with unusual disease processes (based on clinical judgment) prior to death. If an autopsy is done and reveals unusual pathologic findings, submission of specimens for further testing at the NYSDOH Wadsworth Center will be considered on a case-by-case basis.

Providers should also continue to report patients with milder ILI who are part of a community outbreak (especially patients who are from congregate facilities such as group homes and day care settings). A community outbreak is generally defined as a cluster of illness above baseline among epidemiologically linked cases. The LHD will determine if an investigation or further follow-up is indicated. If there are difficulties reaching the LHD, the provider should contact the NYSDOH. During business hours, call 518-473-4439; after hours, call 1-866-881-2809.

#### ***Healthcare Facility Outbreak Reporting***

In addition to the reporting criteria above, NYSDOH-regulated healthcare facilities must report to the NYSDOH any instance of nosocomial transmission of influenza, including:

- A single nosocomial case of confirmed influenza in a facility patient/resident or staff member
- Clusters of ILI among healthcare workers and patients/residents of a facility (defined as two or more cases on the same unit within 7 days)

Reports should be submitted via the Nosocomial Outbreak Reporting Application (NORA) system located on the Health Provider Network (HPN) at <https://commerce.health.state.ny.us/hpn/infecontrol/forms.html>. The appropriate NYSDOH Regional Epidemiology office or NYCDOHMH office will follow up with the facility making the report.

For questions regarding nosocomial reporting, please contact the appropriate NYSDOH Regional Epidemiology office as listed on the following website: [http://www.health.state.ny.us/professionals/diseases/reporting/communicable/infection/regional\\_epi\\_staff.htm](http://www.health.state.ny.us/professionals/diseases/reporting/communicable/infection/regional_epi_staff.htm) or the NYCDOHMH Influenza Surveillance Coordinator at (212) 442-9050 or (212) 788-4150. To reach the NYSDOH after hours, call 1-866-881-2809.

#### **5. Types of Influenza Diagnostic Tests**

There are several types of laboratory diagnostic tests that can be used for detecting the presence of influenza viruses in respiratory specimens, including rapid influenza diagnostic tests, immunofluorescence, RT-PCR, and viral culture. These tests differ in their sensitivity and specificity in detecting influenza viruses, the amount of time needed from specimen collection until results are available, and the tests' ability to distinguish between different influenza virus types and subtypes.

#### ***Rapid Influenza Diagnostic Tests (RIDTs)***

RIDTs detect influenza viral nucleoprotein antigen. Commercially available RIDTs can either: 1) detect and distinguish between influenza A and B viruses; 2) detect both influenza A and B viruses but not distinguish between influenza A and B viruses; or 3) detect only influenza A viruses. None of the currently FDA-approved RIDTs can distinguish between influenza A subtypes (for example, distinguish between the novel influenza A virus and seasonal influenza A viruses). Also, RIDTs cannot provide any information about antiviral drug susceptibility.

Because RIDTs can provide results within 30 minutes or less, they may provide some timely information to help guide initial clinical decisions regarding the management of patients with an acute febrile respiratory illness. However, RIDTs have low to moderate sensitivity for both seasonal and novel influenza compared to viral culture or RT-PCR. Thus, a negative rapid test result does not rule out influenza virus infection. Since false negative results can occur, if clinical suspicion of influenza is high in a patient who tests negative by RIDT (or if RIDT is not offered), early, empiric antiviral therapy should be administered, if appropriate. (See section 8 on antiviral treatment for further details.)

### ***Other Influenza Diagnostic Tests***

RT-PCR, immunofluorescence [DFA or IFA], and viral culture testing are more sensitive than RIDTs but results are usually not immediately available to guide initial clinical decisions. These tests may be helpful if the results will influence clinical management such as antiviral treatment decisions, other diagnostic testing (e.g., testing for RSV), and antibiotic treatment decisions.

### ***Novel H1N1 Influenza Confirmatory Tests***

Most widely available commercial and hospital influenza testing will not be able to confirm novel H1N1 influenza. However, testing to confirm novel H1N1 influenza by PCR is now available at some commercial and hospital laboratories that have been approved by the NYSDOH's Clinical Laboratory Evaluation Program (CLEP).

Public health laboratory testing for novel H1N1 influenza will focus primarily on meeting surveillance needs and will not be routinely available to providers or facilities for primary testing. The NYSDOH Wadsworth Center will no longer offer clinical diagnostic testing for novel H1N1 influenza for individual hospitalized patients.

## **6. Influenza Diagnostic Testing in Patients with Suspected Influenza**

*Patients hospitalized with an acute febrile respiratory illness:* Providers may consider laboratory testing for influenza by commercially available tests (rapid influenza diagnostic tests; immunofluorescence [DFA or IFA]; RT-PCR; or culture) if it will provide useful information that impacts the care of these patients. Providers should take into consideration the limitations of the diagnostic test used. Antiviral treatment should not wait for laboratory confirmation of influenza.

*High-risk patients with milder influenza illness in the outpatient setting:* Providers may also consider commercially available influenza testing for high-risk patients in the outpatient setting who have milder ILI symptoms if it will provide useful information that impacts the care of these patients. Providers should take into consideration the limitations of the diagnostic test used. Antiviral treatment should not wait for laboratory confirmation of influenza.

*Patients with mild illness and **not** at high risk for complications from influenza:* For these patients, influenza testing is usually not indicated because testing will not influence treatment decisions.

## **7. Patients with Mild Illness**

Healthcare providers should advise people with mild influenza symptoms **not** to go to the emergency department. Patients with mild illness may not need to be seen in the office. These patients can be screened by phone, prescribed antiviral medications (if indicated – e.g., if the patient is at high risk for influenza complications), given symptomatic treatment recommendations, and instructed to contact their healthcare provider if more serious symptoms develop.

Patients with mild illness should be provided with educational information about preventing influenza transmission and advised to stay home until at least 24 hours after they are free of fever (100° F

[37.8°C]), or signs of a fever without the use of fever-reducing medications. Guidance for taking care of a sick person in the home can be found at: [http://www.cdc.gov/h1n1flu/guidance\\_homecare.htm](http://www.cdc.gov/h1n1flu/guidance_homecare.htm).

## **8. Antiviral Treatment for Influenza**

Antiviral treatment is *recommended* for the following patients:

- Patients hospitalized with confirmed or suspected influenza.
- Patients with milder presentations of influenza infection AND who are at high risk for influenza complications. (See Section 2 for a list of high-risk conditions.) In particular, providers should keep in mind that pregnant women and persons with asthma are at high risk for complications due to influenza and should receive early antiviral treatment.

Obese patients often have underlying conditions that put them at increased risk for complications due to novel H1N1 influenza infection, such as diabetes, asthma, chronic respiratory illness, or liver disease. Patients with confirmed or suspected influenza and who are obese should be carefully evaluated for the presence of underlying medical conditions that are known to increase the risk for influenza complications, and receive empiric treatment when these conditions are present.

Antiviral treatment should be initiated as soon as possible (ideally within 48 hours) after the onset of symptoms. For patients with severe disease and/or who are at high risk for complications, treatment can be initiated at any point, but is most effective earlier in the course of illness. Recommended duration of treatment is 5 days. Hospitalized patients with severe infection may require longer treatment courses.

Clinical judgment is an important factor in treatment decisions. Persons with suspected influenza infection who present with an uncomplicated febrile illness typically do not require treatment unless they are at higher risk for influenza complications. For most patients without any underlying medical conditions, the benefits of using antiviral medications may be modest. However, any suspected influenza patient who presents with emergency warning signs (e.g., difficulty breathing or shortness of breath) or signs of lower respiratory tract illness should promptly receive antiviral therapy.

### ***Strategies to Promote Early Treatment***

Providers should implement strategies to promote the early treatment of influenza among their high-risk patients. Strategies include: educating patients at higher risk for influenza complications about the signs and symptoms of influenza and the need for early treatment after symptom onset; ensuring rapid access to telephone consultation and clinical evaluation for these patients as well as patients who report severe illness; and considering empiric treatment of patients at higher risk for influenza complications based on telephone contact. Providers may also consider giving a prescription for an influenza antiviral to selected high-risk patients for future use along with appropriate education about signs and symptoms of influenza and instructions to fill the prescription if and when symptoms develop. Providers may prefer to provide a prescription that requires a phone consultation with the provider before it can be filled.

Patients should be educated about their continued susceptibility to influenza virus infection after treatment is completed (because of other circulating influenza viruses or if illness was due to another cause), and the need to again seek early access to health care consultation if symptoms recur.

### ***Choice of Antiviral Medication for Treatment***

Health care providers will need to make decisions about which antiviral medication to use for treatment by taking into consideration the influenza activity in New York State and the antiviral susceptibility patterns of the circulating strains. Evidence from other states and the southern hemisphere suggests that novel H1N1 influenza virus will remain the dominant influenza strain this season. However, healthcare providers should review weekly their regional and state influenza virus surveillance data to determine

which types (influenza A or B) and subtypes of influenza A virus (novel H1N1, seasonal H1N1, or seasonal H3N2) are currently circulating in the area. Current information on influenza surveillance data in New York State is available at:

[http://www.health.state.ny.us/diseases/communicable/influenza/h1n1/health\\_care\\_providers/](http://www.health.state.ny.us/diseases/communicable/influenza/h1n1/health_care_providers/)

The following recommendations are based on antiviral susceptibility patterns current as of September 2009. (See Appendix 2 for antiviral drug sensitivities of influenza strains that may circulate during the 2009-2010 influenza season.)

- Oseltamivir or zanamivir should be used to treat individuals with novel influenza A (H1N1), influenza A (H3N2), or influenza B. For the treatment of pregnant women, oseltamivir is preferred due to its systemic activity.
- Zanamivir should be used to treat individuals with seasonal influenza A (H1N1).
  - Rimantadine can be used for patients who cannot receive zanamivir (e.g., patient is <7 years old, has chronic underlying pulmonary disease, or cannot use the zanamivir inhalation device) or if zanamivir is unavailable.
  - Amantadine can be substituted for rimantadine if rimantadine is unavailable.
- Zanamivir or a combination of oseltamivir and rimantadine should be used if:
  - The patient's subtype information is not available **and** multiple influenza strains are circulating including seasonal influenza A (H1N1), or
  - Influenza surveillance information is not available or unknown.
  - Use of zanamivir or combination therapy with oseltamivir and rimantadine will provide effective treatment against all possible circulating influenza viruses.

See Appendix 3 for a summary table of recommendations for the selection of antiviral medications based on influenza surveillance data.

Note that zanamivir is not recommended for patients with underlying pulmonary disease, such as asthma or chronic obstructive pulmonary disease. See Appendix 1 for antiviral medication dosing recommendations. Some experts recommend the use of increased (doubled doses) of oseltamivir for some severely ill patients, although there are no published data on its effectiveness. Dosages of some antiviral medications may need to be adjusted for persons age 65 years and older, persons with impaired renal function, or persons with liver disease. Clinicians should consult the package insert of each antiviral medication for additional dosing information, contraindications/warnings/precautions, and adverse effects.

## **9. Antiviral Chemoprophylaxis for Influenza**

Post-exposure prophylaxis can be considered for persons who are at high risk for influenza complications and who had close contact with a person with influenza during the ill person's infectious period (defined as 1 day prior to onset of symptoms until 24 hours after fever ends). (See Section 2 for a list of high-risk conditions.) When chemoprophylaxis is indicated, antiviral medication should be initiated as soon as possible following the exposure and should continue for 10 days following the last known exposure to influenza. Chemoprophylaxis generally is not recommended if more than 48 hours have elapsed since the last contact with an infectious person.

As an alternative to chemoprophylaxis, healthcare providers may choose to counsel exposed people at higher risk of influenza complications about the signs and symptoms of influenza and advise them to immediately contact their healthcare provider if signs or symptoms develop. Healthcare providers should use clinical judgment regarding situations where early recognition of illness and treatment might be an appropriate alternative. Providers may choose to give the exposed patient a prescription for an influenza antiviral and may want to request that the patient contact the provider if signs or symptoms of influenza develop, obtain antiviral medications as quickly as possible, and start treatment.

### ***Choice of Antiviral Medication for Chemoprophylaxis***

Persons who are candidates for post-exposure chemoprophylaxis should be provided with medications most likely to be effective against the influenza virus that is the cause of the close contact's illness, if known. Healthcare providers should also be aware of state influenza activity and antiviral susceptibility patterns of the circulating strains. Evidence from other states and the southern hemisphere suggests that novel H1N1 influenza virus will remain the dominant influenza strain this season.

The following recommendations are based on antiviral susceptibility patterns current as of September 2009. (See Appendix 2 for antiviral drug sensitivities of influenza strains that may circulate during the 2009-2010 influenza season.)

- Oseltamivir or zanamivir should be used for exposure to a person with novel influenza A (H1N1), influenza A (H3N2) or influenza B.
- Zanamivir should be used for exposure to a person with seasonal influenza A (H1N1).
  - Rimantadine can be for patients who cannot receive zanamivir (e.g., patient is <7 years old, has chronic underlying airways disease, or cannot use the zanamivir inhalation device) or if zanamivir is unavailable.
  - Amantadine can be substituted for rimantadine if rimantadine is unavailable.
- Zanamivir or a combination of oseltamivir and rimantadine should be used if:
  - subtype information is not available **and** multiple influenza strains are circulating, including seasonal influenza A (H1N1), or
  - influenza surveillance information is not available or unknown.
  - Use of zanamivir or combination therapy with oseltamivir and rimantadine will provide effective prophylaxis against all possible circulating influenza viruses.

See Appendix 3 for a summary table of recommendations for the selection of antiviral medications based on influenza surveillance data.

Note that zanamivir is not recommended for patients with underlying pulmonary disease, such as asthma or chronic obstructive pulmonary disease. See Appendix 1 for antiviral medication dosing recommendations; dosages of some antiviral medications may need to be adjusted for persons age 65 years and older, persons with impaired renal function, or persons with liver disease. Clinicians should also consult the package insert of each antiviral medication for additional dosing information, contraindications/warnings/precautions, and adverse effects.

## **10. Other Treatment and Prophylaxis Issues**

### ***Oseltamivir-Resistant Novel H1N1 Influenza***

To date, there have been sporadic reports of persons with oseltamivir-resistant novel H1N1 influenza virus infection. These reports have typically occurred among persons who developed illness while receiving oseltamivir for chemoprophylaxis or immunocompromised patients with influenza who were being treated. Since these reports are rare, the CDC's interim recommendations for the treatment and chemoprophylaxis of novel H1N1 influenza have not changed and oseltamivir continues to be an option. Inappropriate use of oseltamivir for chemoprophylaxis could contribute to the increased development of oseltamivir resistance among novel H1N1 influenza viruses. Antiviral agents for chemoprophylaxis should be used judiciously; chemoprophylaxis should be reserved for persons at high risk for influenza complications who have been exposed to a person with influenza.

### ***Antiviral Medications and Live Attenuated Influenza Vaccine***

Antiviral medications may interfere with a person's immune response to the live attenuated influenza vaccine (LAIV). If a person is taking an influenza antiviral medication, LAIV should not be given until 48 hours after the last dose of the influenza antiviral medication. If a person has received LAIV, influenza antiviral medication taken within 2 weeks after receipt of LAIV may interfere with the person's

response to the vaccine. Trivalent inactivated influenza vaccine can be administered at any time relative to use of an antiviral medication.

### ***Personal Stockpiles of Antiviral Medications***

The NYSDOH strongly discourages physicians and other healthcare providers from prescribing antiviral medications for well patients who are not at high risk for influenza complications to stockpile now for possible future use. Repeated dosing of antivirals in the absence of medical indications is not advised for the following reasons:

- Inappropriate or inconsistent use of antivirals may increase the risk of drug resistance.
- Susceptibility of the prescribed antiviral for a future circulating strain is unknown.
- Use of antivirals without the guidance of a physician may increase the risk of adverse effects or drug interactions.

### ***Bacterial Co-Infection***

Influenza-related complications for both seasonal and novel H1N1 influenza include possible bacterial co-infection and pneumonia. Bacterial etiologic agents have included *Streptococcus pneumoniae*, methicillin-resistant *Staphylococcus aureus* (MRSA), methicillin-sensitive *Staphylococcus aureus* (MSSA), Group A *Streptococcus*, and *Haemophilus influenzae*. Providers should consider the possibility of bacterial co-infection in their patients and evaluate for the potential need for antibiotics.

### ***Fevers in Pregnant Women***

Fever in pregnant women should be promptly treated with acetaminophen because maternal hyperthermia has been associated with various adverse fetal and neonatal outcomes.

## **11. Infection Control Recommendations**

Current evidence suggests that novel H1N1 influenza is comparable to seasonal influenza in its spectrum of illness and transmission pattern. Therefore, NYSDOH continues to recommend that infection control measures for novel H1N1 influenza be similar to those taken for seasonal influenza, with exceptions noted below. NYSDOH guidance in healthcare settings differs from current CDC guidance. However, NYSDOH guidance is consistent with the most current scientific evidence available and is consistent with that distributed by the NYCDOHMH and other state health departments.

These infection control recommendations apply to ALL patients with influenza, including confirmed or suspected novel H1N1 influenza, or with febrile respiratory illness. Efforts to maximize adherence to recommendations for seasonal influenza, including meticulous respiratory hygiene and cough etiquette, should be practiced in all medical facilities.

### ***Telephone Triage***

- Schedule patients with acute febrile respiratory illness toward the end of the day to avoid exposure to other patients.
- Instruct symptomatic patients to notify staff upon arrival.

### ***Reception and Waiting Area***

- Immediately upon arrival, ill patients should be given a surgical mask and instructed to perform hand hygiene and observe proper cough etiquette to minimize risk of exposure to other patients.
- Ask symptomatic patients to wear a surgical face mask while waiting and while being examined and cared for, including if transferred to another area of the clinic.
- Provisions should be made for symptomatic patients who cannot tolerate wearing a surgical mask, i.e. place patient in a room immediately.

- If a patient cannot be assigned to a room immediately, designate a separate waiting area and/or a place where they can sit at least six feet from others.
- Assure masks, tissues, no-touch trash containers and alcohol hand rub products are easily available for staff and patient use.
- Post visual alerts for proper prevention measures and hygiene in appropriate languages. Examples are available at: [http://www.nyhealth.gov/diseases/communicable/influenza/h1n1/educational\\_materials.htm](http://www.nyhealth.gov/diseases/communicable/influenza/h1n1/educational_materials.htm).
- Enhance environmental cleaning of high-touch surfaces in waiting areas.

#### ***Transmission-Based Precautions***

- Staff members who have close contact (including examining, collecting specimens, or providing direct medical care) with any patient with acute febrile respiratory illness should follow Standard plus Droplet precautions.
- At a minimum, those staff should follow Droplet precautions by wearing a surgical facemask and gloves; the facemask should be put on before entering the room.
- If soiling of staff clothing or spray of patient secretions is anticipated, staff should wear a gown and eye protection (e.g., face shield or goggles), as indicated.
- If a nasopharyngeal swab or other respiratory specimen is being collected, the patient should be instructed to remove the facemask briefly for specimen collection, then replace the mask as soon as the specimen is obtained.
- When removing personal protective equipment (PPE), gloves should be removed before the surgical facemask followed by hand hygiene.
- Meticulous hand hygiene should be performed before and after removal of PPE and before and after patient care.

#### ***Aerosol-Generating Procedures***

- Aerosol-generating procedures include nebulizer treatments, bronchoscopy, intubation, extubation, and open tracheal suctioning performed on patients with acute febrile respiratory illness.
- Fit-tested N-95 respirators and eye protection (goggles or face shields) should be worn by healthcare personnel performing these procedures on patients with acute febrile respiratory illness.
- These procedures should be performed, when feasible, in an airborne infection isolation room (AIIR). An AIIR has negative directional air flow, a minimum of 6-12 air exchanges per hour and direct exhaust to the outside.
- If a negative air pressure room is not available, these procedures should be provided in a private room with closed door if at all possible, or if a private room is not available, kept a minimum of 6 feet from and use curtains or other barrier between another patient.

#### ***Environmental Cleaning and Disinfection***

- Routine cleaning and disinfection strategies used during influenza season can be applied to the environmental management of novel H1N1 influenza, including laundry, utensils, and medical waste.
- High touch surfaces and items (doorknobs, elevator buttons, restrooms, chairs, etc.) should be regularly cleaned and disinfected with appropriate agents.
- More information can be found at: [http://www.cdc.gov/ncidod/dhqp/gl\\_environmentinfection.html](http://www.cdc.gov/ncidod/dhqp/gl_environmentinfection.html).

#### ***Management of Ill Staff***

- All staff should be instructed NOT to work if they are ill.
- All staff should be aware of and follow their infection control and employee health policies which must be strictly enforced.
- If a staff member becomes ill while working, he or she should go home immediately.

- Staff with febrile respiratory illness should not return to work until symptomatic improvement and at least 24 hours after fever resolves off antipyretic medications.

## **12. Influenza and Pneumococcal Vaccination**

### ***Seasonal Influenza Vaccination***

Providers are strongly encouraged to vaccinate their patients with seasonal flu vaccine as soon as possible, especially those who are at high risk for influenza complications. The usual seasonal influenza viruses are still expected to cause illness this fall and winter; vaccinating patients with seasonal vaccine is not only an important prevention strategy, it may help reduce the overall burden on the health care system during the influenza season. Seasonal vaccine is available earlier than the novel H1N1 vaccine, and providers should begin seasonal vaccination efforts as soon as possible. Information on seasonal influenza vaccine can be found at: <http://www.cdc.gov/flu/professionals/acip/index.htm>

### ***Novel H1N1 Influenza Vaccination***

Novel H1N1 vaccine is expected to be available in October 2009; vaccine availability depends on several factors including manufacturing time and time needed to complete clinical trials.

CDC's ACIP has recommended that five priority groups receive the novel H1N1 vaccine when it first becomes available this fall. These groups include:

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

It is possible that initially the novel H1N1 vaccine will be available in limited quantities. If this occurs, it is recommended that the following groups receive the vaccine before others:

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

Once the demand for vaccine for all of the prioritized groups above have been met at the local level, programs and providers should begin vaccinating everyone from ages 25 through 64 years. Current studies indicate the risk for infection among persons age 65 years or older is less than the risk for younger age groups. Therefore, once vaccine supply and demand for vaccine among younger age groups has been met, programs and providers should offer vaccination to people over the age of 65 years.

Additional information about novel H1N1 vaccine, including how to obtain the vaccine, can be found on the NYSDOH web site at:

[http://www.health.state.ny.us/diseases/communicable/influenza/h1n1/health\\_care\\_providers/](http://www.health.state.ny.us/diseases/communicable/influenza/h1n1/health_care_providers/)

### ***Pneumococcal Vaccination***

During influenza outbreaks, pneumococcal vaccines may be useful in preventing secondary pneumococcal infections and reducing illness and death. Currently, two vaccines are available for prevention of pneumococcal disease, a 23-valent pneumococcal polysaccharide vaccine (PPSV23) and a 7-valent pneumococcal conjugate vaccine (PCV7).

CDC's ACIP recommends a single dose of PPSV23 for all people 65 years and older and for persons 2 to 64 years of age with certain high-risk conditions. A single revaccination at least five years after initial vaccination is recommended for: 1) people 65 years and older who were first vaccinated before age 65 years, and 2) people at highest risk, such as those who have no spleen, and those who have HIV infection, AIDS, or malignancy. Patients who have existing indications for PPSV23 should continue to be vaccinated according to current ACIP recommendations. PPSV23 may be administered on the same day as any of the influenza vaccines. Use of PPSV23 among people without current indications for vaccination is not recommended at this time.

PCV7 is recommended for all children up to 59 months of age. Healthcare providers should continue to vaccinate this population according to current ACIP recommendations. For more information about recommendations for use of pneumococcal vaccines, please see:

[http://www.cdc.gov/h1n1flu/guidance/pspv\\_h1n1.htm](http://www.cdc.gov/h1n1flu/guidance/pspv_h1n1.htm).

### **13. Additional Information**

The NYSDOH will provide updated guidance as information and recommendations become available. For additional information on this evolving situation, please refer to the following websites:

- New York State Department of Health: <http://www.nyhealth.gov>
- New York City Department of Health and Mental Hygiene: [www.nyc.gov/health/nycmed](http://www.nyc.gov/health/nycmed)
- Centers for Disease Control and Prevention: <http://www.cdc.gov/h1n1flu/>
- National Library of Medicine: <http://sis.nlm.nih.gov/enviro/swineflu.html>
- Infectious Diseases Society of America: <http://www.idsociety.org/Content.aspx?id=14220>
- World Health Organization: <http://www.who.int/en/>

### Influenza Antiviral Medication Dosing Recommendations

**Table 1: Antiviral medication dosing recommendations for adults and children 12 months of age and older**

(Table 1 adapted from Infectious Diseases Society of America guidelines for seasonal influenza)

Agent, group	Treatment (5 days)	Chemoprophylaxis (10 days)	
<b>Neuraminidase inhibitors</b>			
<b>Oseltamivir</b>			
Adults	75 mg capsule twice per day	75 mg capsule once per day	
Children (age 12 months or older) by weight	≤15 kg	60 mg per day divided into 2 doses	30 mg once per day
	15-23 kg	90 mg per day divided into 2 doses	45 mg once per day
	24-40 kg	120 mg per day divided into 2 doses	60 mg once per day
	>40 kg	150 mg per day divided into 2 doses	75 mg once per day
<b>Zanamivir</b>			
Adults	Two 5-mg inhalations (10 mg total) twice per day	Two 5-mg inhalations (10 mg total) once per day	
Children	Two 5-mg inhalations (10 mg total) twice per day (age, 7 years or older)	Two 5-mg inhalations (10 mg total) once per day (age, 5 years or older)	
<b>Adamantanes<sup>a</sup></b>			
<b>Rimantadine<sup>b</sup></b>			
Adults	200 mg per day, either as a single daily dose or divided into 2 doses	200 mg per day, either as a single daily dose or divided into 2 doses	
Children (age, 1-9 years)	6.6 mg/kg per day (maximum, 150 mg per day) divided into 2 doses	5 mg/kg per day once daily, not to exceed 150 mg	
Children (age, 10 years and older)	200 mg per day, either as a single daily dose or divided into 2 doses	200 mg per day, either as a single daily dose or divided into 2 doses	
<b>Amantadine</b>			
Adults	200 mg per day, either as a single daily dose or divided into 2 doses	200 mg per day, either as a single daily dose or divided into 2 doses	
Children (age, 1-9 years)	5-8 mg/kg per day divided into 2 doses or as a single daily dose (maximum, 150 mg per day)	5-8 mg/kg per day divided into 2 doses or as a single daily dose (maximum, 150 mg per day)	
Children (age, 10-12 years)	200 mg per day divided into 2 doses	200 mg per day divided into 2 doses	

<sup>a</sup> Adamantanes should be used only in situations where seasonal H1N1 influenza infection or exposure is suspected.

<sup>b</sup> Rimantadine has not been approved by the US Food and Drug Administration (FDA) for treatment of influenza of children, but published data exist on safety and efficacy in the pediatric population.

Clinicians should consult the package insert of each antiviral medication for specific dosing information, approved indications and ages, contraindications/warnings/precautions, and adverse effects.

**Table 2: Oseltamivir medication dosing recommendations for children less than 12 months of age\***

Agent, group		Treatment (5 days)	Chemoprophylaxis (10 days)
<b>Oseltamivir</b>			
Children (age <12 months)	<3 months	12 mg twice daily	Not recommended unless situation judged critical due to limited data on use in this age group
	3-5 months	20 mg twice daily	20 mg once daily
	6-11 months	25 mg twice daily	25 mg once daily

\* Oseltamivir use for children < 12 months old was approved in April 2009 by the U.S. Food and Drug Administration (FDA) under an Emergency Use Authorization (EUA) in response to the novel H1N1 influenza outbreak. Dosing for children <12 months is age-based. Healthcare providers should be aware of the lack of data on safety and dosing when considering oseltamivir use in young infants, and carefully monitor infants for adverse events when oseltamivir is used.

Source: <http://www.fda.gov/downloads/Drugs/DrugSafety/InformationbyDrugClass/UCM153546.pdf>

Note: Some experts prefer weight-based dosing for children aged younger than 1 year, particularly for very young or premature infants.

**Antiviral drug sensitivities of influenza strains expected to circulate during the 2009-2010 influenza season**

<b>Influenza Strain (2009-2010)</b>	<b>Amantadine (Symmetrel) Rimantadine (Flumadine)</b>	<b>Oseltamivir (Tamiflu)</b>	<b>Zanamivir (Relenza)</b>
Seasonal influenza A (H1N1) virus (A/Brisbane/59/2007)	Susceptible	Resistant	Susceptible
Novel influenza A (H1N1) virus	Resistant	Susceptible	Susceptible
Seasonal influenza A (H3N2) virus (A/Brisbane/10/2007)	Resistant	Susceptible	Susceptible
Seasonal influenza B (B/Brisbane 60/2008, Victoria lineage)	Not effective	Susceptible	Susceptible

Source: American Academy of Pediatrics Committee on Infectious Diseases:  
*Recommendations for Prevention and Control of Influenza in Children, 2009-2010*

**Interim recommendations for the selection of antiviral medications using viral surveillance data\***

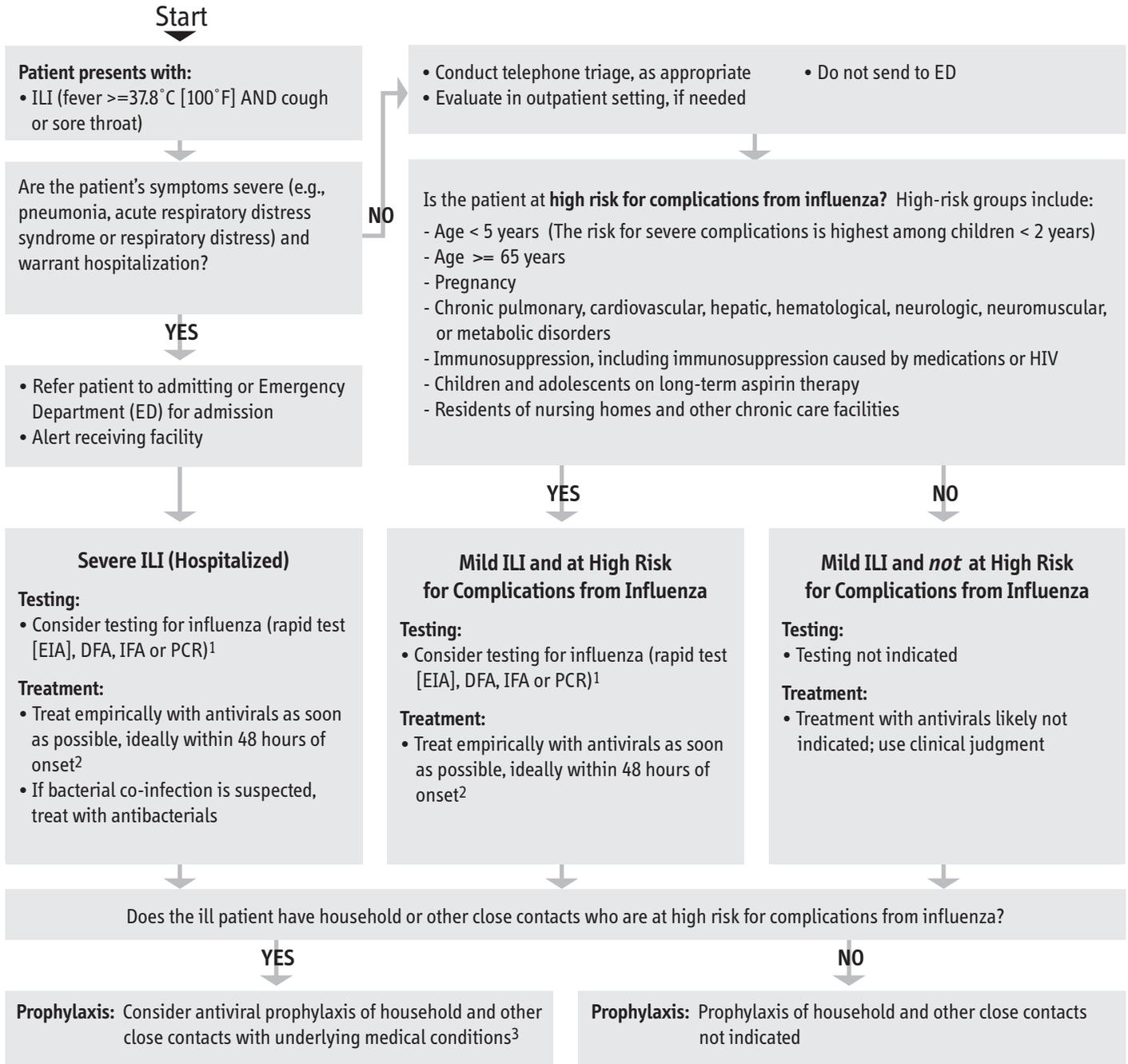
<b>Influenza virus(es) in the community</b>	<b>Preferred medication(s)</b>
Novel influenza A (H1N1) and/or Influenza A (H3N2) and/or Influenza B	Oseltamivir <b>or</b> Zanamivir
Seasonal influenza A (H1N1)	Zanamivir <b>or</b> Rimantadine**
Multiple influenza types/subtypes, <u>including seasonal H1N1</u> , are circulating or Surveillance data unknown or not available	Zanamivir <b>or</b> Combination oseltamivir and rimantadine**

\* If rapid influenza diagnostic testing is performed and is positive for influenza B, infection with influenza B virus is likely. Treatment with either oseltamivir or zanamivir is appropriate, regardless of other circulating strains in the community.

\*\*Amantadine can be substituted for rimantadine but has increased risk of adverse events.

Clinicians should consult the package insert of each antiviral medication for specific dosing information, approved indications and ages, contraindications/warnings/precautions, and adverse effects.

## Testing, Treatment and Prophylaxis Decision Algorithm for Patients with Influenza-Like Illness (ILI) in New York State



<sup>1</sup> Rapid tests have low to moderate sensitivity for both seasonal and novel influenza. Thus, a negative rapid test result does not rule out influenza virus infection. If clinical suspicion of influenza is high in a patient who tests negative by a rapid test (or testing is not offered), empiric antiviral therapy should be administered.

<sup>2</sup> Healthcare providers need to review regional and state influenza virus surveillance data weekly during the influenza season to determine which types (influenza A or B) and subtypes of influenza A virus (novel H1N1, seasonal H1N1 or seasonal H3N2) are currently circulating in the area. Influenza strains have differing antiviral resistance patterns. Thus, surveillance information will help guide clinical management decisions, including the choice of antiviral medication(s) for empiric therapy.

<sup>3</sup> An emphasis on early treatment is an alternative to chemoprophylaxis after a suspected exposure for some persons. Persons with risk factors for influenza complications who are household or close contacts of confirmed or suspected influenza cases can be counseled about the early signs and symptoms of influenza, and advised to immediately contact their healthcare provider for evaluation and possible early treatment if clinical signs or symptoms develop.