Texas and swine influenza A (H1N1)
Texas is experiencing an outbreak of a novel influenza virus, swine influenza A (H1N1). Individual cases have exhibited a spectrum of severity of disease, including one fatality, with the largest proportion experiencing mild to moderate illness. To date, most Texas patients with confirmed cases are young; almost 90% are under 18 years of age. The symptoms most commonly reported have been fever (100% and a median of 102.5), cough (95%), and sore throat (61%), and about half have reported nausea, vomiting, or diarrhea. The investigation into the extent and nature of the disease continues across the state. Treating laboratory and clinically diagnosed patients is a major focus now, with priority for antiviral use given to those at highest risk of complications or severe disease.

There is no vaccine at this time for swine flu A (H1N1), so non-pharmaceutical interventions and antivirals are the main weapons against the disease.

### Priority Groups for Antiviral Use

#### Treatment for 5 Days
- Confirmed or Probable Cases of swine flu at high risk for complications of influenza
- Hospitalized patients with influenza-like illness (ILI) or respiratory syndromes consistent with influenza
- ILI patients in an outpatient setting who are at high risk for complications of influenza

#### Post-Exposure Prophylaxis for 10 days
- Household close contacts who are at high risk for complications of influenza
- Health care workers, public health workers or first responders, who were not using appropriate personal protective equipment (PPE) at the time of exposure

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. There are insufficient data available at this point to determine who is at higher risk for complications of the specific swine-origin influenza A (H1N1) virus itself.

### Groups at higher risk for seasonal influenza complications include:
- Children less than 5 years old; infants under 12 months are particularly vulnerable;
- Pregnant women;
- Adults and children who have chronic pulmonary, cardiovascular, hepatic, hematological, neurologic, neuromuscular, or metabolic disorders, including asthma and diabetes;
- Adults and children who have immunodeficiency or -suppression (including immunosuppression caused by medications or by HIV);
- Persons aged 50 years or older, particularly those over 65;
- Children and adolescents (aged 6 months–18 years) who are receiving long-term aspirin therapy and who might be at risk for experiencing Reye syndrome after influenza virus infection;
- Residents of nursing homes and other long-term facilities.
Antiviral drug supply

Antiviral drugs complement nonpharmaceutical interventions such as good hand hygiene, respiratory etiquette, and social distancing, which are the first line of defense in curtailing the spread of influenza. The swine-origin influenza virus is susceptible to both oseltamivir and zanamivir. It is resistant to amantadine and rimantadine. Texas has oseltamivir and zanamivir in both private and government sectors.

The principal source for antivirals will be the usual healthcare sector and chain of supply. Texas and the federal government also purchased limited supplies of antiviral drugs (oseltamivir/Tamiflu and zanamivir/Relenza), earmarked for specific use during an outbreak of novel influenza. These are considered a backup supply of antivirals when the antivirals are no longer available through normal supply chains (e.g., community pharmacies for prescriptions, distributors for hospitals). Government supplies will also be used to support critical infrastructure such as healthcare and public safety. Government supplies also serve as a safety net for those who are uninsured or underinsured. Normal supply chains will also continue as sources of antivirals for citizens and health care facilities.

Since the cache for Texas is small compared to the Texas population, the Texas Department of State Health Services (DSHS), in conjunction with a group of stakeholders, developed guidance and recommendations for use of these government supplies [www.dshs.state.tx.us/swineflu](http://www.dshs.state.tx.us/swineflu) and is implementing a distribution process for those antivirals. Usage of government supplies will be tracked, only at the pharmacy level, and not by individual clinicians.

Texas physicians are critical partners in using these antiviral supplies most wisely so that they will last through the current situation and still have some available for another wave of swine flu A (H1N1) disease or severe infections with another novel virus. Treatment should be prioritized to persons who are at higher risk of complications from influenza disease or have severe illness and to those who support public health and safety. Chemoprophylaxis also should be prioritized to those groups. Those individual decisions about treatment will be based on the physician’s clinical judgment and knowledge of the current situation in that community with respect to swine influenza A (H1N1) and other respiratory illness, as well as the individual clinical situation.

Transmission

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 may be common. All respiratory secretions and bodily fluids (diarrheal stool) of swine-origin influenza A (H1N1) cases should be considered potentially infectious. Transmission of the specific swine-origin influenza A (H1N1) virus is being studied as part of the ongoing outbreak investigation.

Incubation period and infectious period

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

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 is widespread confirmed swine-origin influenza (Updated information about areas with confirmed human cases of swine-origin influenza A (H1N1) can be found at http://www.cdc.gov/h1n1flu/investigation.htm.) or
• Reside in a community where there are widespread 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 occurred in the past. 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.

Guidance for treatment and care for children is available on the CDC website at: http://www.cdc.gov/h1n1flu/childrentreatment.htm.

Children and adolescents should not receive any aspirin or aspirin or aspirin derivative products. Oseltamivir is now approved for treatment of infants under 1 year of age.

Guidance for treatment and care of pregnant women is is available on the CDC website at: http://www.cdc.gov/h1n1flu/clinician_pregnant.htm.

Pregnancy is not a contraindication for use of antivirals for treatment or prophylaxis. Pregnancy is a state of relative immuno suppression, and pregnant women can experience severe disease with influenza.

Guidance for treatment and care for adults and adolescents with HIV infection is available on the CDC website at: http://www.cdc.gov/h1n1flu/guidance_HIV.htm.

Interim general guidance on antiviral treatment for swine-origin influenza A (H1N1) can be found at: http://www.cdc.gov/h1n1flu/guidance/.

For those for whom pneumococcal or Tdap vaccine is recommended, vaccination should be updated as needed to aid in preventing co-infection.

Providers should continue to use seasonal vaccine according to usual recommendations until their supplies are exhausted or expired, and strongly encourage patients to be vaccinated in the fall.
Additional Therapy

Additional therapy such as antibacterial agents, should be used at the discretion of the clinicians given the patient’s 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.

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

Clinicians should contact their local or regional health department departments to report suspected cases of swine-origin influenza A (H1N1) virus infection. Public health staff will give guidance on data and laboratory testing for their community.

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 specimen, 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. Texas guidance on *Laboratory Testing Protocols* for patients with suspected swine-origin influenza A (H1N1) virus infection can be found at: [www.dshs.state.tx.us/swineflu](http://www.dshs.state.tx.us/swineflu).

All hospitalized patients with influenza-like illness should be reported and tested.

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/h1n1flu/guidelines_infection_control.htm](http://www.cdc.gov/h1n1flu/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/h1n1flu/recommendations.htm](http://www.cdc.gov/h1n1flu/recommendations.htm).

Additional Information

Additional information on swine-origin influenza can be found at: [http://www.cdc.gov/h1n1flu/](http://www.cdc.gov/h1n1flu/).
Algorithm to assist in decisions on testing and treatment for H1N1 (swine flu) Virus in communities with Fewer than 5 confirmed Cases

Patient presents with
- Fever >37.8°C (100°F), and cough and/or sore throat = ILI or
- Sepsis-like syndrome\(^1\) or
- Severe illness with lower respiratory tract infections or pneumonia

Yes

Implement the appropriate infection control measures\(^2\)

- Patient traveled to Mexico or US community with widespread confirmed H1N1 (swine flu) cases, or is a close contact of a confirmed or probable case (A unsubtypable), or
- Patient’s clinical condition indicates need for hospitalization

No

Patient should:
- stay home until symptoms resolve
- use hand, respiratory, and cough hygiene
- call if symptoms worsen

No influenza testing recommended.
Additional workup and follow up as clinically indicated

Treat patients at high risk of complications with antivirals if clinical index of suspicion is high for flu.
Rapid test or sample for PCR
Treat others based on local clinical experience
Consider additional workup for other respiratory conditions and co-infections if warranted.
Patient should:
- stay home until symptoms resolve
- use hand, respiratory, and cough hygiene
- call if symptoms worsen

Obtain any of the following: nasopharyngeal swab; nasal aspirate; nasal swab plus throat swab; or nasal wash\(^3\)
- Store in refrigerator while awaiting transport (do not freeze)
- Send to state public health laboratory for RT-PCR testing\(^4\)

Recommend early antiviral treatment with oseltamivir or zanamivir if patient is severely ill or at high risk for complications\(^5\)
- Use clinical judgment to decide whether additional antibacterial therapy is needed\(^6\)

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1. As with seasonal influenza, infants, adults > 64 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.
4. 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 information on laboratory testing protocols, please see: http://www.dshs.state.tx.us/swineflu/default.shtm.
5. Interim guidance for antiviral use can be found at: http://www.cdc.gov/swineflu/recommendations.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 Communities 5 or more confirmed Cases

Patient presents with
- Fever >37.8°C (100°F), and cough and/or sore throat = ILI or
- Sepsis-like syndrome\(^1\) or
- Severe illness with lower respiratory track infections or pneumonia

No influenza testing recommended. Additional workup and follow up as clinically indicated

Consider additional workup for other respiratory conditions and co-infections if warranted.
Patient should:
- stay home until symptoms resolve
- use hand, respiratory, and cough hygiene
- call if symptoms worsen
Treat patients at high risk of complications with antivirals if clinical index of suspicion is high for flu.
Treat others based on local clinical experience.

Does patient’s clinical condition indicate need for hospitalization?

Obtain any of the following: nasopharyngeal swab; nasal aspirate; nasal swab plus throat swab; or nasal wash\(^3\)
- Store in refrigerator while awaiting transport (do not freeze)
- Send to state public health laboratory for RT-PCR testing\(^4\)
- Recommend early antiviral treatment with oseltamivir or zanamivir if patient is severely ill or at high risk for complications\(^5\)
- Use clinical judgment to decide whether additional antibacterial therapy is needed\(^6\)

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