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This is an official
CDC Health Advisory

**Three Reports of Oseltamivir Resistant
Novel Influenza A (H1N1) Viruses**

Summary

On July 7, 2009 the World Health Organization announced the identification of a third person with oseltamivir resistant novel H1N1 virus infection.

All three people fully recovered after uncomplicated illnesses and did not have contact with each other. Two of the three people are reported to have developed illness while taking oseltamivir preventatively after an exposure to a close contact with novel influenza A (H1N1). The third person had no known exposure to oseltamivir.

Results from ongoing testing of novel influenza A (H1N1) viruses indicate that oseltamivir resistance remains rare.

The interim recommendations for the use of antiviral medications for chemoprophylaxis and treatment have not been changed <http://www.cdc.gov/h1n1flu/recommendations.htm>.

Judicious use of antiviral medications is recommended to reduce the possibilities of the development and spread of antiviral resistant influenza viruses.

Use of zanamivir or oseltamivir should be focused on treatment of persons with suspected novel H1N1 influenza who are 1) hospitalized or 2) at higher risk for complications due to influenza, even if hospitalization is not required.

Personal hygiene practices such as hand washing and practices to prevent the spread of an ill person's respiratory secretions should continue during treatment because an infected person may continue to shed virus in respiratory secretions while on therapy.

Use of oseltamivir for chemoprophylaxis should be reserved for certain specific situations, such as when a person at high risk for influenza-related complications is exposed to a person with influenza.

Monitoring for antiviral resistance is ongoing and clinicians and state health departments should continue to follow state and national guidance for submission and testing of clinical specimens from persons with suspected novel influenza A (H1N1) virus infection.

More information will be provided as it becomes available.

Background

Since the first cases of novel influenza A (H1N1) virus were detected in mid-April 2009, more than 94,500 people with confirmed infection have been reported worldwide.

Until recently, all novel H1N1 viruses tested have been susceptible to oseltamivir and zanamivir (neuraminidase inhibitors), and resistant to amantadine and rimantadine (M-2 channel blockers, or adamantanes).

The World Health Organization recently announced the identification of three persons with oseltamivir-resistant novel influenza A (H1N1) virus infection; all viruses had the same mutation that confers resistance, H274Y (H275Y in N1 numbering), in the neuraminidase protein.

- On July 3, The Hong Kong Department of Health reported a resistant virus isolated from a 16 year-old girl who had a fever upon arrival at the Hong Kong International airport on June 11, 2009. Her symptoms began prior to boarding the plane in San Francisco, California. The patient had not taken antiviral agents and reported no illness among close contacts.
- On July 2, 2009, a person infected with an oseltamivir-resistant novel influenza A (H1N1) virus was reported from Japan from an illness on May 15, 2009. This patient also became ill while receiving oseltamivir for chemoprophylaxis.
- On June 29, 2009, the National Influenza Center in Denmark reported an oseltamivir-resistant novel influenza A (H1N1) virus from an unknown date. The virus was isolated from a patient who became ill while taking a chemoprophylaxis dose of oseltamivir to prevent influenza infection after exposure to an ill person.

Guidance for the use of antiviral agents for novel influenza A (H1N1) infection has not changed and is available at: <http://www.cdc.gov/h1n1flu/recommendations.htm>.

The use of antiviral agents for treatment should be prioritized; zanamivir or oseltamivir are recommended for the treatment of persons with suspected novel H1N1 influenza who are 1) hospitalized, or 2) at higher risk for complications due to influenza, even if hospitalization is not required.

Initiation of antiviral therapy should be as early as possible, preferably within 48 hours since symptom onset; however antiviral therapy for hospitalized persons is recommended even if it is not possible to begin therapy until more than 48 hours after symptoms began.

Despite treatment with antiviral agents, including treatment with the neuraminidase inhibitors, patients may continue to shed influenza virus and some persons may shed up to four or more days after beginning therapy. Therefore, patients should continue good hand washing and respiratory hygiene practices during the entire period on therapy to prevent the transmission of virus to close contacts.

Antiviral agents to prevent infection with novel influenza A (H1N1) virus should be used judiciously.

Most people who are infected with novel influenza A (H1N1) virus have had a self limited illness and have recovered without the need for antiviral medications.

Inappropriate use of oseltamivir for chemoprophylaxis could contribute to the development of oseltamivir resistance among novel influenza A (H1N1) viruses and the circulation of resistant viruses in the community.

Use of antiviral agents for chemoprophylaxis can be considered for persons at higher risk from complications due to influenza, or for health care workers with an exposure to influenza due to inadequate personal protective equipment.

Appropriate administrative controls (e.g. having health care personnel stay home from work when ill, and triaging for identification of potentially infectious patients) and personal protective equipment should be used to reduce the need for post-exposure chemoprophylaxis among health care workers.

Antiviral agents are discouraged for prevention of illness in healthy children or adults based on potential exposures in the community, school, camp or other settings.

In addition, there is no safety data regarding long term or frequent use of antiviral agents in children, and limited data for healthy adults.

Efforts to monitor for antiviral resistance among novel influenza A (H1N1) viruses are ongoing in the United States and internationally, but detection of oseltamivir resistance among novel influenza A (H1N1) viruses has been rare to date.

Testing for Novel influenza A (H1N1)

Clinicians and clinical laboratories should continue to test patients for novel influenza A (H1N1) infection, especially hospitalized persons with suspect novel H1N1 influenza, and submit clinical specimens or viruses to the local public health laboratory as described by each state health department.

TABLE: Persons at Higher Risk for Complications of Novel Influenza A (H1N1) Virus Infection

- Children younger than 5 years old. The risk for severe complications from seasonal influenza is highest among children younger than 2 years old.
- Adults 65 years of age and older.
- Persons with the following conditions:
 - o Chronic pulmonary (including asthma), cardiovascular (except hypertension), renal, hepatic, hematological (including sickle cell disease), neurologic, neuromuscular, or metabolic disorders (including diabetes mellitus);
 - o Immunosuppression, including that caused by medications or by HIV;
 - o Pregnant women;
 - o Persons younger than 19 years of age who are receiving long-term aspirin therapy;
 - o Residents of nursing homes and other chronic-care facilities.

SC DHEC continues to recommend testing for Novel Influenza A (H1N1) by Reverse-Transcriptase Polymerase Chain Reaction (RT-PCR) in a number of settings. However, it is essential to prioritize for testing for surveillance for novel influenza A (H1N1). Currently, testing for novel influenza A (H1N1) by RT-PCR by the DHEC Bureau of Laboratories is only done for the following priority groups:

Priority groups for testing for novel influenza A (H1N1) include:

- all persons admitted to hospitals because of ILI;
- patients who are part of outbreaks or clusters of cases -- where obtaining a reasonable number of specimens (e.g. 5) should generally be sufficient to ascertain the virologic cause of the outbreak;
- selected individuals with ILI from Outpatient Influenza-Like Illness Network (ILINet) participating providers, and,
- persons who may be considered of special interest because of carefully considered clinical, epidemiologic or public health reasons.

Requests for testing for novel influenza A (H1N1) should be coordinated with the Regional Public Health Department epidemiology staff. Contact information available below.

State laboratories should continue to test for novel influenza A (H1N1) and seasonal influenza viruses and follow guidance issued by CDC for surveillance.

Additional Information

- Reports on antiviral resistance testing in the United States will be available at: <http://www.cdc.gov/flu/weekly>.
- For more information, please see the CDC website: <http://www.cdc.gov/h1n1flu/recommendations.htm>
- Additional information from SC DHEC regarding surveillance and response to novel influenza A (H1N1) is available at: <http://www.scdhec.gov/flu/swine-flu.htm>

DHEC Contact Information for Reportable Diseases and Reporting Requirements

Reporting of outbreaks/clusters of cases of influenza is consistent with South Carolina Law requiring the reporting of diseases and conditions to your state or local public health department. (State Law # 44-29-10 and Regulation # 61-20) as per the DHEC 2004 List of Reportable Conditions available at: http://www.scdhec.gov/health/disease/docs/reportable_conditions.pdf

Federal HIPAA legislation allows disclosure of protected health information, without consent of the individual, to public health authorities to collect and receive such information for the purpose of preventing or controlling disease. (HIPAA 45 CFR §164.512).

Regional Public Health Offices – 2009

Mail or call reports to the Epidemiology Office in each Public Health Region.

Region 1

Anderson, Oconee

220 McGee Road
Anderson, SC 29625
Phone: (864) 260-4358
Fax: (864) 260-5623
Nights / Weekends: 1-866-298-4442

Abbeville, Edgefield, Greenwood, Laurens, McCormick, Saluda

736 S. Main Street
Greenwood, SC 29646
Phone: 1-888-218-5475
Fax: (864) 942-3690
Nights / Weekends: 1-800-420-1915

Region 2

Greenville, Pickens

PO Box 2507
200 University Ridge
Greenville, SC 29602-2507
Phone: (864) 282-4139
Fax: (864) 282-4373
Nights / Weekends: 1-800-993-1186

Cherokee, Spartanburg, Union

PO Box 4217
51 E. Wood Street
Spartanburg, SC 29305-4217
Phone: (864) 596-2227, x- 210
Fax: (864) 596-3443
Nights / Weekends: 1-800-993-1186

Region 3

Chester, Lancaster, York

PO Box 817
833 Pageland Highway
Lancaster, SC 29721
Phone: (803) 286-9948
Fax: (803) 286-5418
Nights / Weekends: 1-866-867-3886

Region 3 (continued)

Fairfield, Lexington, Newberry, Richland

2000 Hampton Street
Columbia, SC 29204
Phone: (803) 576-2749
Fax: (803) 576-2993
Nights / Weekends: 1-888-554-9915

Region 4

Clarendon, Kershaw, Lee, Sumter

PO Box 1628
105 North Magnolia Street
Sumter, SC 29150
Phone: (803) 773-5511
Fax: (803) 775-9941
Nights/Weekends: 1-877-831-4647

Chesterfield, Darlington, Dillon,

Florence, Marlboro, Marion

145 E. Cheves Street
Florence, SC 29506
Phone: (843) 661-4830
Fax: (843) 661-4859
Nights / Weekends: (843) 660-8145

Region 5

Bamberg, Calhoun, Orangeburg

PO Box 1126
1550 Carolina Avenue
Orangeburg, SC 29116
Phone: (803) 533-7199
Fax: (803) 533-7134
Nights / Weekends: (803) 954-8513

Aiken, Allendale, Barnwell

1680 Richland Avenue, W. Suite 40
Aiken, SC 29801
Phone: (803) 642-1618
Fax: (803) 643-8386
Nights / Weekends: (803) 827-8668 or
1-800-614-1519

Region 6

Georgetown, Horry, Williamsburg

1931 Industrial Park Road
Conway, SC 29526-5482
Phone: (843) 915-8804
Fax: (843) 365-0085
Nights / Weekends: (843) 381-6710

Region 7

Berkeley, Charleston, Dorchester

4050 Bridge View Drive, Suite 600
N. Charleston, SC 29405
Phone: (843) 746-3860
Fax: (843) 746-3851
Nights / Weekends: (843) 219-8470

Region 8

Beaufort, Colleton, Hampton, Jasper

219 S. Lemacks Street
Walterboro, SC 29488
Phone: (843) 549-1516, x-214
Fax: (843) 549-6845
Nights / Weekends: 1-800-614-4698

DHEC Bureau of Disease Control

Division of Acute Disease Epidemiology

1751 Calhoun Street
Box 101106
Columbia, SC 29211
Phone: (803) 898-0861
Fax: (803) 898-0897
Nights / Weekends: 1-888-847-0902



www.scdhec.gov

Categories of Health Alert messages:

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.