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Clinical Guidance for Assessment, Testing, and Treatment of
Novel Influenza A (H1N1) Virus in Pregnant Women
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Please note: This guidance 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.

Background

Since April 2009, the Centers for Disease Control and Prevention (CDC) has been working with the World Health Organization (WHO), state, city, and local officials to respond to the nationwide epidemic of human cases of H1N1 (swine flu) infection. It is not known at this time how severe novel influenza A (H1N1) will be in the general population. However, early indications are that pregnancy and other previously recognized medical conditions that increase the risk of seasonal influenza-related complications also appear to be associated with increased risk of complications from novel H1N1 virus infection. During seasonal influenza epidemics, pregnant women with underlying medical conditions such as asthma are at particularly high risk for influenza-related complications.

As of June 16, 2009, influenza continues to circulate in New York State (NYS) at levels that appear higher than normal for this time of year. The majority of the influenza viruses recently subtyped at the NYSDOH's Wadsworth Center have been novel influenza A (H1N1) viruses, with much lower levels of seasonal influenza viruses detected.

Clinical Assessment

In all clinical settings, including settings that provide care for pregnant women, patients should be screened for signs and symptoms of febrile respiratory illness at the initial point of contact, and these patients should be promptly segregated and assessed.

Pregnant women with novel influenza A (H1N1) infection are likely to present with symptoms of typical influenza-like illness (ILI is defined as a measured temperature ≥37.8°C [100°F] with cough or sore throat). In addition to fever, cough and sore throat, patients with confirmed uncomplicated novel influenza A (H1N1) infection have reported chills, headache, rhinorrhea, shortness of breath, myalgias, fatigue, and to a lesser extent, nausea, abdominal pain, and diarrhea.

It is expected that most pregnant patients will recover uneventfully from novel influenza A (H1N1) infection. However, for some pregnant women, illness may progress rapidly and may be complicated by pneumonia or acute respiratory distress syndrome [ARDS]. Preliminary data from the CDC have shown that most of the patients with novel influenza A (H1N1) infection and pneumonia have had findings consistent with viral pneumonia, rather than a secondary bacterial infection.

Clinicians should consider novel influenza A (H1N1) infection in the differential diagnosis of any pregnant woman presenting with an unexplained acute febrile respiratory illness (i.e., ILI; fever and: pneumonia, ARDS, or respiratory distress).

Influenza Laboratory Testing Recommendations

Laboratory testing for influenza by commercially available tests (rapid antigen testing [EIA], immunofluorescence [DFA or IFA], or PCR) is strongly recommended for pregnant women hospitalized with an acute febrile respiratory illness (ILI; fever and: pneumonia, ARDS, or respiratory distress). These hospitalized women should also be reported to the local health department (LHD) to assess the need for novel influenza A (H1N1) testing at a public health laboratory (see section below on novel influenza A (H1N1) confirmatory testing for further details). Providers may also consider commercially available influenza testing for pregnant women in the outpatient setting who have mild ILI symptoms.

Laboratory testing for influenza by commercially available tests may help inform decisions regarding the management of pregnant patients with an acute febrile respiratory illness. However, providers should be aware that the sensitivity of rapid testing is poor for both seasonal and novel influenza A (H1N1). Negative results do not rule out influenza in patients with compatible illness. However, a positive influenza A test at this time is likely to be novel H1N1 infection, although seasonal influenza A viruses continue to be identified. Immunofluorescence and PCR testing are more sensitive than rapid testing, but are usually only available through commercial diagnostic laboratories and thus results are often not immediately available.

Due to these laboratory testing limitations, providers should not rely on influenza test results and should initiate early, empiric antiviral treatment for all pregnant patients with confirmed, probable or suspected novel influenza A (H1N1) (see section below on antiviral treatment for further details).

Novel Influenza A (H1N1) Confirmatory Testing Criteria

Currently in NYS, only public health laboratories can perform the testing needed to **confirm** novel influenza A (H1N1). Testing for novel influenza A (H1N1) will only be conducted on specimens from patients who have been reported to the LHD and approved for testing in advance of specimen submission. Testing for novel influenza A (H1N1) is currently prioritized for hospitalized patients and patients who are part of an outbreak investigation.

The following obstetric patients should be reported to the LHD to determine whether testing for novel influenza A (H1N1) is indicated:

- All pregnant women hospitalized with an acute febrile respiratory illness (ILI; fever and: pneumonia, ARDS, or respiratory distress).
- Pregnant women with milder ILI who are part of a community outbreak (especially patients who are from congregate facilities such as group homes, day care settings, camps). A community outbreak is generally defined as a cluster of illness above baseline among epidemiologically linked cases.

Antiviral Treatment for Novel Influenza A (H1N1) Virus

Pregnant women with confirmed, probable, or suspected novel influenza A (H1N1) infection should receive early, empiric antiviral treatment for 5 days. Antiviral treatment should be initiated as soon as possible after the onset of influenza symptoms, ideally within 48 hours of onset. However, data from studies on seasonal influenza indicate benefit for hospitalized patients even if treatment is started more than 48 hours after onset.

Although zanamivir can be used in pregnancy, oseltamivir is preferred for the treatment of pregnant women because of its systemic absorption. Recommendations for antiviral dosing and duration of

treatment for pregnant women are the same as those recommended for adults who have seasonal influenza and are summarized in Table 1. Novel influenza A (H1N1) is not sensitive to amantadine or rimantadine, thus these drugs should not be prescribed. Antiviral chemoprophylaxis recommendations for seasonal influenza may differ and can be found at: http://www.cdc.gov/flu/professionals/antivirals/index.htm.

Oseltamivir and zanamivir are "Pregnancy Category C" medications, indicating that no clinical studies have been conducted to assess the safety of these medications for pregnant women. As no adverse effects have been reported among women who received oseltamivir or zanamivir during pregnancy or among infants born to women who have received oseltamivir or zanamivir, pregnancy should not be considered a contraindication to oseltamivir or zanamivir use. **Pregnant women appear to be at higher risk for severe complications from novel influenza A (H1N1), and the benefits of treatment or chemoprophylaxis with zanamivir or oseltamivir likely outweigh the theoretical risks of antiviral use.**

Treatment of Maternal Hyperthermia

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

Antiviral Chemoprophylaxis for Novel Influenza A (H1N1) Virus

A 10-day course of antiviral chemoprophylaxis should be considered for pregnant women who are close contacts of persons with suspected, probable or confirmed novel influenza A (H1N1) during the ill person's infectious period (from one day before to 7 days after illness onset).

The drug of choice for chemoprophylaxis during pregnancy is not clear; either oseltamivir or zanamivir may be used. Zanamivir may be preferable because of its limited systemic absorption. However, respiratory symptoms such as coughing or severe nasal congestion might limit zanamivir's usefulness because of its inhaled route of administration. Note that zanamivir is not recommended for patients with underlying pulmonary disease, such as asthma or chronic obstructive pulmonary disease. Antiviral chemoprophylaxis recommendations for seasonal influenza may differ and can be found at: http://www.cdc.gov/flu/professionals/antivirals/index.htm.

Table 1: Summary of novel influenza A (H1N1) virus antiviral medication dosing recommendations for adults

Agent	**Treatment (Duration: 5 days)**	**Post-exposure Chemoprophylaxis (Duration: 10 days)**
Oseltamivir	75 mg twice per day	75 mg once per day
Zanamivir	Two 5-mg inhalations (10 mg total) twice per day	Two 5-mg inhalations (10 mg total) once per day

Prevention

Keeping pregnant women free of novel influenza A (H1N1) is the preferred option and non-pharmacologic measures should be encouraged. These include avoiding close contact will ill people, careful hand washing, reducing unnecessary social contacts, and avoiding crowded settings whenever possible.

At this time, there is no available vaccine for novel influenza A (H1N1); however, vaccine will likely become available in fall 2009 and there will be further instructions regarding its use for pregnant women. Seasonal influenza immunization with trivalent inactivated vaccine (TIV) is strongly recommended for pregnant women during any trimester for the prevention of seasonal influenza and related complications.

In addition to vaccination benefitting pregnant women, some studies have shown the passive transfer of anti-influenza antibodies from vaccinated mothers to neonates. Live attenuated influenza vaccine (LAIV) is contraindicated for use in pregnant women, as it is a live virus vaccine.

Parents and caretakers should be instructed on how to protect their infant and other household members from the spread of germs that cause respiratory illnesses, including novel influenza A (H1N1):

- Wash household members' and infants' hands frequently with soap and water, including after having contact with respiratory secretions and contaminated objects/materials.
- Limit sharing of toys and other items that have been in infants' mouths. Wash thoroughly with soap and water any items that have been in infants' mouths.
- Keep pacifiers (including the pacifier ring/handle) and other items out of household members' or other infants' mouths prior to giving to the infant.
- Cover the nose and mouth when coughing or sneezing.
- Use tissues to contain respiratory secretions and dispose of them in the nearest waste receptacle after use.

Breastfeeding Considerations

In general, women should be encouraged to initiate breastfeeding early and feed frequently because infants who are not breastfed are particularly vulnerable to infections and hospitalization for severe respiratory illness. Ideally, babies should receive most of their nutrition from breast milk and efforts should be made to avoid unnecessary formula supplementation so the infant can receive as much maternal antibodies as possible. Infants who are ill with novel influenza A (H1N1) can and should continue breastfeeding as tolerated.

Women who are ill with novel influenza A (H1N1) can continue to breastfeed. Antiviral medication treatment or prophylaxis is not a contraindication for breastfeeding. If maternal illness prevents safe feeding at the breast, but the woman can still pump, she should be encouraged to do so. The risk for novel influenza A (H1N1) transmission through breast milk is unknown. However, reports of viremia with seasonal influenza infection are rare.

Ill mothers should take steps to reduce the risk of influenza transmission to their infant, such as conducting frequent hand washing and wearing a facemask, if available and tolerable, while breastfeeding. In addition, ill mothers should wear a facemask, when feasible, when in close contact with the infant and other household members. If a facemask is not available or tolerable, the ill mother should use a tissue to cover her nose and mouth when coughing or sneezing.

Additional Information

Vaccinating Women of Reproductive Age—Recommendations and Guidelines
http://www.health.state.ny.us/prevention/immunization/vaccinating_women_of_reproductive_age_guidelines.htm

Clinical Guidance for Assessment, Testing, and Treatment of Novel Influenza A (H1N1) Virus in Children
http://www.health.state.ny.us/diseases/communicable/influenza/h1n1/clinical_guidance_for_children.htm