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**DHEC Health Alert**

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**Anti-viral Treatment of Persons  
presenting with Influenza-like  
Illness**

This health advisory combines guidance issued for treatment of suspected or proven cases of swine influenza (A, H1N1), post-exposure prophylaxis for close contacts to confirmed or probable cases of swine influenza, and treatment for seasonal influenza (H3N2).

This is an update to treatment recommendations in an evolving public health event. Recommendations are subject to change.

**If Swine Influenza is Suspected:**

**Empiric antiviral treatment should be considered for confirmed, probable or suspected cases of swine influenza A (H1N1) virus infection. Antiviral treatment with zanamivir or oseltamivir should be initiated as soon as possible after the onset of symptoms.** If resources are limited, treatment of hospitalized patients and patients at higher risk for influenza complications should be prioritized.

**This swine influenza A (H1N1) virus is sensitive (susceptible) to the neuraminidase inhibitor antiviral medications zanamivir (Relenza, GSK) and oseltamivir (Tamiflu, Roche).**

The currently circulating strain of Swine influenza is **resistant** to the adamantane antiviral medications: amantadine (Symmetrel, Endo Pharmaceuticals) and rimantadine (e.g., Flumadine, Forest Pharmaceuticals).

**Antiviral Treatment of Confirmed, Probable and Suspected Cases**

*Recommendations for use of antivirals may change as data on antiviral susceptibilities become available.*

Evidence for benefits from treatment in studies of seasonal influenza is strongest when treatment is started within 48 hours of illness onset. However, some studies of treatment of seasonal influenza have indicated benefit, including reductions in mortality or duration of hospitalization even for patients whose treatment was started more than 48 hours after illness

Summary of Management  
Recommendations

Clinicians

- CDC recommends the use of oseltamivir or zanamivir for the treatment and/or prevention of infection with swine influenza viruses.
- Clinicians should continue to consider swine influenza infection in the differential diagnosis of patients with acute febrile respiratory illness who have either been in contact with persons with confirmed swine flu, or who were in one of the U.S. states that have reported swine flu cases or in Mexico during the 7 days preceding their illness onset.
- Patients who meet these criteria should be tested for influenza. Current priorities for testing are in the DHEC Health Alert sent April 27, 2009. <http://www.scdhec.gov/health/disease/han/docs/DHA-Swine-2.pdf>
- Patients with lab findings or clinical history consistent with seasonal influenza should receive antiviral treatment based upon epidemiology of viruses circulating in a community and known patterns of antiviral resistance.

Hospitals

- All patients being admitted for acute respiratory illness with fever should be tested for influenza A virus infection.
- Specimens from hospitalized patients testing positive for influenza A virus should be sent to the state public health laboratory for influenza subtype testing.

onset. **Recommended duration of treatment is five days.**

Recommendations for use of antivirals may change as data on antiviral susceptibilities and effectiveness become available. Antiviral doses recommended for treatment of swine influenza A (H1N1) virus infection in adults or children 1 year of age or older are the same as those recommended for seasonal influenza. Oseltamivir use for children < 1 year old was recently approved by the U.S. Food and Drug Administration (FDA) under an Emergency Use Authorization (EUA), and dosing for these children is age-based. [See Table 1](#) for adult and pediatric dosing for treatment and chemoprophylaxis of swine flu.

### **Antiviral Chemoprophylaxis for Contacts to Confirmed, Probable and Suspected Cases**

For antiviral chemoprophylaxis of swine influenza A (H1N1) virus infection, either oseltamivir or zanamivir are recommended. **Duration of antiviral chemoprophylaxis *post-exposure* is 10 days after the last known exposure to an ill confirmed case of swine influenza A (H1N1) virus infection.**

Antiviral chemoprophylaxis (post-exposure) with either oseltamivir or zanamivir is recommended for:

1. Close contacts of confirmed, probable or suspected cases. This is especially important for those persons who are at high-risk for complications of influenza (e.g., persons with certain chronic medical conditions, persons 65 or older, children younger than 5 years old, and pregnant women).
2. Health care workers or public health workers who were not using appropriate personal protective equipment during close contact with an ill confirmed, probable, or suspect case of swine influenza A (H1N1) virus infection during the case's infectious period.

### **Infants Under 1 Year of Age**

The characteristics of human infections with swine H1N1 viruses are still being studied, and it is not known whether infants are at higher risk for complications associated with swine H1N1 infection compared to older children and adults. Because infants typically have high rates of morbidity and mortality from influenza, infants with swine influenza A (H1N1) influenza infections may benefit from treatment using oseltamivir. Healthcare providers should be aware of the lack of data on safety and dosing when considering oseltamivir use in a seriously ill young infant with confirmed swine H1N1 influenza or who has been exposed to a confirmed swine H1N1 case, and carefully monitor infants for adverse events when oseltamivir is used.

### **Emergency Use Authorization of Tamiflu and Relenza in Pediatric Populations**

The FDA has issued an Emergency Use Authorization (EUA) for the use of Relenza (zanamivir) and [Tamiflu](#) (oseltamivir phosphate) during the current swine flu outbreak. Under the EUA, Tamiflu and Relenza may be given to larger population sectors without compliance with label requirements and can be distributed by some public health officials and volunteers based on state and local laws and/or public health emergency responses. Additionally, the EUA allows for Tamiflu also to be used to treat and prevent influenza in children under 1 year, and to provide alternate dosing recommendations for children older than 1 year. <http://www.fda.gov/bbs/topics/NEWS/2009/NEW02002.html>

### **Pregnant Women**

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. Because of the unknown effects of influenza antiviral drugs on pregnant women and their fetuses, oseltamivir or zanamivir should be used during pregnancy only if the potential benefit justifies the potential risk to the

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embryo or fetus; the manufacturers' package inserts should be consulted. However, 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. Because zanamivir is an inhaled medication and has less systemic absorption, some experts prefer zanamivir over oseltamivir for use in pregnant women when feasible.

<b>Table 1: Swine influenza antiviral medication dosing recommendations (from the CDC, 4/28/2009)</b>			
Agent, group		Treatment	Chemoprophylaxis
Oseltamivir (Tamiflu)		5 Days	10 Days
Adults		75-mg capsule twice per day for 5 days	75-mg capsule once per day
Children (age, 12 months or older), weight:	15 kg or less	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
	>23–40 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
Infants under 12 months of age	<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
Zanamivir (Relenza)		Treatment 5 Days	Chemoprophylaxis 10 Days
Adults		Two 5-mg inhalations (10 mg total) twice per day	Two 5-mg inhalations (10 mg total) once per day
Children (age 7+ for treatment, 5+ for PEP)		Two 5-mg inhalations (10 mg total) twice per day (7 years of age or older)	Two 5-mg inhalations (10 mg total) once per day (5 years of age or older)

## **Interim Recommendations for Treatment of Presumed Seasonal Influenza**

### **(Influenza B or Influenza A that does not meet the criteria for Swine Influenza)**

Persons providing medical care for patients with suspected influenza or persons who are candidates for chemoprophylaxis against influenza should consider the following guidance for assessing and treating patients during the 2008-09 influenza season ([see Table 2 below](#)).

1. Review local or state influenza virus surveillance data weekly during influenza season, to determine which types (A or B) and subtypes of influenza A virus (H3N2 or H1N1) are currently circulating in the area.
2. SC Data on circulating viruses are available from the DHEC website:  
<http://www.scdhec.gov/health/disease/acute/flu.htm>.
3. Providers should consider use of influenza tests that can distinguish influenza A from influenza B.
  - a. Patients testing positive for influenza B may be given either oseltamivir or zanamivir (no preference) if treatment is indicated.
  - b. At this time, if a patient tests positive for influenza A, use of zanamivir should be considered if treatment is indicated. Oseltamivir should be used alone only if recent local surveillance data indicate that circulating viruses are likely to be influenza A (H3N2) or influenza B viruses. Combination treatment with oseltamivir and rimantadine is an acceptable alternative, and might be necessary for patients that cannot receive zanamivir, (e.g., patient is <7 years old, has chronic underlying airways disease, or cannot use the zanamivir inhalation device), or zanamivir is unavailable. Amantadine can be substituted for rimantadine if rimantadine is unavailable.
  - c. If available, confirmatory testing with a diagnostic test capable of distinguishing influenza caused by influenza A (H1N1) virus from influenza caused by influenza A (H3N2) or influenza B virus can also be used to guide treatment. When treatment is indicated, influenza A (H3N2) and influenza B virus infections should be treated with oseltamivir or zanamivir (no preference). Influenza A (H1N1) virus infections should be treated with zanamivir or combination treatment with oseltamivir and rimantadine is an acceptable alternative.

Additional Information is available on treatment of persons with influenza-like illness who test negative via rapid test, or treatment/prophylaxis for individuals at high risk for complications or living in congregate settings is available from the CDC  
(<http://www2a.cdc.gov/HAN/ArchiveSys/ViewMsgV.asp?AlertNum=00279>)

Information on antiviral resistance will be updated in weekly surveillance reports (available at <http://www.cdc.gov/flu/weekly/fluactivity.htm>). For more information on antiviral medications and additional considerations related to antiviral use during the 2008-09 influenza season, visit <http://www.cdc.gov/flu/professionals/antivirals/index.htm>

**TABLE 2**

**Treatment of Seasonal Influenza: CDC's Interim recommendations for the selection of antiviral treatment using laboratory test results and viral surveillance data, United States, 2008-09 season† (CDC, 12/19/2008)**

Rapid antigen or other laboratory test	Predominant virus(es) in community†	Preferred medication(s)	Alternative (combination antiviral treatment)
Not done or negative, but clinical suspicion for influenza	H1N1 or unknown	Zanamivir	Oseltamivir + Rimantadine*
Not done or negative, but clinical suspicion for influenza	H3N2 or B	Oseltamivir or Zanamivir	None
Positive A	H1N1 or unknown	Zanamivir	Oseltamivir + Rimantadine*
Positive A	H3N2 or B	Oseltamivir or Zanamivir	None
Positive B	Any	Oseltamivir or Zanamivir	None
Positive A+B**	H1N1 or unknown	Zanamivir	Oseltamivir + Rimantadine*
Positive A+B**	H3N2 or B	Oseltamivir or Zanamivir	None

† SC Data on circulating viruses are available from the DHEC website:

<http://www.scdhec.gov/health/disease/acute/flu.htm>.

- Amantadine can be substituted for rimantadine but has increased risk of adverse events. Human data are lacking to support the benefits of combination antiviral treatment of influenza; however, these interim recommendations are intended to assist clinicians treating patients who might be infected with oseltamivir-resistant influenza A (H1N1) virus.

\*\* Positive A+B indicates a rapid antigen test that cannot distinguish between influenza and influenza B viruses

‡ Influenza antiviral medications used for treatment are most beneficial when initiated within the first two days of illness. Clinicians should consult the package insert of each antiviral medication for specific dosing information, approved indications and ages, contraindications/warnings/precautions, and adverse effects.

**Resources/References:**

Antiviral Resistance. <http://www.cdc.gov/swineflu/recommendations.htm>

Interim Guidance on Antiviral Recommendations for Patients with Confirmed or Suspected Swine Influenza A (H1N1) Virus Infection and Close Contacts. April 28, 2009 05:00 AM ET.

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