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Mayor

HEALTH ADVISORY—NOVEL INFLUENZA A H1N1 (SWINE) VIRUS

Monday, July 6, 2009

Influenza activity in San Francisco (SF) and California (CA) remains elevated and widespread. With increasing numbers of infected persons, there have been continued cases requiring hospitalization and a death in SF (in a > 65 y/o person with underlying medical conditions). Also multiple outbreaks in a variety of places including healthcare settings are occurring throughout CA. Most confirmed influenza infections in northern California continue to be due to novel influenza A H1N1 (swine) virus and the severity of swine flu infections continues to be similar to seasonal flu with most cases being mild. Nevertheless, as noted in other areas experiencing a significant amount of influenza illness, clinicians should anticipate severe disease in persons at higher risk (see list pages 3 and 4) including pregnant women, persons with asthma and children less than 2 years of age.

Clinicians should continue to expect visits from significant numbers of patients with influenza-like illness over the upcoming days and weeks. **Early implementation of appropriate infection control precautions will help prevent the spread of influenza infection within healthcare settings.** All persons with fever or cough should be promptly identified and should wear a surgical mask. Diagnostic distinction between seasonal and swine flu should not alter the appropriate care of patients with influenza-like illness. **Clinicians are encouraged to treat persons with influenza-like illness with underlying conditions that increase their risk for severe influenza with antiviral agents.** The San Francisco Department of Public Health (SFDPH) requests only limited reporting of influenza-like illness and limited testing. See below for specific details.

CONTENTS OF HEALTH ADVISORY:

- SITUATIONAL UPDATE
- ACTIONS REQUESTED OF ALL CLINICIANS: INCLUDING TESTING AND REPORTING
- ANTIVIRAL TREATMENT AND CHEMOPROPHYLAXIS
- INFECTION CONTROL PRECAUTIONS
- INTERNATIONAL TRAVEL INFORMATION
- REQUEST FOR CLINICIANS TO BE SENTINEL PROVIDERS FOR INFLUENZA SURVEILLANCE
- RESOURCES

Changed sections include: **situational update, reporting criteria** (removed request for reports of individual cases from large group residential facilities), **treatment recommendations** (updated antiviral resistance info, modified info about risk factors for severe disease and added info about use of adamantanes, double dosing, and increased duration of treatment in certain situations), **chemoprophylaxis recommendations** (modified definition of 'close contact' and downgraded chemoprophylaxis for health care workers with unprotected exposures to "consider").

Check our website for updates, forms, FAQs and useful links: www.sfdcp.org/swinefluforproviders.html.

Situational Update (as of 7/6/09)

Per clinician reports and lab testing requests and results, influenza activity remains elevated in SF and widespread in CA. Community transmission is common; and, multiple outbreaks within institutions are occurring throughout CA (e.g., hospitals, long term care facilities, summer camps, military bases, and residential facilities). The expected increase in severe cases arises from the expected increase in total cases. The dominant strain in northern

Categories of urgency levels

Health Alert: conveys the highest level of importance; warrants immediate action or attention

Health Advisory: provides important information for a specific incident or situation; may not require immediate action

Health Update: provides updated information regarding an incident or situation; unlikely to require immediate action

California during the first three weeks of June was the novel influenza A H1N1 (swine) virus. Three novel influenza A H1N1 (swine) virus isolates world-wide have demonstrated resistance to oseltamivir, including one from a patient from San Francisco who traveled to Hong Kong in early June. These strains appear to be very rare and not associated with severe disease. SFDPH is working with the California Department of Public Health (CDPH) and the Centers for Disease Control and Prevention (CDC) to investigate further and to increase testing for antiviral resistance in San Francisco and the Bay Area. Although our understanding of swine flu is evolving, the symptoms and severity of illness still appear to be similar to seasonal flu; and the risk factors for severe disease remain similar (see pages 3 and 4).

The ongoing surveillance goals are to:

1. Identify **severe disease** and contribute information to better understand risk factors for complications,
2. Identify cases in long-term care facilities, and
3. Identify **outbreaks** of cases.

The ongoing disease mitigation goals are to:

4. Slow spread especially within populations at high risk for severe disease, and
5. Slow spread by encouraging healthy habits in the general population.

Actions Requested of All Clinicians (updated 7/6/09)

1. **Submit respiratory specimens only from the following patients** for PCR testing by the Public Laboratory System (specimens not meeting these criteria will not be tested):

- a) Patients with influenza-like illness¹ OR
- b) Patients with influenza A as determined by a rapid diagnostic test

AND who also meet at least one of the following criteria:

- Died
- Hospitalized (if info is available specific criteria will be “hospitalized for > 24 hours”)
- Live in a long-term care facility (first cases only will be tested)

For specimen collection/submission instructions go to: www.sfcdep.org/swinefluforproviders.html

2. **Report** to SFDPH Disease Control (415-554-2830):
Patients with influenza-like illness¹ who have/are:
 - Died
 - Severely ill (hospitalized and requiring ICU care)
 - A resident of a long-term care facility
 - Part of an outbreak² of influenza-like illness¹ in an institutional³ setting
3. **Treat** patients with influenza-like illness¹ that are hospitalized and/or at high risk for complications.
4. **Provide chemoprophylaxis** to certain close contacts⁴ of swine flu cases, as described below.
5. **Implement** infection control precautions as described below (page 6).
 - Note that ALL PERSONS with fever or cough should wear a surgical mask while present in any health care setting. This includes patients and family members. Quick identification and masking of persons potentially infectious with influenza will prevent exposures to staff and patients.
 - Also note that all persons (excepting patients requiring evaluation and medical care) with influenza-like illness should be instructed to stay at home until they have fully recovered. This includes health-care workers and family and friends of patients.
6. **Provide** guidance about home care of persons with influenza. SFDPH guidance (including a 2 page document and a 61 page handbook) is available at www.sfcdep.org/H1N1ill.html
7. **Encourage** and **facilitate** pneumococcal vaccination for those at increased risk of pneumococcal disease.

Notes & Definitions (updated 7/6/09)

¹ **Influenza-like illness** is defined as fever (>37.8°C or 100°F) and either cough or sore throat.

² **Outbreak** is defined as > 10% of people from the same institution with influenza-like illness who have illness onsets within 3 days.

³ **Institutions** include facilities with household-like living arrangements (e.g., long-term care facility, dormitory, jail, shelter and group residential home) and facilities where people gather for significant amounts of time (e.g., daycare, school, university, and other types of campuses, etc.)

⁴ **Close contact** is described in the Antiviral Post-Exposure Chemoprophylaxis Section (see page 4).

Testing for Seasonal and H1N1 Swine Influenza Virus (10/13/09)

Most patients with clinical illness consistent with uncomplicated influenza do not require diagnostic influenza testing for clinical management.

Rapid Tests. Rapid influenza antigen tests are widely available to clinicians and provide test results at the point of care. Immunofluorescence tests (e.g., DFA) are also available at many laboratories. When influenza virus is circulating in the community (as is currently the case), a positive rapid antigen test or immunofluorescence test for influenza is predictive of infection. However, these tests have important limitations:

- Low sensitivity for detecting influenza (10 – 70% for H1N1 swine flu and 60 – 80% for seasonal flu with rapid antigen tests; sensitivities with immunofluorescence testing is slightly higher). Therefore, a negative rapid antigen test or immunofluorescence test does not rule out infection with seasonal or H1N1 swine influenza. Based on the clinical presentation, empiric antiviral therapy or confirmatory diagnostic testing may be appropriate.
- Some rapid antigen tests can distinguish between influenza A and B, while others cannot. Check the product information or www.cdc.gov/flu/professionals/diagnosis/rapidclin.htm to determine test capabilities.
- Currently, there is no rapid antigen test or immunofluorescence test for influenza A that can distinguish between seasonal influenza A virus and H1N1 swine influenza A virus.

For additional information on rapid tests, see: www.cdc.gov/h1n1flu/guidance/rapid_testing.htm

Confirmatory Tests. Real-time PCR is the recommended test for confirmation of H1N1 swine influenza cases. Viral culture is also diagnostic of influenza infection, but may not yield timely results for clinical management.

PCR is performed by the SFDPH Public Health Lab on specimens meeting the criteria outlined above (see: *Actions Requested of All Clinicians*). The lab first determines the presence of Influenza A by PCR testing. Specimens positive for Influenza A are then tested by PCR for the Human H1 or the Human H3 virus subtype.

- Those positive for either Human H1 or Human H3 are reported as such.
- Those negative for both Human H1 and Human H3 are considered “**untypeable**” and, if the case meets clinical criteria, a case of H1N1 swine influenza.

The SFDPH Public Health Lab is currently performing PCR testing one or two days per week.

Antiviral Treatment for Novel Influenza A H1N1 (Swine) Virus (and seasonal flu) (7/6/09)

Because testing is limited, most cases of swine flu will not be diagnosed. Diagnostic distinction between seasonal and swine flu does not alter the appropriate care of patients with influenza-like illness. Clinicians should treat patients with suspected swine flu as they would treat cases of seasonal flu. Most swine flu cases in the USA have been mild and have not required antiviral treatment. Therefore antiviral treatment is not specifically indicated unless cases are

1. hospitalized OR
2. at high risk for complications of influenza.

People at high risk for complications include:

- Children age 4 years and younger, especially children younger than age 2 years
- Adults age 65 and over
- Pregnant women
- Residents of nursing homes and other chronic-care facilities.
- Persons with the following conditions:
 - chronic pulmonary (including asthma), cardiovascular (except hypertension), renal, hepatic, hematological (including sickle cell disease), or metabolic disorders (including diabetes);
 - immunosuppression, including that caused by medications or by HIV infection;
 - Any condition (e.g., cognitive dysfunction, spinal cord injuries, severe seizure disorders, or other neuromuscular disorders) that can compromise respiratory function or the handling of respiratory secretions or that can increase the risk of aspiration.
 - Obesity (appears to be a risk factor based on preliminary data)
- Persons younger than 19 years of age and receiving long-term aspirin therapy.

Health officials in areas that have already experienced significant amounts of disease with novel influenza A H1N1 (swine) virus note that the most common risk conditions for severe disease were asthma, pregnancy and age less than 2 years. Obesity may be an emerging risk factor for severe disease.

Clinicians should consider triaging patients over the phone and should also exercise prudent judgment in prescribing antiviral medicines for patients not meeting the above criteria (i.e., persons with mild influenza-like illness who are not at high risk for complications of influenza). These patients should be encouraged to stay home -until one day after their symptoms have resolved.

Treatment is for 5 days and, if possible, should be initiated within 48 hours of symptom onset.

Antiviral Post-Exposure Chemoprophylaxis for Novel Flu A H1N1 (Swine) Virus (7/6/09)

Antiviral chemoprophylaxis is *recommended* for:

1. Employees and residents of a nursing home or other long-term care facilities experiencing an outbreak of novel influenza A H1N1 (swine) virus.

Antiviral chemoprophylaxis can be *considered* for:

1. Health care workers who were not using personal protective equipment during close contact^A with a confirmed or probable case of novel influenza A H1N1 (swine) virus during the infectious period of that case (from 1 day before until 7 days after symptoms began).
2. Household or household-like institutional^B close contacts^A of a case of novel influenza A H1N1 (swine) virus, who are at high risk for complications of influenza^C.
3. Patients at high risk for complications who have had close contact^A with an infectious health care worker with novel influenza A H1N1 (swine) virus.

^A **Close contact** to an ill person is defined as living with an ill person, being within 3 feet of an ill person for an hour or longer or being in a setting where there was a high likelihood of contact with respiratory droplets and/or body fluids of an ill person. Examples of close contact include kissing or embracing, sharing eating or drinking utensils, physical examination, or any other contact between persons likely to result in exposure to respiratory droplets. Close contact typically does not include activities such as walking by an infected person or sitting across from a symptomatic patient in a waiting room or office.

^B **Institutions** with household-like living arrangements include group homes, jails, long-term care facilities.

^C See list of conditions that place people at **high risk for complications** on pages 3 and 4.

Duration of antiviral chemoprophylaxis *post-exposure* is 10 days after the last known exposure to an ill confirmed or probable case. Post-exposure prophylaxis is not necessary if the exposure occurred more than 7 days earlier.

Duration of antiviral chemoprophylaxis for outbreaks is for a minimum of two weeks. If new cases continue to appear, duration should be extended until 7 -10 days after illness onset of the last case.

Selection of Antiviral Drugs for Seasonal or Swine Influenza (7/6/09)

Selection of antiviral drugs for treatment or chemoprophylaxis of influenza depends upon:

- Which strains of influenza are circulating in the community;
- Strain-specific resistance to antiviral drugs; and
- The ability of laboratory testing to identify the specific strain infecting a patient

Circulating Strains. The dominant strain circulating in northern California for several weeks is novel influenza A H1N1 (swine) virus. Additional strains include seasonal influenza A H3N2 and influenza B. Seasonal influenza A H1N1 has only rarely been detected in northern California in the last several weeks.

Strain-Specific Resistance. In 2008-09, seasonal H1N1 influenza A was found to be resistant to oseltamivir, but sensitive to zanamivir and the adamantane drugs rimantadine and amantadine. Until very recently novel influenza A H1N1 (swine) virus was sensitive to both oseltamivir and zanamivir and resistant to the adamantanes. Within the last several weeks, 3 novel influenza A H1N1 (swine) virus isolates world-wide demonstrated resistance to oseltamivir – including one isolate from a patient from San Francisco. The adamantanes are not active against influenza B strains. See Table 1.

Table 1: Antiviral Resistance 2008-2009, US Influenza Isolates

	Zanamivir	Oseltamivir	Adamantanes
Influenza A H1N1 (Swine)	S	S (rare R)	R
Influenza A H1N1 (Seasonal)	S	R	S
Influenza A H3N2	S	S	R
Influenza B	S	S	Not active

S= Sensitive, R= Resistant

Laboratory Test Results. Distinguishing between seasonal influenza A subtypes H1N1 and H3N2, and novel influenza A H1N1 (swine) virus requires specialized techniques not available at most clinical laboratories. Thus clinicians typically must select an antiviral drug based on rapid diagnostic tests, or clinical presentation alone.

Recommendations. Table 2 provides recommendations based on results of rapid diagnostic testing and currently circulating strains. **All strains are susceptible to zanamivir, therefore, for empirical treatment, it is a practical single-drug option. Also, given that most strains and isolates currently circulating in northern California (novel influenza A H1N1 (swine) virus, influenza A H3N2 and influenza B) are susceptible to oseltamivir, it is also an appropriate empirical treatment.** For critically ill patients, clinicians may consider treatment with both a neuraminidase inhibitor (oseltamivir or zanamivir) and an adamantane (rimantadine or amantadine) in case the patient has seasonal influenza A H1N1. Clinicians may also consider double dosing oseltamivir and increased durations of treatment for critically ill patients and possibly for hospitalized obese patients. Information about circulating influenza strains may change over time. SFDPH will monitor this and update the medical community.

Table 2: Recommended antiviral drug(s) based on results of rapid diagnostic tests*

Rapid Diagnostic Test Result	Single Drug Option
Not done or negative, but clinical suspicion for flu	Zanamivir or Oseltamivir
Positive: Influenza A	Zanamivir or Oseltamivir
Positive: Cannot distinguish Influenza A vs. B	Zanamivir or Oseltamivir
Positive: Influenza B	Oseltamivir or Zanamivir

* Modified from CDC Interim Recommendations for the Selection of Antiviral Treatment Using Laboratory Test Results and Viral Surveillance Data, United States (www.cdc.gov/flu/professionals/antivirals/antiviraltable.htm).

Recommended doses of antiviral drugs for novel influenza A H1N1 (swine) virus infection in adults and children age 1 year and older are the same as those recommended for seasonal influenza. Oseltamivir recently received FDA approval for use in children less than 1 year of age under an Emergency Use Authorization.

Table 3: Recommended doses of antiviral drugs for adults and children¹

Agent	Treatment Dose X 5 days	Prophylaxis Dose X 10 days after last known exposure ²
Zanamivir (Adults; Children age \geq 5 years ³)	10 mg (two 5mg inhalations) BID	10 mg (two 5mg inhalations) QD
Oseltamivir (Adults; Children > 40 kg)	75 mg BID ⁴	75 mg QD
Oseltamivir (Children age \geq 12 months) \leq 15 kg	30 mg BID	30 mg QD
16-23 kg	45 mg BID	45 mg QD
24-40 kg	60 mg BID	60 mg QD
Oseltamivir (Children <12 months) Age 6-11 months	25 mg BID	25 mg QD
Age 3-5 months	20 mg BID	20 mg QD
Age <3 months	12 mg BID	Not recommended ⁵

¹ Modified from Table in CDC Interim Guidance on Antiviral Recommendations for Patients with Novel Influenza A (H1N1) Virus Infection and their Close Contacts (www.cdc.gov/h1n1flu/recommendations.htm).

² Duration of antiviral chemoprophylaxis for outbreaks is for a minimum of two weeks. If new cases continue to appear, duration may be extended.

³ Zanamivir is approved for treatment in children \geq 7 years old and for chemoprophylaxis in children \geq 5 years old

⁴ For severely or critically ill individuals, and hospitalized obese patients, clinicians should **consider** giving oseltamivir 150 mg BID for 8 – 10 days (see www.ama-assn.org/ama/pub/physician-resources/medical-science/infectious-diseases/topics-interest/swine-flu/swine-flu-treatment.shtml).

⁵ Due to limited data in this age group, Oseltamivir is not recommended for prophylaxis for children <3 months old unless the situation is judged critical. If deemed critical, the recommended dosage is 12 mg QD x 10 days after last exposure.

Infection Control Precautions for Healthcare Settings (Updated 10/13/09)

SFDPH joins with the CDC Healthcare Infection Control Practices Advisory Committee (HICPAC), the Society for Health Care Epidemiology of America (SHEA), the Infectious Disease Society of America (IDSA), the Association for Professionals in Infection Control (APIC), and the American College of Occupational and Environmental Medicine (OCEAM) in making the following recommendations:

All healthcare facilities should adopt standard and droplet precautions when caring for patients with influenza-like illness, seasonal flu, or suspected or confirmed H1N1 swine flu virus infection. Specifically:

- Instruct persons with influenza-like illness to stay at home until they have fully recovered;
- Provide surgical masks, tissues, a no-touch receptacle (foot-operated or open, plastic-lined wastebasket), and waterless hand sanitizer in all patient areas and entryways;
- Place signs at entrances and in all patient areas instructing all persons to cover their mouths/noses with a tissue when coughing or sneezing (or use an elbow rather than hands if a tissue is not available), to throw the tissue into the wastebasket after use, and to sanitize hands (by washing or using waterless hand sanitizer) after contact with secretions;
- Request all persons with fever or cough to wear a surgical mask;
- Isolate patients with influenza-like illness as soon as possible, ideally in a private exam room or at a distance of at least 3 feet from others;
- Staff entering the exam room of a patient with influenza-like illness should wear a surgical mask until an infectious cause of illness is ruled out and should wash their hands or use waterless hand sanitizer before and after interactions with the patient;

- For aerosol-generating procedures (e.g. bronchoscopy, intubation under emergent or controlled conditions, open airway suctioning and airway induction, cardiopulmonary resuscitation), wear a disposable fit-tested N95 respirator, eye protection (goggles or face shield), a clean, non-sterile, long-sleeved gown, and gloves. Consider using a negative pressure airborne infection isolation room, if possible, for elective aerosol-generating procedures.
- Collection of nasopharyngeal specimens for testing, closed suctioning of airway secretions and administration of nebulized medications are not considered aerosol-generating procedures, thus an N95 mask is not required.

See: www.cdc.gov/ncidod/dhqp/hicpac_h1n1.html (HICPAC). For a list of states and institutions following similar guidelines, see: www.shea-online.org/Assets/files/policy/H1N1_Grid_IL.pdf

Note: Respiratory Hygiene/Cough Etiquette is now a component of Standard Precautions. To limit disease transmission year round, health care providers should implement respiratory hygiene/cough etiquette and hand hygiene procedures in the health care setting and, when possible, in the community.

Note: Please refer to CAL-OSHA for employee health and safety regulations.

Protection from Pneumococcal Pneumonia (Updated 7/6/09)

At this time, the role of pneumococcal infections among severe cases of novel influenza A H1N1 is unclear. Influenza, however, predisposes individuals to bacterial community-acquired pneumonia and during the 20th century influenza pandemics, secondary bacterial pneumonia was an important cause of illness and death. In that regard, all people who have existing indications for pneumococcal polysaccharide vaccine (PPSV23) should continue to be vaccinated according to current ACIP recommendations (<http://www.cdc.gov/vaccines/recs/provisional/downloads/pneumo-Oct-2008-508.pdf>). Emphasis should be placed on vaccinating those less than 65 years who have established high-risk conditions (http://www.cdc.gov/h1n1flu/guidance/ppsv_h1n1.htm), because coverage among this group is low and because people in this group appear to be overrepresented among severe cases of novel influenza A (H1N1) infection.

Information for International Travelers (updated 6/24/09)

Human cases of novel influenza A H1N1 (swine) virus have been identified in dozens of countries around the world. As stated above, on June 11, 2009 the WHO raised the worldwide pandemic alert level to Phase 6, indicating global spread and ongoing community level outbreaks in multiple parts of the world.

In the Southern Hemisphere, the normal flu season typically occurs during April-September, and some countries in the Southern Hemisphere are reporting increasing numbers of cases of novel influenza A H1N1 (swine) virus.

CDC recommends that those at high risk for complications from any form of influenza should discuss travel plans with their health care provider, and consider the risks and benefits of travel in the context of the novel influenza A H1N1 (swine) virus situation in their destination and the available health care options in the area.

There are at present no specific recommendations for antiviral prophylaxis in travelers. CDC removed its recommendation to avoid travel to Mexico, and does not recommend avoiding travel to any country due to novel influenza A H1N1 (swine) virus. (See <http://www.cdc.gov/travel/content/novel-h1n1-flu.aspx>.)

Adverse Events from Influenza Antiviral Medications (4/29/09)

For information about influenza antiviral medications, including contraindications and adverse effects, go to

- www.cdc.gov/flu/professionals/antivirals/side-effects.htm
- www.cdc.gov/mmwr/preview/mmwrhtml/rr5707a1.htm

Please report adverse events from influenza antivirals to the FDA: www.fda.gov/medwatch

Solicitation for Sentinel Providers for the Influenza Surveillance Program (6/24/09)

Primary care providers (physicians, nurse practitioners, and physician assistants) are invited to enroll as sentinel physicians in SF. The California Sentinel Provider Influenza Surveillance Program conducts surveillance for influenza-like illness (ILI) in the outpatient setting. Sentinel Providers report the number of patients seen with ILI and the total number of patients seen for any reason on a weekly basis to the CDC by fax or internet. Specimen collection materials and shipping to the California Department of Public Health are provided at no cost to the provider. Testing of specimens from Sentinel Providers is prioritized. Results are sent to participating providers, who also receive weekly updates on state and national influenza activity. If interested in becoming a Sentinel Provider, contact Melissa Dahlke at 510-620-3494 or melissa.dahlke@cdph.ca.gov.

Local Resources (6/24/09)

SFDPH website:

- Swine flu page: www.sfdcp.org/H1N1.html

Phone contact:

- Hospital-based clinicians should call their hospital's Swine Flu Point of Contact. Most hospitals designated an Infection Control Professional as their Swine Flu Point of Contact.
- For more urgent issues clinicians may call 415-554-2830.
- The public can call 311 for basic information about swine flu.