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**To:** Healthcare Providers, Hospitals, Laboratories, Local Health Departments

**From:** NYSDOH Bureau of Communicable Disease Control and Wadsworth Laboratory

**HEALTH ADVISORY: UPDATE #3**

**SWINE-ORIGIN INFLUENZA A (H1N1) VIRUS (S-OIV) INFECTION**

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

**Introduction**

The New York State Department of Health (NYSDOH) is providing this advisory regarding the ongoing investigation of swine-origin influenza A (H1N1) virus (S-OIV) infections being conducted by the Centers for Disease Control and Prevention (CDC) and the World Health Organization (WHO).

**\*\*\*Update #3 contains significantly new information/recommendations and should replace all previously released swine influenza A (H1N1) virus Health Advisories\*\*\***

The guidance in 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).

This interim information is based on currently available information and will likely change as additional information becomes available. This 4/30/09 update is current as of 12:00 PM on 4/30/09.

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## 1. Background

CDC is working with the World Health Organization (WHO), state and local officials in all affected states and cities to conduct an ongoing investigation of a nationwide outbreak of human cases of S-OIV infection to determine the source and extent of the infection both in the US and internationally. Cases were first identified when specimens were determined to be positive for influenza A but could not be subtyped with standard methods. Subsequent subtyping at CDC determined that patients were infected with S-OIV. Total numbers of nationwide confirmed cases for this investigation are updated daily on the CDC web site at:

<http://www.cdc.gov/flu/swine/investigation.htm>.

## 2. Case definitions for infection with S-OIV

As of 4/30/09, the CDC case definitions for the purpose of investigation of suspected, probable, and confirmed cases of S-OIV infection are as follows:

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

1. real-time RT-PCR
2. 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
- with onset within 7 days of travel to community either within the United States or internationally where there are one or more confirmed S-OIV cases, or
- that resides in a community where there are one or more confirmed S-OIV cases.

**Acute febrile respiratory illness** is defined as a measured temperature of 37.8°C (100°F) and recent onset of at least one of the following:

1. rhinorrhea or nasal congestion
2. sore throat
3. cough

### 3. Clinical guidance for testing and treatment

Current assumptions made for these clinical guidance recommendations:

- There are adequate stores of antiviral medications to treat all seriously ill patients.
- Prophylactic medication supply limitations are a likely inevitability that will require a focused approach to post exposure prophylaxis for both health care workers (HCW) and high-risk individuals.
- Most influenza illness, including S-OIV infection, will be mild to moderate and self-limiting.
- As a vaccine against S-OIV is developed, antiviral recommendations are likely to change.
- There are insufficient laboratory testing resources to perform S-OIV confirmatory testing on all patients with symptoms of influenza.

#### *Clinical Assessment*

These guidelines are intended to provide a general approach. Clinicians are urged to continue their normal practice to every extent possible and apply sound clinical judgment to the approach of each individual patient. It is important to remember that the clinical symptoms and presentation of S-OIV infection may be similar to other respiratory illnesses and should be considered in the context of a complete differential diagnosis.

Exposure (to a confirmed or probable S-OIV case or to a geographic area where S-OIV has been identified) alone is not an indication for hospital or emergency room referral.

Patients who report mild illness AND who have no underlying medical conditions that place them at higher risk of complications from influenza need not be seen in the office. These patients can be screened by phone, given symptomatic treatment recommendations, and instructed to contact their physician for any signs of worsening severity of illness. With the current limitations in confirmatory testing capacity, for typical clinical management purposes, **patients with mild illness should NOT be tested for influenza because screening tests will not influence treatment decisions.**

Patients who report serious illness should be further evaluated; the most appropriate setting for the evaluation of a severely ill patient may be the hospital emergency room. Do **NOT** send patients to an emergency department unless you believe hospital admission may be warranted.

**Any unusual clusters of febrile respiratory illness should be reported to the LHD immediately. Local public health authorities may request testing of patients associated with a suspect outbreak, even if the patient's illness is mild.**

### Antiviral Treatment

Antiviral treatment is **recommended** for the following individuals:

1. Confirmed, probable, or suspected cases of S-OIV infection in hospitalized patients.
2. Confirmed, probable, or suspected cases of S-OIV infection in patients with high-risk for influenza complications.

Antiviral treatment can be **considered** for the following:

1. Any other confirmed, probable, or suspected cases of S-OIV infection.

Antiviral treatment with zanamivir or oseltamivir should be initiated as soon as possible (ideally within 48 hours) after the onset of symptoms. Recommended duration of treatment is 5 days. The S-OIV is sensitive (not resistant) to the neuraminidase inhibitors, oseltamivir and zanamivir, and resistant (not sensitive) to the adamantanes, amantadine and rimantadine.

There are insufficient data available at this point to determine who is at higher risk for complications of S-OIV 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 S-OIV infection complications. Conditions that increase the risk of complications of seasonal influenza infection include:

- Chronic pulmonary, cardiovascular, renal, hepatic, hematological, or metabolic disorders (including diabetes mellitus)
- Immunosuppression
- HIV-infected persons
- Compromised respiratory function, including conditions which increase the risk for aspiration
- Pregnancy (see special guidance on pregnant women noted in Section 6)
- Elderly >65 years
- Residence (regardless of age) in a nursing home or other long-term care institution
- Children  $\leq 2$  years (see special guidance on young children noted in Section 6)

Table 1: Summary of testing and treatment recommendations for patients with suspect, probable, or confirmed S-OIV infection

	Mild Illness		Severe Illness	
	TEST?	TREAT?	TEST?	TREAT?
High-risk medical conditions that increase complications of influenza	NO	Recommended	YES	Recommended
NO high-risk medical conditions that increase complications of influenza	TEST?	TREAT?	TEST?	TREAT?
	NO	Consider	YES	Recommended

### Antiviral Prophylaxis

When prophylaxis is indicated, either oseltamivir or zanamivir should be initiated as soon as possible following the exposure and should continue for **10 days** following the last known exposure to S-OIV infection.

Antiviral chemoprophylaxis is **recommended** for the following individuals:

1. Household close contacts who are at high-risk for complications of influenza of a suspected case.
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 suspected case of S-OIV infection during the case's infectious period.

Antiviral chemoprophylaxis can be **considered** for the following:

1. Household close contacts who are at high-risk for complications of influenza of a suspected case.
2. Children attending school or daycare who are at high-risk for complications of influenza and who had close contact (face-to-face) with a confirmed, probable, or suspected case.
3. Health care workers who are at high-risk for complications of influenza who are working in an area of the healthcare facility that contains patients with confirmed S-OIV cases, or who are caring for patients with any acute febrile respiratory illness.
4. Travelers to Mexico who are at high-risk for complications of influenza. (Note: A travel warning is currently in effect indicating that nonessential travel to Mexico should be avoided).
5. First responders who are at high-risk for complications of influenza and who are working in areas with confirmed cases of S-OIV infection.

Table 2: S-OIV antiviral medication dosing recommendations (table extracted from Infectious Disease Society of America guidelines for seasonal influenza)

Agent, group		Treatment	Chemoprophylaxis
<b>Oseltamivir</b>			
Adults		75 mg capsule twice per day for 5 days	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)

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

#### **4. Infection control for outpatient and emergency room settings**

Note: Further guidance on infection control, including for inpatient settings, is being revised by CDC and will be available on their website at: <http://www.cdc.gov/swineflu/guidance/>.

- Clinics and private practice settings where patients typically call ahead to schedule an appointment should try to group patients with acute febrile respiratory illness towards the end of the day, to avoid exposure to other patients.
- Signs in appropriate languages for the community should be posted at entrances instructing persons with acute febrile respiratory illness to:
  - Perform hand hygiene, don a surgical mask, and notify staff as soon as possible prior to or upon entry to the office/clinic;
  - Cover their nose/mouth when coughing or sneezing;
  - Cough or sneeze into a tissue or their sleeve;
  - Dispose of tissues in the nearest waste receptacle after use; and
  - Perform hand hygiene after contact with respiratory secretions.
- Place symptomatic patients in a separate room with the door closed as soon as possible to limit their time in common waiting areas. There is no longer a need to place these patients in an Airborne Infection Isolation Room (AIIR) unless performing aerosol-generating procedures.
- If necessary, designate separate waiting areas for patients with acute febrile respiratory illness to sit at least three to six feet away from others.
- Masks, tissues, and alcohol hand rub products should be easily available for staff and patient use.
  - Provide tissues and no-touch receptacles (e.g., waste containers with pedal-operated lid or uncovered waste container) for used tissue disposal.
  - Provide soap and disposable towels for hand washing where sinks are available.
- Healthcare workers evaluating, treating, or collecting specimens from a patient with acute febrile respiratory illness should don maximal personal protective equipment (PPE) whenever in the patient's room. This includes:
  - Gloves, face shield or goggles, and gowns
  - N95 respirator or equivalent, when available
  - If N95 respirators are unavailable, a surgical mask should be used
  - Because N95 respirator supply is likely to be limited, practices may elect to reserve their use for aerosol-generating procedures (nebulizer treatments, suctioning, intubation, sputum collection, and bronchoscopy)
  - PPE should be removed and disposed of in a receptacle prior to or upon exiting a patient room and hand hygiene performed immediately
- Aerosol-generating procedures should be performed in an AIIR.
- Routine cleaning and disinfection strategies used during influenza season can be applied to the environmental management of S-OIV.
  - Management of laundry, utensils, and medical waste should also be performed in accordance with procedures followed for seasonal influenza.
  - More information can be found at:  
[http://www.cdc.gov/ncidod/dhqp/gl\\_environmentinfection.html](http://www.cdc.gov/ncidod/dhqp/gl_environmentinfection.html).
- High touch surfaces and items (doorknobs, elevator buttons, restrooms, chairs, etc.) should be regularly cleaned and disinfected with appropriate agents.
- All staff should be aware of the policies and enforce them strictly.

## 5. Public health notification

Clinicians should contact their LHD to report any unusual clusters of acute febrile respiratory illness and any suspect case(s) meeting the case definitions, especially if the patient(s) is (are) severely ill. Due to the high volume of expected suspect cases and requests for confirmatory testing, only the highest priority specimens will be submitted to Wadsworth Center for confirmatory testing. **All hospitals and providers desiring to submit S-OIV specimens to Wadsworth Center MUST coordinate submission through their LHD.**

The LHD will be the primary consultant and will work closely with hospitals and providers to determine which specimens should be submitted to the Wadsworth Center, according to epidemiologic criteria defined by the NYSDOH. Once the LHD and NYSDOH have decided that the criteria have been met, the LHD will give approval to the clinician for the patient specimen to be submitted to Wadsworth Center for testing. The clinician should complete the NYSDOH Virus Detection History Form, DOH-1795

(<http://www.wadsworth.org/divisions/infdis/virology/forms/VRSLPatientHistoryFormDOH-1795.pdf>) noting testing is for a suspect case of S-OIV infection. Also note relevant patient clinical and travel history on this form and results of any influenza laboratory testing that has already been performed. Specimens should be shipped refrigerated (not frozen) overnight to Wadsworth Center Griffin Laboratory. Specific instructions and contact information for providers are available at: <http://www.wadsworth.org/divisions/infdis/virology/collectsubmit.htm>.

## 6. Continuing guidance

The NYSDOH will provide updated guidance as additional information and CDC recommendations become available. Updated information is frequently posted on the CDC website at: <http://www.cdc.gov/flu/swine/investigation.htm>.

Several additional CDC guidance documents can be found at <http://www.cdc.gov/swineflu/guidance/>. Currently posted guidance documents include:

- Guidance-HIV-Infected Adults and Adolescents: Considerations for Clinicians Regarding Swine-Origin Influenza A (H1N1) Virus, 4/30/09
- Guidance for Emergency Medical Services (EMS) Systems and 9-1-1 Public Safety Answering Points (PSAPs) for Management of Patients with Confirmed or Suspected Infection, 4/29/09
- Emergency Use Authorization (EUA) of Medical Products and Devices, 4/29/09
- Guidance for Clinicians on Identifying and Caring for Patients, 4/29/09
- Guidance for Clinicians on Prevention and Treatment in Young Children, 4/28/09
- Antiviral Recommendations for Patients and Close Contacts, 4/29/09
- Biosafety Guidelines for Lab Workers, 4/24/09
- Interim Guidance for Infection Control for Care of Patients with Confirmed or Suspected Swine Influenza A (H1N1) Virus Infection in a Healthcare Setting, 4/29/09
- Guidance on Case Definitions for Investigations of Cases, 4/30/09
- Taking Care of a Sick Person in Your Home, 4/25/09
- Guidance for Airlines Regarding Flight Crews Arriving from Domestic and International Areas Affected by Swine Influenza, 4/28/09
- Guidance to Assist Flight Deck and Cabin Crew in Identifying Passengers Who May Have Swine Influenza, 4/28/09
- Pregnant Women: Considerations for Clinicians, 4/28/09

## **7. Epidemiologic criteria for submission of specimens to NYSDOH Wadsworth Center**

The following outlines the epidemiologic criteria that the LHD will apply for S-OIV surveillance.

For counties with confirmed S-OIV cases or directly bordering an area with confirmed cases:

- At this time, NO specimens from suspect cases with mild illness should be sent to Wadsworth Center
- Priority should be given to specimens from persons with acute febrile respiratory illness who:

**EITHER**

1. Are admitted to the hospital and test positive for Influenza A

**OR**

2. Are associated with acute febrile respiratory illness outbreaks (community-associated or health care facility-associated)

- The highest priority will be given to those with non-subtypeable Influenza A.

For counties with NO confirmed S-OIV cases within or in geographic areas directly bordering the county:

- Priority should be given to specimens from persons with acute febrile respiratory illness who:

**EITHER**

1. Meet the suspect case definition (as defined)

**OR**

2. Are admitted to the hospital and test positive for Influenza A

**OR**

3. Are associated with acute febrile respiratory illness outbreaks (community-associated or health care facility-associated)

- The highest priority specimens are from patients with non-subtypeable Influenza A.
- As S-OIV disease is confirmed in other geographic regions of the state, those affected counties (and all contiguous bordering counties) will then follow the guidance detailed above for counties with confirmed S-OIV or directly bordering an area with confirmed S-OIV cases.

## 8. S-OIV biosafety guidelines for laboratory workers

This guidance is for laboratory workers who may be processing or performing diagnostic testing, including virus isolation, on specimens from patients with suspected S-OIV infection.

Diagnostic laboratory work on clinical samples from patients who are suspected cases of S-OIV infection should be conducted in a BSL2 laboratory. All sample manipulations should be done inside a biosafety cabinet (BSC).

Viral isolation on clinical specimens from patients who are suspected cases of S-OIV infection should be performed in a BSL2 laboratory with BSL3 practices (enhanced BSL2 conditions) as described below.

Additional precautions for viral isolation procedures include:

- \* Recommended Personal Protective Equipment (based on site specific risk assessment)
- \* Respiratory protection – fit-tested N95 respirator or higher level of protection.
- \* Shoe covers
- \* Closed-front gown
- \* Double gloves
- \* Eye protection (goggles or face shields)

Waste

- \* All waste disposal procedures should be followed as outlined in your facility standard laboratory operating procedures.

Appropriate disinfectants

- \* 70% Ethanol
- \* 5% Lysol
- \* 10% Bleach

All personnel should self monitor for fever and any symptoms of S-OIV infection, which include cough, sore throat, vomiting, diarrhea, headache, runny nose, and muscle aches. Any illness should be reported to your supervisor immediately.

For personnel who had unprotected exposure or a known breach in personal protective equipment to clinical material or live virus from a confirmed case of S-OIV, antiviral chemoprophylaxis with zanamivir or oseltamivir for 10 days after exposure can be considered.

## 9. Diagnostic Laboratory Testing for Suspected S-OIV Infection

- Collect one nasopharyngeal swab or nasopharyngeal aspirate or nasopharyngeal wash, for submission to the Wadsworth Center for molecular testing. Note: preferred specimen is nasopharyngeal swab in viral transport medium. **Use Dacron or rayon swabs with a fine-tip flexible metal shaft, or NP-flocked swab with flexible plastic shaft, for nasopharyngeal swab. Do not use calcium alginate or wooden-shafted swabs. Place swab in sterile vial containing 2 ml of viral transport medium. Keep sample cold (4°C) after collection.**

### Collection Guidelines:

- **Nasopharyngeal swab:** Use a swab with a fine, flexible metal shaft and Dacron or rayon tip, or a flocked swab with long, flexible, plastic shaft, specific for nasopharyngeal swab sample collection. Insert swab into posterior nasopharynx. Rub swab against mucosal surface and leave in place for 5 seconds to absorb secretions. Collection of specimens from both nostrils increases amount of material available for analysis. Place swab in a vial of viral transport medium. Use scissors to cut metal shaft, or snap plastic shaft of flocked swab, so that top of vial can be screwed on tightly.
- **Nasopharyngeal aspirate:** Requires source of suction (syringe, vacuum pump, or wall suction), specimen trap with two outlets, and catheter (no. 6 to 14 depending on size of patient). Without applying suction, insert catheter through nose into posterior nasopharynx (approximately the distance from tip of the nose to the external opening of the ear when measured in a straight line). Apply gentle suction, leaving catheter in place for a few seconds, then withdraw slowly. Suction contents of a vial of viral transport medium or non-bacteriostatic saline through catheter tubing to assist in moving material from tubing into trap and to add viral transport media to specimen. Transfer specimen to a screw cap tube for transport to laboratory.
- **Nasopharyngeal wash:** Use rubber bulb (1-2 oz for infants) or syringe to instill 3-5 ml of non-bacteriostatic saline into one nostril while occluding the other. If patient is able to co-operate, instruct them to close glottis by making a humming sound with mouth open. If a rubber bulb is used, release pressure on bulb to allow saline and mucus to enter bulb. Remove from nose and squeeze into vial of transport media. If syringe is used, apply suction to syringe to recover saline and nasal secretions. Alternately, hold sterile container such as urine cup under patient's nose and ask patient to expel material into it. In either case, add recovered saline-nasal secretions to a vial of viral transport media.
- Results of testing of initial cases suggest that rapid EIA influenza tests may be insensitive for the detection of S-OIV and these assays should not be relied on as screening tests for this agent. However, a rapid influenza antigen detection test may be performed on the nasopharyngeal sample using standard BSL2 work practices in a Class II biological safety cabinet. Regardless of the result, specimens should still be referred to the Wadsworth Center for further testing in coordination with the local health department (LHD).

- At this time the recommended front-line assay is a real-time RT-PCR assay that detects influenza A. If sub-typing assays for H1 and H3 are available, they should also be performed. If the sample is influenza A positive but H1 and H3 negative and therefore not sub-typeable, the sample should be considered as a “probable” case of S-OIV. **Samples producing non-subtypeable results on these assays should be reported to the LHD and shipped immediately to the Wadsworth Center for S-OIV testing.** When shipping, include test results from all assays.
- Submit a completed Virus Reference and Surveillance Laboratory patient history form (<http://www.wadsworth.org/divisions/infdis/virology/forms/VRSLPatientHistoryFormDOH-1795.pdf>) with the specimens.
- Viral culture may be performed on respiratory specimens from patients suspected of having S-OIV infection, who meet the surveillance criteria as described in the advisory update. All specimen manipulations and viral culture procedures should be performed under BSL2 containment with enhancements as described in the laboratory safety guidelines.
- It is essential that specimens be sent to the Viral Reference and Surveillance Laboratory at the Wadsworth Center Griffin Laboratory as soon as possible after collection. If shipped within two days of collection, store at 4°C post-collection and ship with cold packs to maintain temperature at 4°C. Do not use wet ice. If shipment is delayed >2 days, then the specimens should be stored frozen at -70°C and shipped on dry ice.
- It is the shipper’s responsibility to ensure that appropriate shipping materials are used. Please contact your carrier for shipping and packaging information. Patient specimens must be shipped as “Diagnostic Specimens.” All specimens must be shipped "Priority Overnight" and received within 24 hours via chosen carrier.

**Address for courier shipping:**

Wadsworth Center, NYSDOH  
Griffin Laboratory  
Virus Reference and Surveillance Laboratory  
5668 State Farm Road (Rt. 155)  
Slingerlands, NY 12159