



MEMO

TO: Healthcare Providers
Local Public Health Units

FROM: Kirby Kruger
State Epidemiologist

RE: Swine Influenza A (H1N1)

DATE: May 1, 2009

Update:

The Centers for Disease Control and Prevention (CDC) is reporting 109 human infections with swine-origin influenza A (H1N1) (S-OIV) in the United States. One death in a 22-month-old toddler from Texas has occurred. Eleven states have reported confirmed infections. No confirmed cases have occurred in North Dakota. For more information about cases occurring in the United States, please visit: www.cdc.gov/swineflu/index.htm. If a confirmed or probable case occurs in North Dakota, the media and providers will be notified via a press release and the North Dakota Health Alert Network. North Dakota case counts will be posted at www.ndflu.com.

Testing:

Due to cases of S-OIV occurring in the United States and internationally, the North Dakota Department of Health (NDDoH) and the Division of Laboratory Services (DLS) needs your help to assess the influenza subtype(s) that may be present in our communities.

- Surveillance specimens are tested free-of-charge.
- Collection kits are available at no charge from the NDDoH Division of Laboratory Services at 701.328.6272.
- If you have questions regarding specimen collection, please call Mike Trythall at 701.328.6278.

The NDDoH recommends that providers consider the following recommendations for testing of the following people for influenza infection:

Clinicians should suspect swine-origin influenza A (H1N1) in persons with an acute febrile respiratory illness who:

- Have had close contact within the past 7 days with a person who is a swine-origin influenza A (H1N1) (S-OIV) confirmed case *or*
- Traveled within the past 7 days to a community in the United States or internationally where there are one or more confirmed swine-origin influenza cases (Updated information about areas with confirmed human cases of S-OIV can be found at www.cdc.gov/swineflu/investigation.htm.) *or*
- Reside in a community where there is one or more confirmed S-OIV cases.

Acute febrile respiratory illness is defined as a measured temperature of at least 100° F and recent onset of at least one of the following: cough, rhinorrhea or nasal congestion, or sore throat.

Suspect cases of S-OIV should be reported immediately to the NDDoH Division of Disease Control at 701.328.2378 or toll-free at 800.472.2180. Please do not wait for laboratory results to report.

Clinicians also should test patients admitted to the hospital with influenza-like illness (ILI). ILI is defined as fever (temperature of 100° F or greater) and a cough and/or a sore throat in the absence of a known cause other than influenza.

It is imperative that specimen slips contain patient symptoms and travel history. Testing will be delayed or not performed without this information. Please **DO NOT** submit specimens from individuals that are asymptomatic.

All samples must be kept cold. Send in a cooler with ice packs.

Preferred specimens include a combination of two nasal pharyngeal swabs or oral pharyngeal swabs or nasal washes.

- Submit one dry swab in the small tube enclosed in the collection kit. The other swab should be enclosed in the viral transport media tube also enclosed in the collection kit. If only one swab can be collected submit it in the viral transport media.

Rapid Test Positive Samples

- When influenza A is detected in your laboratory by RAPID TESTING methods, you may send an aliquot (minimum of 0.5ml) of the original suspension (not exposed to test kit reagents).
- Performance of all the different rapid tests is unknown at this time and nasal pharyngeal or oral pharyngeal swabs from patients meeting the case definition should be collected and referred regardless of the rapid test result.

Viral Culture

- When influenza is detected in your laboratory by VIRAL CULTURE, please send the actively growing viral culture tube with 2 ml of viral maintenance media.

Safety

This virus is considered a BSL-2 agent at this time. Diagnostic laboratory work on clinical samples from patients who are suspected cases of swine influenza A (H1N1) virus infection should be conducted in a BSL2 laboratory. All sample manipulations should be done inside a biosafety cabinet (BSC). Clinical laboratories opting to perform virus culture should do all work in a BSL2 laboratory with BSL3 practices including the use of a BSC.

Case Definitions:

A **confirmed case** of S-OIV infection is defined as a person with an acute febrile respiratory illness with laboratory confirmed S-OIV infection at CDC by one or more of the following tests:

- real-time RT-PCR
- viral culture

A **probable case** of S-OIV infection is defined as a person with an acute febrile respiratory illness who is positive for influenza A, but negative for H1 and H3 by influenza RT-PCR

A **suspected case** of S-OIV infection is defined as a person with acute febrile respiratory illness with onset

- within 7 days of close contact with a person who is a confirmed case of S-OIV infection, or
- within 7 days of travel to community either within the United States or internationally where there are one or more confirmed cases of S-OIV infection, or
- resides in a community where there is one or more confirmed cases of S-OIV infection.

Infectious period for a confirmed case of swine influenza A (H1N1) virus infection is defined as 1 day prior to the case's illness onset to 7 days after onset.

Close contact is defined as: within about 6 feet of an ill person who is a confirmed or suspected case of swine-origin influenza A (H1N1) virus infection during the case's infectious period.

For more information about case definitions, please visit www.cdc.gov/swineflu/casedef_swineflu.htm.

Treatment and Chemoprophylaxis:

The NDDoH is recommending that healthcare providers prioritize the use of antivirals for treatment of ill patients. We encourage providers to use their own experiences with seasonal influenza to guide them in the use of antivirals.

S-OIV is sensitive (susceptible) to the neuraminidase inhibitor antiviral medications zanamivir and oseltamivir. It is resistant to the adamantane antiviral medications, amantadine and rimantadine. Antiviral treatment should be considered for confirmed, probable or suspected cases of S-OIV. Treatment of hospitalized patients and patients at higher risk for influenza complications should be prioritized.

Antiviral treatment with zanamivir or oseltamivir should be initiated as soon as possible after the onset of symptoms. 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 onset.

Recommended duration of treatment is five days. Antiviral doses recommended for treatment of S-OIV 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.

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

embryo or fetus; the manufacturers' package inserts should be consulted. Because of its systemic activity, oseltamivir is preferred for treatment of pregnant women.

For antiviral chemoprophylaxis of S-OIV, 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 S-OIV. Post exposure prophylaxis should be considered for contact during the *infectious period* (e.g., one day before until 7 days after the case's onset of illness). If the contact occurred more than 7 days earlier, then prophylaxis is not necessary.

For *pre-exposure* protection, chemoprophylaxis should be given during the potential exposure period and continued for 10 days after the last known exposure to an ill confirmed case of swine-origin influenza A (H1N1) virus infection. Oseltamivir can also be used for chemoprophylaxis under the EUA.

Antiviral chemoprophylaxis with either oseltamivir or zanamivir is **recommended** for the following individuals:

1. Household close contacts 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) of a confirmed or probable case.
2. Healthcare 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-origin influenza A (H1N1) virus infection during the case's infectious period. See guidelines on [personal protective equipment](#).

Antiviral chemoprophylaxis with either oseltamivir or zanamivir can be **considered** for other high-risk groups. For more information about treatment and/or chemoprophylaxis, please visit: www.cdc.gov/swineflu/recommendations.htm.

Please see the attached table for information on antiviral dosages.

Infection Control:

To prevent the transmission of **all** respiratory infections in healthcare settings, including swine influenza A (H1N1), Respiratory Hygiene/Cough Etiquette infection control measures (see <http://www.cdc.gov/flu/professionals/infectioncontrol/resphygiene.htm>) should be implemented at the first point of contact with a potentially infected person. They should be incorporated into infection control practices as one component of Standard Precautions.

Healthcare facilities should establish mechanisms to screen patients for signs and symptoms of febrile respiratory illness who are presenting to any point of entry to the facility for care or making appointments to be seen at the facility. Provisions should be made to allow for prompt segregation and assessment of symptomatic patients.

For more information about infection control, please visit: www.cdc.gov/swineflu/guidelines_infection_control.htm.

cc: Dr. Terry Dwelle, State Health Officer
Dr. Craig Lambrecht, State Medical Officer



Swine Influenza A (H1N1) Virus Antiviral Dosing Recommendations (05/01/2009)

Dosing Recommendations*

Agent, group		Treatment	Chemoprophylaxis
Oseltamivir			
	Adults	75 mg capsule twice per day for 5 days	75 mg capsule once per day
Children	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
	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
Zanamivir			
	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 of older)

Dosing Recommendations for Antiviral Treatment of Children Younger than 1 Year Using Oseltamivir**

Age	Recommended Treatment Dose for 5 Days
< 3 months	12 mg twice daily
3 – 5 months	20 mg twice daily
6 – 11 months	25 mg twice daily

Dosing Recommendations for Antiviral Chemoprophylaxis of Children Younger than 1 Year Using Oseltamivir**

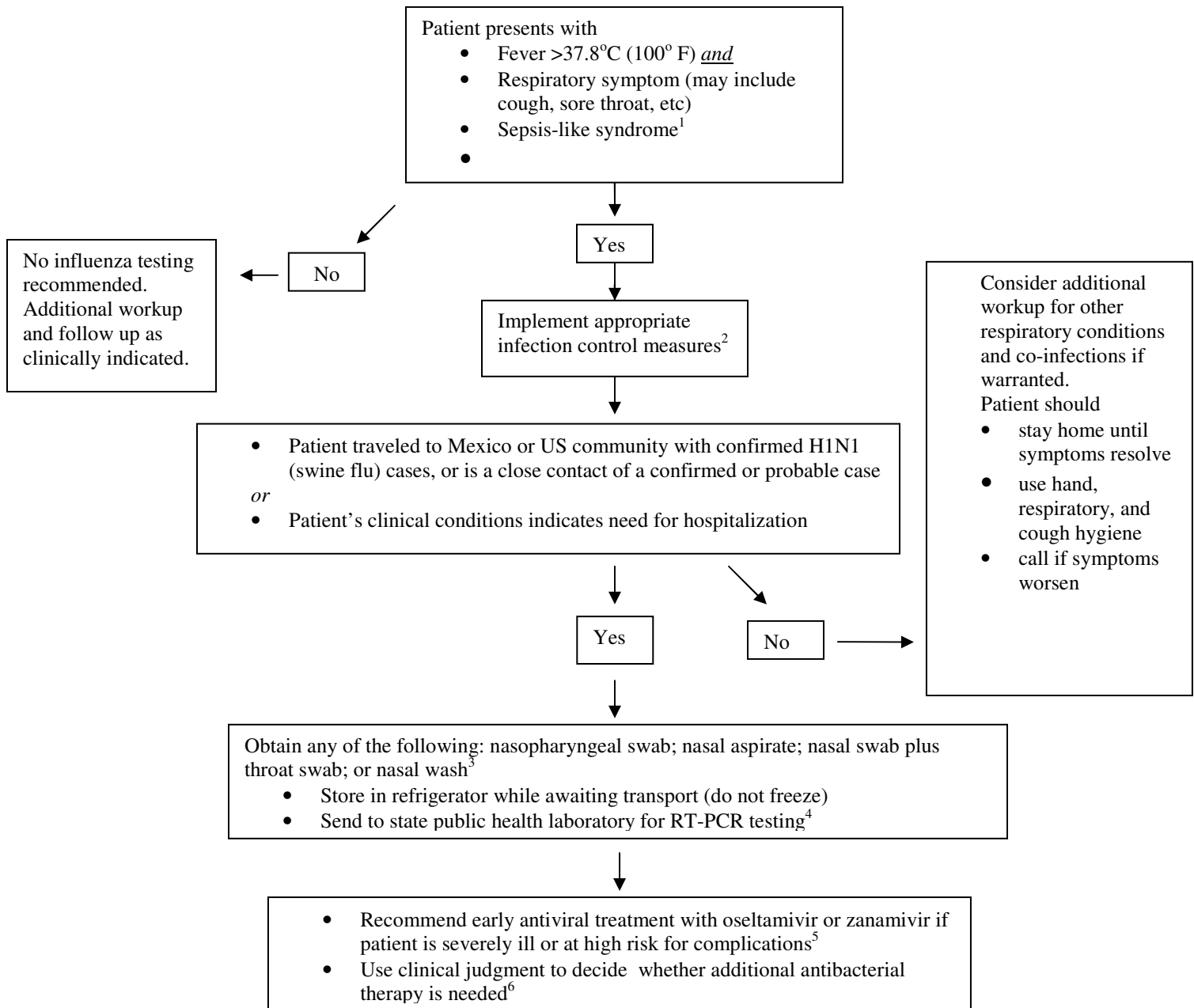
Age	Recommended Treatment Dose for 5 Days
< 3 months	Not recommended unless situation judged critical due to limited data on use in this age group
3 – 5 months	20 mg once daily
6 – 11 months	25 mg once daily

*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. Oseltamivir or zanamivir should be used during pregnancy only if the potential benefit justifies the potential risk to the 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.

**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). Because infants typically have high rates of morbidity and mortality from influenza, infants with swine-origin influenza A (H1N1) 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-origin H1N1 influenza or who has been exposed to a confirmed swine H1N1 case, and carefully monitor infants for adverse events when oseltamivir is used.

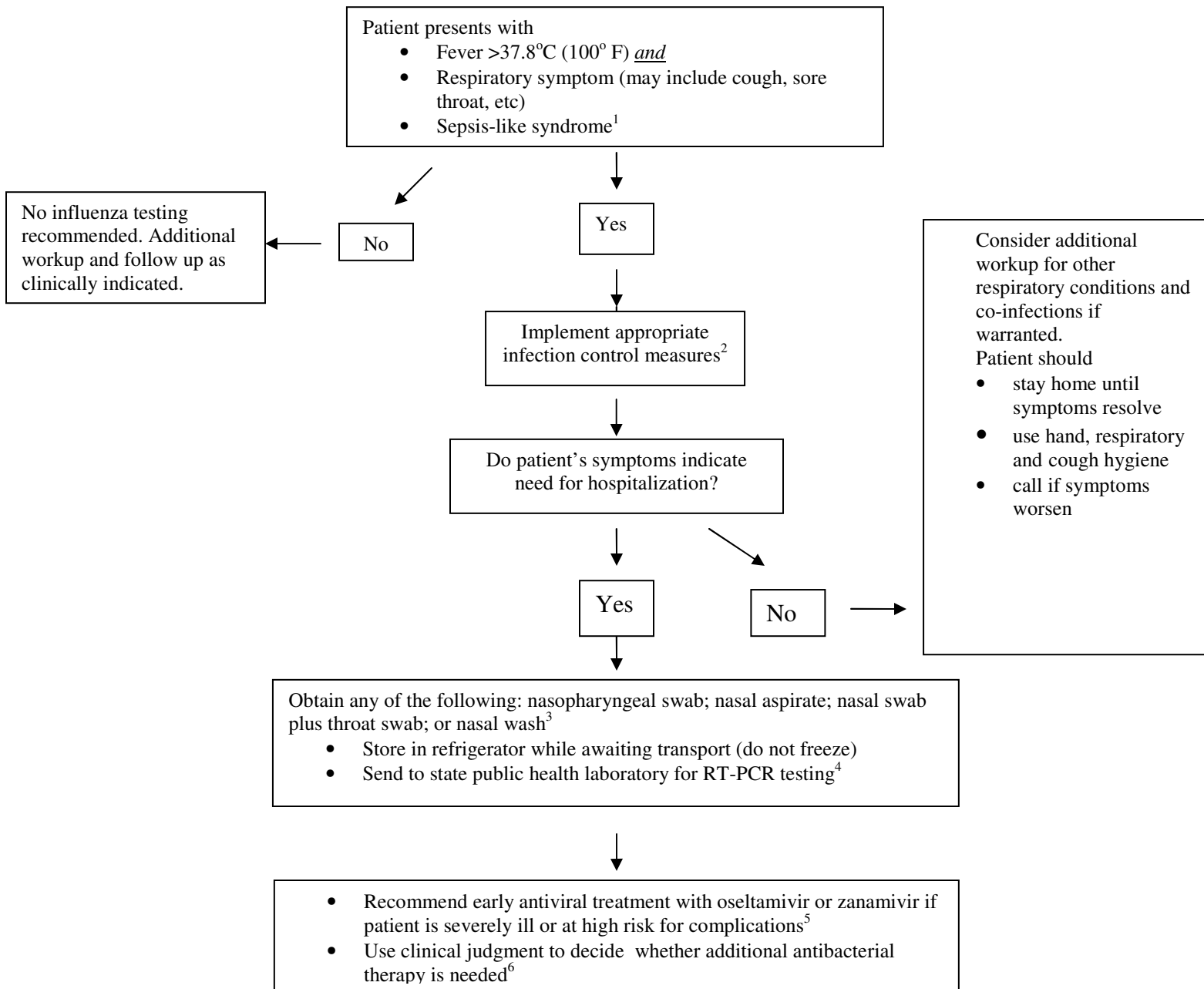
For more information, visit: www.cdc.gov/swineflu or www.ndflu.com.

**Algorithm to assist in decisions on testing and treatment for H1N1 (swine flu) Virus
in Regions (state or metropolitan area) with Fewer than 5 confirmed Cases**



1. As with seasonal influenza, infants, adults ≥ 65 years-old and persons with compromised immune systems may have atypical presentations.
 2. Information on infection control can be found at: http://www.cdc.gov/swineflu/guidelines_infection_control.htm
 3. Nasal washes require appropriate personal protective equipment. See: http://www.cdc.gov/swineflu/guidelines_infection_control.htm⁴³.
 Real-time polymerase chain reaction (RT-PCR) is the preferred laboratory test for identifying H1N1 (swine flu) virus. Rapid antigen tests and immunofluorescence tests have unknown sensitivity and specificity to detect H1N1 (swine flu) virus. For more information, please see <http://www.cdc.gov/swineflu/specimencollection.htm>.
 5. Interim guidance for antiviral use can be found at: <http://www.cdc.gov/swineflu/recommendations.htm>
 6. Interim guidance for clinicians is available at: <http://www.cdc.gov/swineflu/identifyingpatients.htm>
Please note: these algorithms do *not* apply to providers participating in the US Outpatient Influenza-like Illness Surveillance Network (ILINet). For guidance related to ILI Net see: <http://www.cdc.gov/h1n1flu/screening.htm>

**Algorithm to assist in decisions on testing and treatment for H1N1 (swine flu) Virus
in Regions (state or metropolitan area) with 5 or more Confirmed Cases**



1. As with seasonal influenza, infants, adults ≥ 65 years-old, and persons with compromised immune systems may have atypical presentations.
2. Information on infection control can be found at: http://www.cdc.gov/swineflu/guidelines_infection_control.htm
3. Nasal washes require appropriate personal protective equipment. See: http://www.cdc.gov/swineflu/guidelines_infection_control.htm
4. Real-time polymerase chain reaction (RT-PCR) is the preferred laboratory test for identifying S-OIV. Rapid antigen tests and immunofluorescence tests have unknown sensitivity and specificity to detect S-OIV H1N1. For more information, please see <http://www.cdc.gov/swineflu/specimencollection.htm>.
5. Information on use of antiviral agents can be found at: <http://www.cdc.gov/swineflu/recommendations.htm>
6. Interim guidance for clinicians is available at: <http://www.cdc.gov/swineflu/identifyingpatients.htm>



Swine Flu

Interim Guidance for Clinicians on Identifying and Caring for Patients with Swine-origin Influenza A (H1N1) Virus Infection

April 29, 2009 2:00 AM ET

Objective: This document provides interim guidance for clinicians who might provide care for patients with swine-origin influenza A (H1N1) or suspected swine-origin influenza A (H1N1) virus infection. It will be periodically updated as information becomes available.

Transmission

Transmission of swine-origin influenza A(H1N1) is being studied as part of the ongoing outbreak investigation, but limited data available indicate that this virus is transmitted in ways similar to other influenza viruses. Seasonal human influenza viruses are spread from person to person primarily through large-particle respiratory droplet transmission (e.g., when an infected person coughs or sneezes near a susceptible person). 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 (<1 meter) through the air. Contact with respiratory-droplet contaminated surfaces is another possible source of transmission. Because data from swine-origin influenza viruses are limited, the potential for ocular, conjunctival, or gastrointestinal infection is unknown. Since this is a novel influenza A virus in humans, transmission from infected persons to close contacts might be common. All respiratory secretions and bodily fluids (diarrheal stool) of swine-origin influenza A (H1N1) cases should be considered potentially infectious.

Incubation period

The estimated incubation period is unknown and could range from 1-7 days, and more likely 1-4 days.

Persons with confirmed Swine-origin influenza A (H1N1) virus infection

A **confirmed case** of S-OIV infection is defined as a person with an acute febrile respiratory illness with laboratory confirmed S-OIV infection at CDC by one or more of the following tests:

1. real-time RT-PCR
2. viral culture

Case definitions for *Probable* and *Suspected* cases can be found at: http://www.cdc.gov/swineflu/casedef_swineflu.htm

Clinicians should suspect swine-origin influenza A (H1N1) in persons with an acute febrile respiratory illness who

- Have had close contact with a person who is a swine-origin influenza confirmed case *or*
- Traveled to a community in the United States or internationally where there are one or more confirmed swine-origin influenza cases (Updated information about areas with confirmed human cases of swine-origin influenza A (H1N1) can be found at <http://www.cdc.gov/swineflu/investigation.htm>.) *or*
- Reside in a community where there are one or more confirmed swine-origin influenza A (H1N1) cases.

Clinical Findings

Patients with uncomplicated disease due to confirmed swine-origin influenza A (H1N1) virus infection have experienced fever, headache, upper respiratory tract symptoms (cough, sore throat, rhinorrhea), myalgia, fatigue, vomiting, or diarrhea.

Complications

There is insufficient information to date about clinical complications of this variant of swine-origin influenza A (H1N1) virus infection. Among persons infected with previous variants of swine influenza virus, clinical syndromes have ranged from mild respiratory illness, to lower respiratory tract illness,

dehydration, or pneumonia. Deaths caused by previous variants of swine influenza have occasionally occurred. Although data on the spectrum of illness is not yet available for this new variant of swine-origin influenza A(H1N1), clinicians should expect complications to be similar to seasonal influenza: exacerbation of underlying chronic medical conditions, upper respiratory tract disease (sinusitis, otitis media, croup) lower respiratory tract disease (pneumonia, bronchiolitis, status asthmaticus), cardiac (myocarditis, pericarditis), musculoskeletal (myositis, rhabdomyolysis), neurologic (acute and post-infectious encephalopathy, encephalitis, febrile seizures, status epilepticus), toxic shock syndrome, and secondary bacterial pneumonia with or without sepsis.

Groups at high risk for complications

There are insufficient data available at this point to determine who is at higher risk for complications of swine-origin influenza A (H1N1) virus infection. At this time, the same age and risk groups who are at higher risk for seasonal influenza complications should also be considered at higher risk for swine-origin influenza complications .

High risk groups for seasonal influenza complications include: infants aged 12–24 months; HIV-infected persons; adults aged >65 years, residents of any age of nursing homes or other long-term care institutions; and persons with asthma or other chronic pulmonary diseases, such as cystic fibrosis in children or chronic obstructive pulmonary disease in adults, hemodynamically significant cardiac disease ,immunosuppressive disorders or who are receiving immunosuppressive drugs, sickle cell anemia and other hemoglobinopathies, diseases that requiring long-term aspirin therapy, such as rheumatoid arthritis or Kawasaki disease, chronic renal dysfunction, cancer, chronic metabolic disease, such as diabetes mellitus, neuromuscular disorders, seizure disorders, or cognitive dysfunction that may compromise the handling of respiratory secretions.

Reporting suspect swine-origin influenza A (H1N1) virus infection

Clinicians should contact their state public health department to report suspected cases of swine-origin influenza A (H1N1) virus infection and to obtain information on what clinical and epidemiological data to collect and specimen shipment protocols in their state.


Testing for swine-origin influenza A (H1N1) virus

Clinicians should consider testing suspected cases of swine-origin influenza A (H1N1), especially those with severe illness, by obtaining an upper respiratory specimens, such as a nasopharyngeal swab or wash, or nasal wash/aspirate, or tracheal aspirate, to test for swine-origin influenza A (H1N1) virus. Specimens should be tested by the state public health laboratory. Interim guidance on specimen collection ,processing, and testing for patients with suspected swine-origin influenza A (H1N1) virus infection can be found at: <http://www.cdc.gov/swineflu/specimencollection.htm>

Treatment for swine-origin influenza A (H1N1)

The swine-origin influenza virus is susceptible to both oseltamivir and zanamivir. It is resistant to amantadine and rimantadine. Interim guidance on antiviral treatment for swine-origin influenza A (H1N1) can be found at: <http://www.cdc.gov/swineflu/recommendations.htm>

Additional Therapy

Additional therapy such as antibacterial agents, should be used at the discretion of the clinicians given the patients clinical presentation. For antibacterial treatment of pneumonia, clinical guidance for community-acquired pneumonia should be followed and can be accessed at <http://www.journals.uchicago.edu/doi/pdf/10.1086/511159?cookieSet=1>. 

For hospitalized patients with severe community-acquired pneumonia (CAP) requiring intensive care unit admission, methicillin-resistant *Staphylococcus aureus* (MRSA) infection should be suspected and treated empirically in addition to other causes of CAP if they have 1) necrotizing or cavitary infiltrates or 2) empyema.

Infectious period

The duration of shedding with swine-origin influenza A (H1N1) virus is unknown. Therefore, until data are available, the estimated duration of viral shedding is based upon seasonal influenza virus infection. Infected persons are assumed to be shedding virus from the day prior to illness onset until resolution of symptoms. Persons with swine-origin influenza A (H1N1) virus infection should be considered potentially contagious for up to 7 days following illness onset. Persons who continue to be ill longer than 7 days after illness onset should be considered potentially contagious until symptoms have resolved. Children, especially younger children, might be contagious for longer periods.

Infection Control Measures

Guidance on infection control during care of patients with confirmed or suspected swine-origin influenza A (H1N1) virus infection can be found at: http://www.cdc.gov/swineflu/guidelines_infection_control.htm

Antiviral Chemoprophylaxis

Guidance on pre-exposure and post-exposure chemoprophylaxis with antiviral agents for swine-origin influenza A (H1N1) virus can be found at: <http://www.cdc.gov/swineflu/recommendations.htm>

Additional Information

Additional information on swine-origin influenza can be found at: <http://www.cdc.gov/swineflu/>

- Links to non-federal organizations are provided solely as a service to our users. These links do not constitute an endorsement of these organizations or their programs by CDC or the federal government, and none should be inferred. CDC is not responsible for the content of the individual organization Web pages found at these links.

File Formas Help:



[How do you view different file formats\(PDF, DOC, PPT, MPEG\) on this site?](#)

Page last reviewed April 29, 2009 2:00 AM ET

Page last updated April 29, 2009 2:00 AM ET

Content source: [Centers for Disease Control and Prevention](#)

*Centers for Disease Control and Prevention 1600 Clifton Rd. Atlanta, GA 30333, USA
800-CDC-INFO (800-232-4636) TTY: (888) 232-6348, 24 Hours/Every Day - cdcinfo@cdc.gov*

