

CDC Criteria for Swine Flu Treatment and Prophylaxis with oseltamivir (Tamiflu) and zanamivir (Relenza)

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Case Definitions for Infection with Swine-origin Influenza A (H1N1) Virus (S-OIV)

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

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 are 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.

Acute respiratory illness is defined as recent onset of at least two of the following: rhinorrhea or nasal congestion, sore throat, cough (with or without fever or feverishness)

High-risk groups: A person who is at high-risk for complications of swine influenza A (H1N1) virus infection is defined as the same for seasonal influenza (see [MMWR: Prevention and Control of Influenza: Recommendations of the Advisory Committee on Immunization Practices \(ACIP\), 2008](#)).

Special Considerations for Children

Aspirin or aspirin-containing products (e.g. bismuth subsalicylate – Pepto Bismol) should not be administered to any confirmed or suspected ill case of swine influenza A (H1N1) virus infection aged 18 years old and younger due to the risk of Reye syndrome. For relief of fever, other anti-pyretic medications are recommended such as acetaminophen or non steroidal anti-inflammatory drugs.

Antiviral Treatment

Confirmed, Probable and Suspected Cases of Swine-origin Influenza A (H1N1) Virus Infection

Recommendations for use of antivirals may change as data on antiviral effectiveness, clinical spectrum of illness, adverse events from antiviral use, and antiviral susceptibility data become available.

Antiviral treatment should be considered for confirmed, probable or suspected cases of swine-origin influenza A (H1N1) virus infection. Treatment of hospitalized patients and patients at higher risk for influenza complications should be prioritized.

Only RT-PCR or viral culture can confirm infection with swine-origin influenza A (H1N1) virus. The test performance of rapid antigen tests and immunofluorescence tests for detection of swine-origin influenza A (H1N1) virus is unknown. Persons who might have swine-origin influenza A (H1N1) virus and who test positive for influenza A using one of these tests should have confirmatory RT-PCR or viral culture testing to confirm the presence of swine-origin influenza A (H1N1) virus. A negative rapid antigen or immunofluorescence test cannot be used to rule out swine-origin influenza A (H1N1) virus infection.

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. Recommendations for use of antivirals may change as data on antiviral susceptibilities and effectiveness become available. Antiviral doses recommended for treatment of swine-origin influenza A (H1N1) virus infection in adults or children 1 year of age or older are the same as those recommended for seasonal influenza ([Table 1](#)). 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 ([Table 2](#)).

Note: Areas that continue to have seasonal influenza activity, especially those with circulation of oseltamivir-resistant human A (H1N1) viruses, might prefer to use either zanamivir or a combination of oseltamivir and rimantadine or amantadine to provide adequate empiric treatment or chemoprophylaxis for patients who might have human influenza A (H1N1) infection.

Antiviral Chemoprophylaxis

For antiviral chemoprophylaxis of swine-origin influenza A (H1N1) virus infection, either oseltamivir or zanamivir are recommended ([Table 1](#)). Duration of antiviral chemoprophylaxis *post-exposure* is 10 days after the last known exposure to an ill confirmed case of swine-origin influenza A (H1N1) virus infection. 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 ([Table 3](#)).

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. Health care workers or public health workers who were not using appropriate personal protective equipment during close contact with an ill confirmed, probable, or suspect case of swine-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 the following:

1. Household close contacts who are at high-risk for complications of influenza (e.g., persons with certain chronic medical conditions, persons 65 years or older, children younger than 5 years old, and pregnant women) of a suspected case.
2. Children attending school or daycare who are at high-risk for complications of influenza (children with certain chronic medical conditions) 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 (e.g., persons with certain chronic medical conditions, persons 65 or older, and pregnant women) who are working in an area of the healthcare facility that contains patients with confirmed swine-origin influenza A (H1N1) cases, or who is caring for patients with any acute febrile respiratory illness.
4. Travelers to Mexico 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). (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 (e.g., persons with certain chronic medical conditions, persons 65 or older, children younger than 5 years old, and pregnant women) and who are working in areas with confirmed cases of swine-origin influenza A (H1N1) virus infection.

Table 1. Swine-origin influenza antiviral medication dosing recommendations.

(Table extracted from [IDSA guidelines for seasonal influenza](#).)

Agent, group	Treatment	Chemoprophylaxis
Oseltamivir		
Adults	75 mg capsule twice per day for 5 days	75 mg capsule once per day

Children (age, 12 months or older), weight:	15 kg or less	60 mg per day divided into 2 doses	30 mg once per day
	15–23 kg	90 mg per day divided into 2 doses	45 mg once per day
	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	Two 5 mg inhalations (10 mg total) once per day

	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)

Children Under 1 Year of Age

Children under one year of age are at high risk for complications from seasonal human influenza virus infections. The characteristics of human infections with swine-origin H1N1 viruses are still being studied, and it is not known whether infants are at higher risk for complications associated with swine-origin H1N1 infection compared to older children and adults. Limited safety data on the use of oseltamivir (or zanamivir) are available from children less than one year of age, and oseltamivir is not licensed for use in children less than 1 year of age. Available data come from use of oseltamivir for treatment of seasonal influenza. These data suggest that severe adverse events are rare, and the Infectious Diseases Society of America recently noted, with regard to use of oseltamivir in children younger than 1 year old with seasonal influenza, that "...limited retrospective data on the safety and efficacy of oseltamivir in this young age group have not demonstrated age-specific drug-attributable toxicities to date." (See [IDSA guidelines for seasonal influenza](#).)

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.

Table 2. 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

Table 3. Dosing recommendations for antiviral chemoprophylaxis of children younger than 1 year using oseltamivir.

Age	Recommended prophylaxis dose for 10 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
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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. See [additional information on oseltamivir for this age group](#).

Pregnant Women

Oseltamivir and zanamivir are "Pregnancy Category C" medications, indicating that no clinical studies have been conducted to assess the safety of these medications for pregnant women. Because of the unknown effects of influenza antiviral drugs on pregnant women and their fetuses, oseltamivir or zanamivir should be used during pregnancy only if the potential benefit justifies the potential risk to the embryo or fetus; the manufacturers' package inserts should be consulted. However, no adverse effects have been reported among women who received oseltamivir or zanamivir during pregnancy or among infants born to women who have received oseltamivir or zanamivir. Pregnancy should not be considered a contraindication to oseltamivir or zanamivir use. Because of its systemic activity, oseltamivir is preferred for treatment of pregnant women. The drug of choice for prophylaxis is less clear. Zanamivir may be preferable because of its limited systemic absorption; however, respiratory complications that may be associated with zanamivir because of its inhaled route of administration need to be considered, especially in women at risk for respiratory problems.