

INQUIRY



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The H1N1 "Swine" Flu: What Is It? Can We Treat It?

By Marketa Marvanova, Pharm.D., Ph.D.

Swine flu is known most currently as H1N1 flu and has also been referred to as swine influenza A or H1N1 strain (A/H1N1). This viral infection originated in pigs as a combination of viral strains found in human, swine, and avian influenza virus strains. Interestingly, pigs can catch avian flu, human flu, and swine flu. In the case of the A/H1N1 viral strain, a pig had to have been infected with three different kinds of influenza strains to generate this particular virus. The current H1N1 flu is a novel strain with genes originating from North American avian-flu viruses, genes from a human-flu virus, and several segments from European and Asian pig-flu viruses. This newly emerged strain can spread person to person and has surface antigens unknown to our immune systems.

Influenza type A (flu type A) is a virus with a segmented RNA genome capable of causing upper respiratory track infection in humans, pigs, birds and other mammals. Based on surface antigens hemagglutinin (H) and neuraminidase (N), we can distinguish strains of type A influenza virus. Some strains are species specific (e.g., humans, birds or pigs); they only infect and spread within one species. New viral strains arise through a process called antigenic shift, or reassortment, when two or more different viral strains combine and exchange genes. Antigenic shift should not be confused with antigenic drift which is a very common process which refers to minor changes in influenza surface antigens and is the cause for annual vaccination against influenza. Antigenic shift occurs when a single cell is infected by at least two different flu virus strains and some of their genes are exchanged during replication within the cell. New virus strains that originate through antigenic shift are can cause pandemics (world spread infection) because our immune systems have not previously encountered them, thus we lack antibodies to fight them once infected.

H1N1 flu symptoms are similar to seasonal influenza symptoms associated including: fever over 100 degrees, dry cough, sore throat, body aches, chills and fatigue. Additional symptoms associated with H1N1 flu include vomiting and diarrhea. The incubation period is one to three days, and infected persons are ill for three to five days. Currently, H1N1 flu is sensitive to the prescription antiviral medications oseltamivir (Tamiflu®) and zanamivir (Relenza®). These agents block the spread of the new viral particles in the body decreasing severity of disease and shortening durations of infection by 1-2 days. Medication therapy must start within 48 hours of flu-like symptom onset; when taken later than 48 hours after symptom presentation, these agents are ineffective.

References Available Upon Request

Pandemic Prevention and H1N1 "Swine" Flu

By Salvatore Giorgianni, Pharm.D.

Because influenza is most infectious during early stages of illness, especially following the onset of coughing and sneezing, much influenza transmission during a pandemic is likely to occur in non-healthcare settings, such as schools, public gatherings, and households. Influenza is thought to be transmitted from person to person by close contact (within 6 feet) via exposure to respiratory secretions. It is unclear to what extent inhalation of small particles or direct exposure to larger droplets contributes to this close-range transmission of influenza viruses. Experience with influenza viruses transmitted from person to person in institutional settings indicates that most transmission occurs over short distances.

Community-based interventions include:

- isolation and treatment with influenza antiviral medications of persons with confirmed or probable pandemic influenza;
- voluntary home quarantine of members of households with confirmed or probable influenza cases;

- dismissal of students from schools and school-based activities, and closure of childcare programs coupled with social distancing in the community; and
- social distancing of adults in the community and in the workplace.
- social distancing strategies include avoiding crowds, individuals with an influenza-like illness, and other situations that increase the risk of exposure to someone who may be infectious. If absolutely necessary to be in a crowded setting, the time spent there should be as short as possible.

Vaccination is generally considered the most effective way to prevent seasonal influenza. However, unlike the typical situation with seasonal influenza, an effective vaccine may not be available for all people early in a pandemic, and as with the current H1N1 flu outbreak. Current pandemic preparedness efforts include the coordinated use of nonpharmaceutical interventions to help reduce influenza spread. While antiviral agents are available to treat H1N1 flu, these agents are currently in limited supply in the regular community distribution systems. The Federal Government has supplies of these agents; however their distribution is strictly controlled by emergency protocols and government procedures.

Preventive measures remain the most important, readily implementable, and reliable measures to be recommended and utilized.

- Aggressive, frequent soap and water hand washing, augmented with intermittent use of non-soap based hand sanitizers is the most effective method.
- Use of protective gloves in areas of contamination or in handling materials is also recommended.
- Face masks (surgical grade) and respirators, if used correctly, may help to prevent some exposure in a crowded setting; however, they should be used along with other prevention interventions, such as cough etiquette and hand hygiene. There is very limited information on the use of facemasks or respirators for the control of pandemic influenza in community settings. Thus, it is difficult to assess their potential effectiveness in controlling influenza in these settings.

Complete guidance from CDC can be found at <http://www.cdc.gov/swineflu/recommendations.htm>.

References Available Upon Request

CDC Recommendations – April 30, 2009*

Avoid the Source

- Avoid contact with ill individuals and groups. Crowded settings should be avoided to the greatest extent possible during a pandemic.
- Some individuals, such as pregnant women, persons with underlying conditions such as cardiopulmonary disease or immunodeficiency, normally healthy children or young adults, are at increased risk for severe illness.

Contain the Source

- Individuals who have respiratory symptoms should stay at home and wear a facemask to contain respiratory secretions.
- Screen individuals as they enter a gathering to exclude anyone with a cough or fever, or anyone who has been exposed to an ill household member. No approach is foolproof.

Prevent/Limit Exposures

- If a gathering is unavoidable, crowding should be minimized and every effort should be made to encourage cough etiquette and hand hygiene. Wearing facemask or respirator should be considered.
- Facemasks do not form a tight seal on the face and do filter out small particles, but are useful in blocking large infectious secretions. Facemasks and respirators may be beneficial in discouraging inadvertently touching nose or mouth with unwashed hands and thus may help prevent infection.

* Once a pandemic is under way and more is known about the characteristics these recommendations may be modified.

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