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Update 2: Outbreaks of Severe Acute Respiratory Syndrome (SARS) in Asia: Information and Recommendations for Health Care Providers

Please distribute to Emergency Department, Infectious Disease Physicians, Internists, Pulmonologists, Pediatricians, Family Practice Physicians, Infection Control Staff, Outpatient Clinic Staff, and Laboratory Director

The New York State Department of Health (NYSDOH) is providing this update to hospitals and local health departments to provide current information on the outbreaks of respiratory disease recently recognized in Asia:

- **New York State has identified six residents (New York City – 4, Jefferson County – 2) who meet the Centers for Disease Control and Prevention (CDC) case definition for SARS. All six cases are associated with travel to affected regions and not the result of transmission from healthcare workers or family contacts in New York State.**
- **Updated CDC SARS Interim Case Definition**
- **Clinical description of reported cases**
- **Updated specimen collection guidelines for potential cases of SARS**
- **Infection control precautions for aerosol-generating procedures on SARS patients**
- **Patients presenting with fever and respiratory syndromes should immediately be asked about travel to affected areas in the 10 days* prior to illness. (****The incubation period for SARS is typically 2-7 days; however, isolated reports have suggested an incubation as long as 10 days)***
- **Patients with recent travel to Asia or close contact with a SARS case who develop fever and acute respiratory disease syndrome should be rapidly isolated in an airborne infection isolation room with airborne and contact precautions.**
- **All patients who meet the suspect SARS case definition (see below) should be immediately reported to the local health department.**

I. Current Situation

Since mid-February, the World Health Organization (WHO) has received 1408 reports of patients with Severe Acute Respiratory Syndrome (SARS), including *53* deaths, from China, Guandong Province, China, Hong Kong Special Administrative Region of China, Singapore, Viet Nam, Canada, Taiwan, Germany, Thailand, United Kingdom, Italy, Switzerland, France, Republic of Ireland, and the United States. The CDC is reporting 51 suspected cases under investigation in the United States. Canada has received reports of 28 individuals who have become ill with severe acute respiratory syndrome in Ontario and British Columbia, including 3 deaths. The vast majority of SARS cases are concentrated in Guangdong Province, China, Hong Kong Special Administrative Region of China, China and Hanoi, Viet Nam. Reported cases from other areas have been linked to travel within the past 10 days to Hong Kong, China and Hanoi. Isolated cases continue to be reported. The overwhelming majority of SARS cases are occurring in health care workers and their families who have had direct contact with SARS patients.

No link so far has been established between the outbreaks of acute respiratory illness in Hanoi and Hong Kong and the outbreaks of 'bird flu' A (H5N1) reported previously from Hong Kong. It has been reported that the leading hypothesis for the cause of severe acute respiratory syndrome (SARS) is a previously unrecognized virus from the coronavirus family. However, further culturing of the virus, sequencing of the viral genome and examining specimens from patients at different stages of their illness still needs to be done before this hypothesis can be confirmed.

II. Clinical Description

As of March 21, 2003, the majority of patients identified as having SARS have been adults aged 25-70 years who were previously healthy. Few cases of SARS have been reported among children aged ≤15years. The typical incubation period for SARS is 2-7 days with isolated reports suggesting an incubation period as long as 10 days. The illness begins generally with a prodrome of fever >100.4°F (>38.0°C). Fever is often high, and may be accompanied by chills, rigors and other symptoms, including headache, malaise, and myalgia. At the onset of illness, some persons have mild respiratory symptoms. Typically, rash and neurologic or gastrointestinal findings are absent; however, some patients have reported diarrhea during the febrile prodrome.

After 3-7 days, a lower respiratory phase begins with the onset of a dry, nonproductive cough or dyspnea, which may be accompanied by or progress to hypoxemia. Ten to twenty percent of cases have required intubation and mechanical ventilation. The case-fatality rate among persons meeting the current WHO case definition is approximately 3%.

Chest radiograph may be normal throughout the febrile prodrome and course of illness. However, in a substantial proportion of patients, the respiratory phase is characterized by early focal infiltrates progressing to more generalized, patchy, interstitial infiltrates. Some chest radiographs of patients in the late stages of SARS also have shown area of consolidation.

Early in the course of disease, the absolute lymphocyte count is often decreased with overall white blood cell counts normal or decreased. At the peak of the respiratory illness, approximately 50% of patients have leucopenia and thrombocytopenia or low-normal platelet counts (50,000—150,000/µl). Early in the respiratory phase, elevated creatine phosphokinase levels (as high as 3,000 IU/L) and hepatic transaminases (two to six times the upper limits of normal) have been noted. In the majority of patients, renal function has remained normal.

The severity of illness is highly variable, ranging from mild illness to death. Some close contacts of cases have reported a mild, febrile illness without respiratory signs or symptoms, suggesting the illness might not always progress to the respiratory phase. Empiric therapy has included antibiotics for atypical pneumonia and antiviral agents such as oseltamivir or ribavirin sometimes in combination with steroids. At present, the most efficacious treatment regimen, if any, is unknown (See Section VI.Treatment).

III. Case Finding

In order to enhance surveillance for this illness, we are requesting immediate reporting of any suspect or probable cases. The CDC has developed the following case definition for severe acute respiratory syndrome (SARS*)*. Due to the close proximity of Toronto, Canada to the New York State border, the NYSDOH is additionally requesting reports of persons meeting the clinical case definition of SARS with travel to Toronto, Canada.

A person with onset of illness after February 1, 2003 with:

(a) measured high fever (> 38 ^{o}C or 100.4 ^{o}F) AND
(b) one or more clinical findings of respiratory illness *(e.g.* cough, shortness of breath, difficulty breathing, hypoxia, or radiographic findings of either pneumonia or acute respiratory distress syndrome) AND
(c) either
    - recent travel to areas with suspected or documented community transmission of SARS (including Hong Kong, Guangdong Province in the People's Republic of China, Singapore, Hanoi, Viet Nam, and Toronto, Canada) within 10 days of symptom onset. OR
    - Close contact within 10 days of onset of symptoms with either a person with a respiratory illness and travel to a SARS area or a person who is under investigation or suspected of having SARS.
      Close contact includes having cared for, having lived with, or having had direct contact with respiratory secretions and/or body fluids of a person with suspected SARS.

Providers seeing patients in emergency rooms and outpatient facilities should ask patients presenting with fever and respiratory symptoms about recent travel to Asia or Toronto, Canada, *or* close contact with a person with suspected SARS.

Any suspected or probable cases should be reported immediately to the local health department. If there are difficulties reaching your local health department, please contact the NYSDOH. During business hours, call 518-473-4436; after hours, call the duty officer at 1-866-881-2809.

IV. Diagnostic Evaluation/Specimen Collection

Clinicians should evaluate any patient suspected of meeting the above CDC case definition for SARS. Initial diagnostic testing should include chest radiograph, pulse oximetry, complete blood counts, blood cultures, sputum Gram stain and bacterial culture, and testing for viral respiratory pathogens (including influenza A and B and respiratory syncytial virus).

In addition, the following clinical specimens should be collected in consultation with public health officials:
- Acute and convalescent serum samples, either at room temperature, iced, or frozen
- Peripheral blood smear, dried, at room temperature

- Nasopharyngeal wash or throat swab in viral transport medium, frozen
- Urine collected during the acute phase of illness. An optimal acute specimen is cell pellet from approximately 50 cc of first void morning urine specimen, re-suspended in 2-3 cc. viral transport medium, tissue culture medium or phosphate buffered saline.
- Frozen and formalin fixed tissues from an autopsy
- Transbronchial or pleural biopsy specimens fixed in formalin
- Bronchoalveolar lavage (BAL) specimens, spun with supernatant frozen and cell pellet fixed in formalin

Clinicians should save any available clinical specimens (respiratory, blood and serum) for additional testing until a specific diagnosis is made. The local health department and NYSDOH will provide additional information on appropriate specimen collection at the time of consultation. We will also arrange for testing of these specimens at the NYSDOH Wadsworth Center, the CDC and other reference laboratories, as needed.

V. Infection Control Guidance

For the ambulatory care setting:

To facilitate identification of patients who may have SARS in ambulatory care settings, targeted screening questions concerning fever, respiratory symptoms, and recent travel should be included at triage or as soon as possible after patient arrival; the most recent case definition for SARS should be used as a basis for such screening questions. Healthcare personnel who are the first points of contact should be trained for SARS screening; in the absence of systematic triage, providers caring for patients in ambulatory care settings should perform such screening before close contact.

A surgical mask should be placed on patients in whom SARS is suspected, and contact (e.g., gloves, gown, and eye protection) and airborne precautions (e.g., an isolation room with negative pressure relative to the surrounding area and use of an N-95 filtering disposable respirator, or respirators of equivalent filtering efficiency, for persons entering the room) should be applied where feasible. Where respirators are not available, healthcare personnel evaluating and caring for suspect SARS patients should wear a surgical mask. Additional guidance regarding SARS infection control in the ambulatory care setting is available at http://www.cdc.gov/ncidod/sars/infectioncontrol.htm.

For the inpatient care setting:

If a suspect SARS patient is admitted to the hospital, infection control personnel should be notified immediately. Infection control measures for inpatients (http://www.cdc.gov/ncidod/hip/ISOLAT/Isolat.htm) should include:

- Standard precautions (e.g., hand hygiene); in addition to routine standard precautions, health care personnel should wear eye protection for all patient contact.
- Contact precautions (e.g., use of gown, gloves and eye protection for contact with the patient or their environment).
- Airborne precautions (e.g., an isolation room with negative pressure relative to the surrounding area and use of an N-95 filtering disposable respirator for persons entering the room)

If airborne isolation precautions, including negative pressure isolation rooms, should be used wherever possible. If this is not possible patients should be placed in a private room with a closed door, and all persons entering the room should wear N-95 respirators. Where possible, a qualitative fit test should be conducted for N-95 respirators; detailed information on fit testing can be accessed at

http://www.osha.gov/SLTC/etools/respiratory/oshafiles/fittesting1.html. Regardless of the availability of facilities for airborne precautions, standard and contact precautions should be implemented for all suspected SARS patients.

For aerosol-generating procedures:

Multiple cases of suspected Severe Acute Respiratory Syndrome (SARS) have occurred in healthcare personnel who had cared for other patients with SARS. During the course of the investigation, CDC has received anecdotal reports that aerosol-generating procedures may have facilitated transmission of the etiologic agent of SARS in some cases. Procedures that induce coughing can increase the likelihood of droplet nuclei being expelled into the air. These potentially aerosol-generating procedures include aerosolized medication treatments (e.g., albuterol), diagnostic sputum induction, bronchoscopy, airway suctioning, and endotracheal intubation. For this reason, healthcare personnel should ensure that patients have been evaluated for SARS before initiation of aerosol-generating procedures. Evaluation for SARS should be based on the most recent case definition for SARS. Aerosol-inducing procedures should be performed on patients who may have SARS only when such procedures are deemed medically necessary. These procedures should be performed using airborne precautions as previously described for other infectious agents, such as Mycobacterium tuberculosis; Guidelines for Preventing the Transmission of *Mycobacterium tuberculosis* in Health-Care Facilities. In summary, healthcare personnel should apply standard, (e.g., hand hygiene), airborne (e.g., respiratory protective devices with a filter efficiency of greater than or equal to 95%), and contact (e.g., gloves, gown, and eyewear) precautions when aerosol-generating procedures are being performed on patients who may have SARS.

For home or residential care setting:

Placing a surgical mask on suspect SARS patients during contact with others at home is recommended. If the patient is unable to wear a surgical mask, it may be prudent for household members to wear surgical masks when in close contact with the patient.

VI. Treatment

Because the etiology of these illnesses has not yet been determined, no specific treatment recommendations can be made at this time. Empiric therapy should include coverage for organisms associated with any community-acquired pneumonia of unclear etiology, including agents with activity against both typical and atypical respiratory pathogens (See Bartlett, *et. al.* reference below). Treatment choices may be influenced by severity of the illness and an infectious disease consultation is recommended.

VII. Additional Information

For additional information on this evolving outbreak, please check the following sites:

Centers for Disease Control and Prevention: http://www.cdc.gov

World Health Organization http://www.who.int/en/

Updates on this outbreak, as well as the CDC and WHO alerts, will be posted on the NYSDOH's Health Alert Network (HAN): https://commerce.health.state.ny.us/hpn

References on infection control precautions and the treatment of community-acquired pneumonia include:

1. Garner JS, Hospital Infection Control Practices Advisory Committee. Guideline for isolation precautions in hospitals. Infect Control Hosp Epidemiol 1996;17:53-80, and Am J Infect Control 1996;24:24-52. http://www.cdc.gov/ncidod/hip/ISOLAT/Isolat.htm

2. Bartlett JG, Dowell SF, Mandell LA, File Jr, TM, Musher DM, and Fine MJ. Practice Guidelines for the Management of Community-Acquired Pneumonia in Adults. Clin Infect Dis 2000;31:347-82. http://www.journals.uchicago.edu/CID/journal/issues/v31n2/000441/000441.web.pdf

Information in this alert was adapted from the CDC's Health Alerts (CDCHAN-000118; CDCHAN-00019),CDC's Updated Interim Domestic Infection Control Guidance in the Health Care and Community Setting for Patients with Suspected SARS and the World Health Organization Severe Acute Respiratory Syndrome (SARS) multi-country outbreak – Update12, MMWR vol. 52(12);255-256.