

# Health Alert

July 28, 2003

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## **Health Alert #43 – Update 7/28/03 Severe Acute Respiratory Syndrome (SARS)**

New/updated information is indicated by **NEW** or **Updated**.  
[Dates noted in this document are date of release by CDC].  
This health alert updates information in Health Alert #43  
(previously updated 7/8/03) and replaces HA#42.

**FROM: RICHARD C. DUNN  
DIRECTOR**

**SUBJECT: Severe Acute Respiratory Syndrome (SARS)**

Severe Acute Respiratory Syndrome (SARS) is a communicable respiratory illness, apparently caused by a newly discovered coronavirus, and primarily spread by close person-to-person contact. SARS has been reported in a number of countries, particularly in areas of Asia and in Toronto, Canada. In some affected persons, the illness can be very severe, and can result in death. No specific treatment for the condition is currently available, and it is essential that all reasonable steps be taken to identify persons who have SARS and prevent transmission of the infectious agent from these persons to their close contacts. This Health Alert contains information and recommendations from the Centers for Disease Control and Prevention (CDC). **Since the last update (on 7/8/03), the SARS case definition has undergone changes, and new information on diagnostic testing and test interpretation has been added.**

**It is important to emphasize that transmission of SARS in health care facilities has occurred after close contact with symptomatic individuals before recommended appropriate infection control precautions were implemented. To facilitate identification of patients who may have SARS in emergency rooms, physician's offices, and other ambulatory care settings, targeted screening questions concerning fever, respiratory symptoms, close contact with a SARS suspect case patient, and recent travel should be included when patients call for appointments and at triage or as soon as possible after patient arrival. The most recent case definition for SARS, which is provided in the first section of this Health Alert, should be used as the basis for questions regarding travel history.**

**It is very important that health-care personnel who are the first points of contact with patients be trained to perform SARS screening. In the absence of a systematic screening or triage system, providers taking care of patients in ambulatory care settings should perform such screening before performing other history-taking or examinations. Because patients with developing SARS may present with either only fever or only respiratory symptoms, infection control precautions should be instituted immediately for patients who have either fever or respiratory symptoms and have had close contact with SARS or who have a history of international travel to an area identified by the case definition. A surgical mask should be placed on such patients early during the triage process until other recommended infection control precautions, which are described below, can be instituted.**

**Suspected SARS cases should be immediately reported to the local public health agency, or to the Missouri Department of Health and Senior Services (DHSS) at 1-800-392-0272 (24 hours a day/7 days a week).**

This Health Alert will be updated as new information and recommendations become available. The most recent update can always be accessed by going to the DHSS web site (<http://www.dhss.state.mo.us/>) and clicking on "SARS Update."

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**Description and Case Definition** [July 18, 2003] Updated

Severe Acute Respiratory Syndrome (SARS) is a communicable respiratory illness, believed to be caused by a newly discovered coronavirus (SARS-associated coronavirus, or SARS-CoV) that has recently been reported in a number of countries, particularly in areas of Asia and in Toronto, Canada. The main signs/symptoms of SARS include fever >38° C (100.4° F) and cough, shortness of breath, or difficulty breathing. In some affected persons, the illness can be very severe, and can result in death.

Updated reports on numbers of SARS cases, and countries from which they have been reported, are available on the World Health Organization's (WHO's) SARS web site at <http://www.who.int/csr/sars/country/en/>. Updated reports on U.S. cases are available from the Centers for Disease Control and Prevention (CDC) at <http://www.cdc.gov/ncidod/sars/casecount.htm>.

The case definition is subject to change; the current (July 18, 2003) **CDC interim U.S. case definition** is the following:

The previous CDC SARS case definition (published July 16, 2003) has been updated as follows:

- The Exclusion Criteria have been revised to allow exclusion of cases with a convalescent-phase serum sample (i.e., collected >28 days after symptom onset) that is negative for antibody to SARS-associated coronavirus (SARS-CoV). Testing results from serum previously collected between 22 and 28 days after symptom onset are acceptable and will not require collection of an additional sample >28 days after symptom onset.
- The Case Classification has been revised to exclude probable and suspect SARS cases with convalescent-phase serum samples that are negative for antibody to SARS-CoV.

**Clinical Criteria**

- Asymptomatic or mild respiratory illness
- Moderate respiratory illness
  - Temperature of >100.4°F (>38°C)\*, and
  - One or more clinical findings of respiratory illness (e.g., cough, shortness of breath, difficulty breathing, or hypoxia).
- Severe respiratory illness
  - Temperature of >100.4°F (>38°C)\*, and
  - One or more clinical findings of respiratory illness (e.g., cough, shortness of breath, difficulty breathing, or hypoxia), and
    - radiographic evidence of pneumonia, or
    - respiratory distress syndrome, or
    - autopsy findings consistent with pneumonia or respiratory distress syndrome without an identifiable cause

**Epidemiologic Criteria**

- Travel (including transit in an airport) within 10 days of onset of symptoms to an area with current or previously documented or suspected community transmission of SARS (see Table below),  
or
- Close contact<sup>§</sup> within 10 days of onset of symptoms with a person known or suspected to have SARS.

<b>Table. Travel criteria for suspect or probable U.S. cases of SARS</b>		
<b>Area</b>	<b>First date of illness onset for inclusion as reported case<sup>‡</sup></b>	<b>Last date of illness onset for inclusion as reported case<sup>†</sup></b>
China (Mainland)	November 1, 2002	July 13, 2003
Hong Kong	February 1, 2003	July 11, 2003
Hanoi, Vietnam	February 1, 2003	May 25, 2003
Singapore	February 1, 2003	June 14, 2003
Toronto, Canada	April 1, 2003	July 18, 2003
Taiwan	May 1, 2003	July 25, 2003
Beijing, China	November 1, 2002	July 21, 2003

The last date for illness onset is 10 days (i.e., one incubation period) after removal of a CDC travel alert. The case patient's travel should have occurred on or before the last date the travel alert was in place.

#### Laboratory Criteria

- Confirmed
  - Detection of antibody to SARS-associated coronavirus (SARS-CoV) in a serum sample, or
  - Detection of SARS-CoV RNA by RT-PCR confirmed by a second PCR assay, by using a second aliquot of the specimen and a different set of PCR primers, or
  - Isolation of SARS-CoV.
- Negative
  - Absence of antibody to SARS-CoV in a convalescent-phase serum sample obtained >28 days after symptom onset. \*\*
- Undetermined
  - Laboratory testing either not performed or incomplete.

#### Case Classification\*\*\*

- Probable case: meets the clinical criteria for severe respiratory illness of unknown etiology and epidemiologic criteria for exposure; laboratory criteria confirmed or undetermined.
- Suspect case: meets the clinical criteria for moderate respiratory illness of unknown etiology, and epidemiologic criteria for exposure; laboratory criteria confirmed or undetermined.

#### Exclusion Criteria

A case may be excluded as a suspect or probable SARS case if:

- An alternative diagnosis can fully explain the illness.\*\*\*\*
- The case has a convalescent-phase serum sample (i.e., obtained >28 days after symptom onset) which is negative for antibody to SARS-CoV.\*\*
- The case was reported on the basis of contact with an index case that was subsequently excluded as a case of SARS, provided other possible epidemiologic exposure criteria are not present.

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\* A measured documented temperature of >100.4°F (>38°C) is preferred. However, clinical judgment should be used when evaluating patients for whom a measured temperature of >100.4°F (>38°C) has not been documented. Factors that might be considered include patient self-report of fever, use of antipyretics, presence of immunocompromising conditions or therapies, lack of access to health care, or inability to obtain a measured temperature. Reporting authorities should consider these factors when classifying patients who do not strictly meet the clinical criteria for this case definition.

§ Close contact is defined as having cared for or lived with a person known to have SARS or having a high likelihood of direct contact with respiratory secretions and/or body fluids of a patient known to have SARS. Examples of close contact include kissing or embracing, sharing eating or drinking utensils, close conversation (<3 feet), physical examination, and any other direct physical contact between persons. Close contact does not include activities such as walking by a person or sitting across a waiting room or office for a brief period of time.

‡ The WHO has specified that the surveillance period for China should begin on November 1; the first recognized cases in Hong Kong, Singapore and Hanoi (Vietnam) had onset in February 2003. The date for Toronto is linked to the occurrence of a laboratory confirmed case of SARS in a U.S. resident who had traveled to Toronto; the date for Taiwan is linked to CDC's issuance of travel recommendations.

† The last date for illness onset is 10 days (i.e., one incubation period) after removal of a CDC travel alert. The case patient's travel should have occurred on or before the last date the travel alert was in place. Assays for the laboratory diagnosis of SARS-CoV infection include enzyme-linked immunosorbent assay, indirect fluorescent-antibody assay, and reverse transcription polymerase chain reaction (RT-PCR) assays of appropriately collected clinical specimens (Source: CDC. Guidelines for collection of specimens from potential cases of SARS. Available at [www.cdc.gov/ncidod/sars/specimen\\_collection\\_sars2.htm](http://www.cdc.gov/ncidod/sars/specimen_collection_sars2.htm)). Absence of SARS-CoV antibody from serum obtained <28 days after illness onset,\*\* a negative PCR test, or a negative viral culture does not exclude SARS-CoV infection and is not considered a definitive laboratory result. In these instances, a convalescent serum sample obtained >28 days after illness is needed to determine infection with SARS-CoV.\*\* All SARS diagnostic assays are under evaluation.

\*\*Does not apply to serum samples collected before July 11, 2003. Testing results from serum samples collected before July 11, 2003 and between 22 and 28 days after symptom onset are acceptable and will not require collection of an additional sample >28 days after symptom onset.

\*\*\* Asymptomatic SARS-CoV infection or clinical manifestations other than respiratory illness might be identified as more is learned about SARS-CoV infection.

\*\*\*\* Factors that may be considered in assigning alternate diagnoses include the strength of the epidemiologic exposure criteria for SARS, the specificity of the diagnostic test, and the compatibility of the clinical presentation and course of illness for the alternative diagnosis.

## **Etiology**

The cause of SARS has been determined to be infection with a previously unrecognized human coronavirus, called SARS-associated coronavirus (SARS-CoV). Scientists from CDC and other institutions have published reports in peer-reviewed journals describing the isolation and characterization of SARS-CoV and its association with SARS. Although these reports provide strong evidence that this new coronavirus is the etiologic agent of SARS, it is possible that other pathogens might have a role in some cases of SARS.

## **Transmission** [June 3, 2003]

The primary way that SARS appears to spread is by close person-to-person contact. Close contact might occur when people live together in the same household or if someone is providing care to a SARS patient. Examples include kissing or embracing, sharing eating or drinking utensils, close conversation (within 3 feet), physical examination, and any other direct physical contact between people. Close contact does not include activities such as walking by a person or sitting across a waiting room or office for a brief period of time.

Most cases of SARS have involved people who cared for or lived with someone with SARS, or had direct contact with infectious material (for example, respiratory secretions) from a person who has SARS. Respiratory droplet and contact transmission appear to be the predominant modes of transmission. Potential ways in which SARS can be spread include touching the skin of other persons or objects (fomites) that are contaminated with infectious droplets and then touching the eye, nose, or mouth. This can happen when someone who is sick with SARS coughs or sneezes droplets onto themselves, other persons, or nearby surfaces. It is also possible that SARS can be spread more broadly through the air (i.e., airborne transmission) or by other ways that are currently not known. It is not uncommon for respiratory viruses to be found in feces for a period of time. Some laboratories have reported finding the new coronavirus in stool specimens. Research is under way to learn more about the presence and concentration of the virus in different body fluids, including feces. Researchers also are evaluating if the virus can spread to others through different body fluids.

Regarding potential transmission via fomites, contamination of environmental surfaces would be a particular concern in health-care settings and households where patients with SARS would be receiving care. Furniture, clothing, and other items imported from countries where SARS has been found would be expected to pose little, if any, risk of transmission of SARS.

Preliminary studies in some research laboratories suggest that SARS-CoV may survive in the environment for several days. The length of time that the virus survives likely depends on a number of factors. These factors could include the type of material or body fluid containing the virus and various environmental conditions such as temperature or humidity. Additional studies are under way to obtain further understanding of this important issue. (Note that the current data on survival of SARS Co-V outside of the human body emphasize the importance of frequent handwashing with soap and water or use of alcohol-based hand rubs if hands are not visibly dirty.)

Currently, CDC does not have epidemiologic evidence for high risk of transmission of SARS Co-V infection from persons who are without fever or respiratory symptoms. However, according to recent reports health-care workers who developed SARS may have been a source of transmission within health-care facilities during the early phases of illness when symptoms were mild and not recognized as SARS.

Given what is known about the transmission of SARS, infection-control recommendations should include precautions to prevent airborne, droplet, and contact transmission. Hand hygiene is of primary importance for all individuals who have contact with possible SARS patients.

In the U.S., efforts to prevent further transmission of the etiologic agent of SARS have been focused on rapid identification and early isolation of symptomatic persons whose illnesses meet the [case definition](#).

### **Incubation Period**

The incubation period for SARS is typically 2-7 days; however, isolated reports have suggested an incubation period as long as 10 days.

### **Clinical Description of SARS**

This section summarizes the clinical description of patients with SARS based on information collected since mid-February 2003. This information is preliminary and limited by the broad and necessarily nonspecific case definition. (An additional description of the clinical, laboratory, and radiologic features of patients with probable SARS is available in an *Emerging Infectious Diseases* article available at <http://www.cdc.gov/ncidod/EID/vol9no6/03-0264.htm>.)

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 suspected cases of SARS have been reported among children aged  $\leq 15$  years.

(No instances of SARS-CoV infection have been detected in persons who are asymptomatic. However, data are insufficient to exclude the possibility of asymptomatic infection with SARS-CoV and the possibility that such persons can transmit the virus.)

The incubation period for SARS is typically 2-7 days; however, isolated reports have suggested an incubation period as long as 10 days. The illness begins generally with a prodrome of fever ( $>100.4^{\circ}\text{F}$  [ $>38.0^{\circ}\text{C}$ ]). Fever often is high, sometimes is associated with chills and rigors, and might be accompanied by 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. (CDC has noted that the clinical manifestations of SARS might extend beyond respiratory illness.)

After 3-7 days, a lower respiratory phase begins with the onset of a dry, nonproductive cough or dyspnea, which might be accompanied by or progress to hypoxemia. In 10%-20% of cases, the respiratory illness is severe enough to require intubation and mechanical ventilation. The case-fatality rate among persons with illness meeting the current WHO case definition of SARS is approximately 3%.

Chest radiographs might be normal during the febrile prodrome and throughout the course of illness. However, in a substantial proportion of patients, the respiratory phase is characterized by early focal interstitial infiltrates progressing to more generalized, patchy, interstitial infiltrates. Some chest radiographs from patients in the late stages of SARS also have shown areas of consolidation. (Pictures of the chest radiograph and CT features of recent cases of atypical pneumonia are available at [http://www.droid.cuhk.edu.hk/web/atypical\\_pneumonia/atypical\\_pneumonia.htm](http://www.droid.cuhk.edu.hk/web/atypical_pneumonia/atypical_pneumonia.htm).)



Early in the course of disease, the absolute lymphocyte count is often decreased. Overall white blood cell counts have generally been normal or decreased. At the peak of the respiratory illness, approximately 50% of patients have leukopenia and thrombocytopenia or low-normal platelet counts (50,000-150,000/ $\mu$ L). 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 might be highly variable, ranging from mild illness to death. Although a few close contacts of patients with SARS have developed a similar illness, the majority has remained well. Some close contacts have reported a mild, febrile illness without respiratory signs or symptoms, suggesting the illness might not always progress to the respiratory phase.

Treatment regimens have included several antibiotics to presumptively treat known bacterial agents of atypical pneumonia. In several locations, therapy also has included antiviral agents such as oseltamivir or ribavirin. Steroids have also been administered orally or intravenously to patients in combination with ribavirin and other antimicrobials. At present, the most efficacious treatment regimen, if any, is unknown.

[The April 11, 2003, *MMWR* (<http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5214a1.htm>), which includes clinical descriptions of five SARS patients, makes the following additional points regarding treatment: The majority of U.S. residents with SARS have recovered or stabilized clinically without specific antiviral therapy. The efficacy of available antiviral therapies against coronavirus infection is unknown. Ribavirin is a known teratogen, and clinicians who use it should be aware of all potential adverse events, including severe hemolytic anemia. Preliminary results from in vitro testing indicate that ribavirin concentrations that inhibit ribavirin-sensitive viruses do not inhibit replication or cell-to-cell spread of the novel coronavirus, which may be the primary causative agent of SARS. However, further in vitro testing of antiviral drugs on other coronavirus isolates, and more information on the clinical outcomes of patients treated with ribavirin or other antiviral drugs in controlled trials is needed.]

Clinicians should carefully evaluate persons suspected of having SARS and, if indicated, admit them to the hospital. Close contacts and healthcare workers should seek medical care for symptoms of respiratory illness.

Clinical consultation with CDC physicians on the evaluation of patients who are suspected of having SARS is available (see the section entitled "[Clinical Consultation](#)" below).

Clinicians evaluating suspected cases should use standard precautions (e.g., hand hygiene) together with airborne (e.g., N-95 respirator) and contact (e.g., gowns and gloves) precautions (see the section below entitled "[Infection Control Recommendations for Health Care and Community Settings](#)"). Until the mode of transmission has been defined more precisely, eye protection also should be worn for all patient contact. As more clinical and epidemiologic information becomes available, interim recommendations will be updated.

### **[Diagnostic Testing/Specimen Collection for Potential Cases of SARS](#)** [July 18, 2003] **Updated**

**If a patient is suspected to have SARS, immediately notify your local public health agency or the Missouri Department of Health and Senior Services (DHSS) at 1-800-392-0272 (24 hours a day/7 days a week). DHSS's disease investigation unit will work with the local public health agency, the Missouri State Public Health Laboratory (MSPHL), and the physician and/or hospital to determine whether testing is warranted. If testing is required, DHSS and MSPHL will provide consultation**



**on laboratory specimen collection and coordinate the transportation of appropriate specimens to MSPHL.**

Initial diagnostic testing for suspected SARS patients should include chest radiograph, pulse oximetry, blood cultures, sputum Gram's stain and culture, and testing for viral respiratory pathogens, notably influenza A and B and respiratory syncytial virus. A specimen for Legionella and pneumococcal urinary antigen testing should also be considered. Clinicians should save any available clinical specimens (respiratory, blood, and serum) for additional testing until a specific diagnosis is made. **Acute and convalescent (>28 days after onset of symptoms) serum samples should be collected from each patient who meets the SARS case definition.** Paired sera can be forwarded through MSPHL for testing at CDC.

MSPHL is currently offering serology and polymerase chain reaction (PCR) testing for SARS coronavirus (SARS-CoV). **Testing will only be performed on patients that have been approved by DHSS's disease investigation unit.** If specimens are to be sent to MSPHL, the following samples should be collected: (1) serum for ELISA Serology, (2) respiratory specimen for PCR. Specimens that test negative for SARS-CoV by both ELISA and PCR will be tested for influenza and respiratory syncytial virus (RSV) by ELISA, and virus culture will be performed for a viral respiratory panel that includes influenza, parainfluenza, RSV, adenovirus, and enterovirus.

For detailed information on submitting clinical specimens to MSPHL for SARS testing, see [http://www.dhss.state.mo.us/Lab/sars\\_specimens\\_files/SARSINS1.pdf](http://www.dhss.state.mo.us/Lab/sars_specimens_files/SARSINS1.pdf).

A SARS specimen submission form, as well as copies of consent forms for SARS testing, are available at [http://www.dhss.state.mo.us/Lab/sars\\_specimens\\_files/sars.htm](http://www.dhss.state.mo.us/Lab/sars_specimens_files/sars.htm).

Guidelines for collection of specimens from potential SARS cases is available from CDC at [http://www.cdc.gov/ncidod/sars/specimen\\_collection\\_sars2.htm](http://www.cdc.gov/ncidod/sars/specimen_collection_sars2.htm).

Additional information from CDC on specimens for SARS testing is available at <http://www.cdc.gov/ncidod/sars/lab.htm>.

Information for patients regarding SARS testing is available from CDC at <http://www.cdc.gov/ncidod/sars/lab/eia/participant.htm>.

### **Interpreting SARS Test Results** [July 18, 2003] **Updated**

### **Guidelines for Laboratory Diagnosis of SARS-CoV Infection** [July 3, 2003]

CDC has published the following interim guidelines for laboratory diagnosis of SARS-CoV infection:

- Detection of serum antibody to SARS-CoV by a validated test (e.g., enzyme-linked immunosorbent assay [ELISA]), or
- Isolation in cell culture of SARS-CoV from a clinical specimen, and PCR confirmation using a test validated by CDC, or
- Detection of SARS-CoV RNA by a reverse transcription-polymerase chain reaction (RT-PCR) test validated by CDC from

- One specimen tested on two occasions using the original clinical specimen on each occasion, or
- Two clinical specimens from different sources (e.g., nasopharyngeal and stool), or
- Two clinical specimens collected from the same source on 2 different days (e.g., 2 nasopharyngeal aspirates).

**Fact Sheet for Clinicians: Interpreting SARS Test Results** [July 24, 2003] **Updated**

The cause of SARS has been determined to be infection with a previously unrecognized human coronavirus, called SARS-associated coronavirus (SARS-CoV). Scientists from CDC and other institutions have published reports in peer-reviewed journals describing the isolation and characterization of SARS-CoV and its association with SARS. Although these reports provide strong evidence that this new coronavirus is the etiologic agent of SARS, it is possible that other pathogens might have a role in some cases of SARS.

CDC and others have developed new tests for detecting SARS-CoV. Using these tests, CDC has identified evidence of SARS-CoV infection in several U.S. residents. Following are some key issues that clinicians providing care for patients with SARS may find useful when interpreting SARS-CoV testing results. (Note: information about laboratory tests for SARS-CoV and the interpretation of results from these tests may change.)

What tests for SARS CoV are being done and which results are being reported?

At this time, tests for SARS-CoV are still being refined, and the sensitivity and specificity are uncertain and still being evaluated. It also is not known which tests perform best at which time points after onset of a patient's illness. Several types of newly developed tests are being used to test for SARS-CoV:

1. Serum antibody tests, including both enzyme immunoassay (EIA) and indirect fluorescent-antibody (IFA) formats, have been developed. State public health laboratories are using the EIA. At this time, CDC is interpreting positive test results to indicate previous infection with SARS-CoV. However, some people do not test positive until more than 28 days after onset of illness. Therefore, a negative test result can be considered a true negative only if the specimen was collected more than 28 days after the patient's onset of illness. For patients with a negative antibody test result whose specimens were obtained 28 or fewer days after illness onset, an additional antibody test should be done on a specimen drawn more than 28 days after onset to determine if they are negative or positive for SARS-CoV. The recommended timing of the second sample may be adjusted as more information becomes available.
2. Reverse transcription-polymerase chain reaction (RT-PCR) testing is also available. This test can detect SARS-CoV RNA in clinical specimens, including serum, stool, and nasal secretions.
3. Viral isolation for SARS-CoV also has been done. In these studies, clinical specimens from SARS patients are co-cultured with well-characterized cell lines, and then laboratorians look for evidence of SARS-CoV replication in these cultured cells.

The number of tests that can be done is limited by the amount and type of specimens and the test type. If there is sufficient specimen, both antibody testing and the RT-PCR are done. Viral isolation is the most difficult and time-consuming test and cannot be done on all patients.

What does it mean if a patient with SARS has a positive test result for SARS-CoV?

A positive test result suggests that the patient with SARS has or recently had an infection with SARS-CoV. However, it is possible that a positive test result could be incorrect (“false-positive”). As the tests are improved, CDC may re-test specimens from SARS patients with positive results, and results from these improved tests might be negative.

What does it mean if a patient with SARS has a negative test result for SARS-CoV?

Some patients with clinical and epidemiologic criteria that meet the case definition (see the above section entitled “[Description and Case Definition](#)”) for SARS may have negative test results for SARS-CoV. There are several possibilities to explain negative test results for SARS-CoV:

1. The patient did not have an infection with SARS-CoV. The patient may have a SARS-like illness caused by other viruses or infectious agents. It can sometimes be difficult to find out which infectious agent is causing a person to be ill with fever, respiratory symptoms, and pneumonia. For example, only about half of all diagnosed cases of pneumonia have a specific etiologic agent detected.
2. The test results may be incorrect (“false-negative”). As the tests are improved, CDC may re-test specimens from SARS patients with negative test results. Results from more-sensitive, improved tests might be positive.
3. The samples were not obtained at a time point in the course of SARS-CoV infection when test results are positive. The RT-PCR result will be positive only if there is viral RNA in the specimen. This may be for a fairly brief period, depending on which specimen (e.g., serum, stool, nasal secretions) was tested. The antibody tests may not become positive until more than 28 days after illness onset and possibly longer.

What does it mean if the test results are positive for human metapneumovirus?

CDC has tested some specimens from SARS patients for a variety of viruses, including human metapneumovirus. Human metapneumovirus is a recently recognized virus that belongs to the paramyxovirus family of viruses, which cause a broad range of respiratory and childhood illnesses, including mumps, measles, and croup. Human metapneumovirus is genetically related to respiratory syncytial virus, a common cause of lower respiratory tract infection in children. Several laboratories have reported positive test results for human metapneumovirus in some patients with SARS. There is not enough information to determine what role, if any, human metapneumovirus might have in some cases of SARS.

Should a patient with SARS who has negative SARS-CoV test results continue with the isolation precautions recommended by CDC and other public health authorities?

As noted above, the interpretation of negative SARS-CoV test results can vary depending on which test was performed and when the testing was done. CDC advises that isolation precautions for SARS patients should be continued even if laboratory test results for SARS-CoV are negative. This recommendation is subject to change. Evaluating physicians may wish to consult their local public health authorities for advice on interpretation of SARS-CoV test results. Physicians can also check the CDC SARS web site (at <http://www.cdc.gov/ncidod/sars/>) for the most recent information on the interpretation of SARS-CoV laboratory results.

All SARS patients should limit interactions outside the home and should not go to work, school, out-of-home childcare, or other public areas until 10 days after resolution of fever and respiratory symptoms.

During this time, the infection control precautions for SARS patients should be followed (see the section below entitled "[Households or residential settings](#)").

Has the new information about SARS-CoV changed the recommendations for medical treatment for patients with SARS?

The discovery that SARS-CoV is the cause of SARS has not changed treatment recommendations (see the next section entitled "Treatment", and CDC's SARS web site (<http://www.cdc.gov/ncidod/sars/>), for treatment information). The new coronavirus is being tested against various antiviral drugs to see if an effective treatment can be found.

Should a person who traveled to an area where there is community transmission (see the [case definition](#)) of SARS or who had contact with a SARS patient be tested even if not ill?

People who have potentially been exposed to SARS patients should not be tested unless CDC or their state health department specifically asks them to be part of one of the ongoing SARS investigations. We do not yet know how to interpret the results of testing of persons who are not ill.

What other investigations related to SARS are planned?

The state health department or CDC may contact some SARS patients regardless of whether the SARS-CoV test result was positive or negative. These patients might be asked to participate in investigations that are trying to find out more about the new coronavirus and SARS and how they are related to each other. If a patient agrees to take part in those investigations, his or her permission would be requested to collect more specimens for testing. Participation is voluntary.

## **Treatment**

CDC has stated that, because the etiology of SARS 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.\* Treatment choices may be influenced by the severity of the illness. Infectious disease consultation is recommended. Clinical consultation with CDC physicians on treatment of suspected/confirmed cases is also available and is strongly encouraged (see the next section entitled "[Clinical Consultation](#)").

As stated above, treatment regimens that have been utilized to date have included several antibiotics to presumptively treat known bacterial agents of atypical pneumonia. In several locations, therapy also has included antiviral agents such as oseltamivir or ribavirin. Steroids have also been administered orally or intravenously to patients in combination with ribavirin and other antimicrobials. CDC emphasizes that, at present, the most efficacious treatment regimen, if any, is unknown.

\*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>

## **Clinical Consultation**

Clinical consultation on suspected/confirmed SARS cases is available from CDC's SARS Clinical Management Team at **770-488-7100**.

## **Infection Control Recommendations for Health Care and Community Settings**

CDC has issued revised interim guidance concerning SARS infection control precautions in the health-care and community setting. Health-care personnel should apply these precautions for any contact with patients with suspected SARS. Note that the [case definition](#) for suspected SARS is subject to change, particularly concerning travel history as transmission is reported in particular geographic areas.

**For all contact with suspect SARS patients, careful hand hygiene is urged, including hand washing with soap and water; if hands are not visibly soiled, alcohol-based handrubs may be used as an alternative to hand washing. See [www.cdc.gov/handhygiene](http://www.cdc.gov/handhygiene) for more information on hand hygiene.**

See also the CDC web site entitled "Respiratory Protection" at <http://www.cdc.gov/ncidod/sars/res-protection.htm>, and the NIOSH web site entitled "Understanding Respiratory Protection Against SARS" at <http://www.cdc.gov/niosh/npptl/respirators/respsars.html>.

### **Inpatient settings:** [May 1, 2003]

If a suspect SARS patient is admitted to the hospital, infection control personnel should be notified immediately. Infection control measures for inpatients ([www.cdc.gov/ncidod/hip/isolat/isolat.htm](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 and gloves 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 precautions cannot be fully implemented, patients should be placed in a private room, 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/oshfiles/fittesting1.html>. If N-95 respirators are not available for health-care personnel, then surgical masks should be worn. Regardless of the availability of facilities for airborne precautions, standard and contact precautions should be implemented for all suspected SARS patients.

### **Outpatient settings:** [May 1, 2003]

Persons seeking medical care for an acute respiratory infection should be asked about possible exposure to someone with SARS or recent travel to an area with SARS. If SARS is suspected, provide and place a surgical mask over the patient's nose and mouth. If masking the patient is not feasible, the patient should be asked to cover his/her mouth with a disposable tissue when coughing, talking or sneezing. Separate the patient from others in the reception area as soon as possible, preferably in a private room with negative pressure relative to the surrounding area.

All health-care personnel should wear N-95 respirators while taking care of patients with suspected SARS. In addition, health care personnel should follow standard precautions (e.g., hand hygiene), contact precautions (e.g., use of gown and gloves for contact with the patient or their environment) and wear eye protection for all patient contact.

For more information, see the next section entitled “Triage and disposition.”

### **Triage and disposition** [April 25, 2003]

To facilitate identification of patients who may have SARS in ambulatory care settings, targeted screening questions concerning fever, respiratory symptoms, close contact with a SARS suspect case patient, and recent travel should be included when patients call for appointments and at triage or as soon as possible after patient arrival. The most recent case definition for SARS should be used as the basis for questions regarding travel history (see the above section entitled “[Description and Case Definition](#)”).

- Health-care personnel who are the first points of contact should be trained to perform SARS screening. In the absence of a systematic screening or triage system, providers taking care of patients in ambulatory care settings should perform such screening before performing other history taking or examinations.
- Because patients with developing SARS may present with either only fever or only respiratory symptoms, infection control precautions should be instituted immediately for patients who have either fever or respiratory symptoms and have had close contact with SARS or who have a history of international travel to an area identified by the [case definition](#). A surgical mask should be placed on such patients early during the triage process until other recommended infection control precautions can be instituted including:
  - 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 and gloves 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). Where respirators are not available, healthcare personnel evaluating and caring for suspect SARS patients should wear a surgical mask.

Decisions concerning inpatient hospital admission or discharge of a patient with suspected or developing SARS should generally be based on the patient's health-care needs (e.g., diagnostic, therapeutic, or supportive regimens that necessitate hospitalization).

- Patients should not be hospitalized solely for the purpose of infection control unless they cannot be discharged directly to their home (e.g. travelers, homeless persons) or if infection precautions recommended for the home or residential setting (see the section below entitled “[Households or residential settings](#)”) are not feasible in their home environment (e.g. crowded dormitory setting, prisons, jails, detention centers, homeless shelters, or other multi-person single room dwellings).
- Under such circumstances patients should be hospitalized using recommended infection control precautions. Patients may then be discharged as soon as arrangements can be made for discharge directly to a home or residential setting where appropriate infection control precautions can be implemented and maintained.



- Alternatively, the patient could be discharged to a designated residential facility for isolation of convalescing cases where recommended infection control measures can be followed (see the section below entitled "[Households or residential settings](#)").
- During transport between health-care facility and home or residential setting, patients should wear a surgical mask and limit interactions with others (e.g., avoid public transportation). For emergency medical ground transport of SARS patients, see the section below entitled "[Pre-hospital emergency medical care and transport of SARS patients](#)".

### **Cleaning and Disinfection of the SARS Patient Environment** [April 28, 2003]

Cleaning and disinfection of environmental surfaces are important components of routine infection control in healthcare facilities. Although environmental surfaces (e.g., floors, table tops) are generally not involved in transmission of microorganisms, some surfaces, especially those that are touched frequently (e.g., bed rails, door knobs, lavatory surfaces) may serve as important reservoirs of microbial contamination. When these surfaces are touched, the microbial agents can be transferred to nose, mouth, eyes, or other environmental surfaces. The performance of hand hygiene ([www.cdc.gov/handhygiene](http://www.cdc.gov/handhygiene)) and adhering to a regular schedule of cleaning and disinfection will help reduce the microbial burden in the patient's environment. This may be an important adjunct measure for controlling the spread of SARS in healthcare settings. Personnel who are assigned this responsibility should be trained and supervised in cleaning and disinfection methods. In areas with a high volume of SARS patients, consideration may be given to designating specific personnel for this task.

The approach to environmental cleaning and disinfection for SARS will follow the same principles used for controlling the spread of other infections in healthcare settings.

#### **Personal Protective Equipment**

Personnel involved in cleaning and disinfection activities should wear appropriate personal protective equipment. Wear full protective attire as required for contact and airborne precautions (disposable gown, utility gloves, and N95 respirator) plus eye protection (goggles or face shield) (see the section below entitled "[Use of respirators to prevent transmission of SARS](#)") as long as the patient is in the room. Once the patient has been transferred or discharged, wear gown and gloves for post-discharge cleaning.

Postpone initiation of cleaning to allow time for the ventilation system to remove any residual airborne viral particles. In most general patient care areas in U.S. healthcare facilities, the heating, ventilation and air-conditioning (HVAC) systems are generally engineered to provide approximately 6 air changes per hour (ACH). (See table of time required for particulate removal relative to ACH in a room in "Guidelines for Preventing the Transmission of *Mycobacterium tuberculosis* in Health-Care Facilities, 1994" at <http://www.cdc.gov/mmwr/preview/mmwrhtml/00035909.htm>.)

#### **Type of Cleaning and Disinfectant Agents**

Any EPA-registered\* hospital detergent-disinfectant currently used by healthcare facilities for environmental sanitation may be used. Manufacturer's recommendations for use-dilution (i.e., concentration), contact time and care in handling should be followed.

#### **Cleaning methods**

In-patient rooms housing SARS patients should be cleaned and disinfected daily and at the time of patient transfer or discharge.

- Daily cleaning and disinfection should include horizontal surfaces (e.g., over-bed table, night stand) surfaces that are frequently touched by patients and healthcare personnel (e.g., bed rails,



phone) and lavatory facilities. To facilitate daily cleaning, the area around the patient should be kept free of unnecessary equipment and supplies.

- Terminal cleaning and disinfection following transfer or discharge should include the type of surfaces described above plus obviously soiled vertical surfaces, frequently touched surfaces (e.g., light cords and switches, door knobs), and durable patient equipment (e.g., bed, night stand, over-bed table, wheelchair, commode). Curtain dividers also should be changed and laundered as appropriate for the curtain fabric. There is no need to routinely clean and disinfect walls, window drapes, and other vertical surfaces unless visibly soiled; disinfectant fogging for purposes of air disinfection is not recommended.
- Patient care equipment such as mechanical ventilators, pulse oximeters, blood pressure cuff, should be cleaned and disinfected in accordance with current CDC recommendations, manufacturer's instructions and facility procedures for critical, semi-critical and non-critical surfaces. See [www.cdc.gov/ncidod/hip/isolat/isolat.htm](http://www.cdc.gov/ncidod/hip/isolat/isolat.htm) and [www.cdc.gov/ncidod/hip/sterile/sterile.htm](http://www.cdc.gov/ncidod/hip/sterile/sterile.htm).

Cubicles or rooms in outpatient areas where patients with suspected SARS are evaluated should be cleaned and disinfected before another patient is seen or cared for in that environment. Areas that should be specifically targeted for cleaning include the examination table and horizontal surfaces that may have been touched by the patient or healthcare provider.

Solutions used for cleaning and disinfection should be discarded after use. Thoroughly rinse and clean housekeeping equipment after use in a SARS room or area and allow the equipment to dry. Launder reusable mop heads and cleaning cloths according to current practice.

\* There are no disinfectant products currently registered by the U.S. Environmental Protection Agency (EPA) specifically for the inactivation of the newly identified viruses associated with SARS. However, related viruses with physical and biochemical properties similar to the possible SARS agents are known to be readily inactivated by EPA-registered chemical germicides that provide low- or intermediate-level disinfection during general use.

### **Management of exposures to SARS for healthcare settings** [June 24, 2003]

Worldwide, several health-care workers have been reported to develop SARS after caring for patients with SARS. Transmission to health-care workers appears to have occurred after close contact with symptomatic individuals (e.g., persons with fever or respiratory symptoms) before recommended infection control precautions for SARS were implemented (i.e., unprotected exposures). Personal protective equipment appropriate for standard, contact, and airborne precautions (e.g., hand hygiene, gown, gloves, and N95 respirator) in addition to eye protection, have been recommended for health-care workers to prevent transmission of SARS in health-care settings (see <http://www.cdc.gov/ncidod/sars/ic.htm>). More general information on infection control in health-care workers is available at <http://www.cdc.gov/ncidod/hip/GUIDE/infectcont98.htm>.

Given the currently available information on the epidemiology of SARS, the following outlines interim guidance for the management of exposures to SARS in a health-care facility.

### **Surveillance of Health-Care Personnel**

Surveillance of health-care personnel is necessary to ensure that workers who are ill receive appropriate care and are isolated to prevent transmission. Health-care facilities that care for SARS patients should

implement surveillance of health-care workers who have any contact with SARS patients or their environment of care. Recommendations for surveillance include:

- Develop and maintain a listing of all personnel who enter the rooms of SARS patients, or who are involved in the patient's care in other parts of the hospital.
- Instruct personnel who have contact with SARS patients or their environment of care to notify occupational health, infection control or their designee if they have unprotected exposure to a SARS patient or if they develop any fever or respiratory symptoms.
- Monitor employee absenteeism for increases that may suggest emerging respiratory illness in the workforce. Notify local and state health authorities of clusters or unusual increases in respiratory illness, including atypical pneumonia.

### **Management of Asymptomatic, Exposed Health-Care Workers**

1. To date, there is no evidence to suggest that SARS is transmitted from asymptomatic individuals. However, according to recent reports health-care workers who developed SARS may have been a source of transmission within health-care facilities during the early phases of illness when symptoms were mild and not recognized as SARS. To minimize the risk of transmission from unrecognized SARS infections among health-care workers, health-care workers who have **unprotected high-risk exposures** to SARS should be excluded from duty (e.g. administrative leave) for 10 days following the exposure. Unprotected high-risk exposure is defined as presence in the same room as a probable SARS patient (see the above section entitled "[Description and Case Definition](#)") during a high-risk aerosol-generating procedure or event and where recommended infection control precautions (see the section below entitled "[Aerosol-generating procedures on suspected SARS patients](#)") are either absent or breached. Aerosol-generating procedures or events include aerosolized medication treatments, diagnostic sputum induction, bronchoscopy, endotracheal intubation, airway suctioning, positive pressure ventilation via facemask (e.g., BiPAP, CPAP), during which air may be forced out around the facemask, and high frequency oscillatory ventilation (HFOV). Health-care workers who are excluded from duty because of their exposure need not limit their activities outside of the healthcare setting, but should undergo active surveillance for symptoms, including measurement of body temperature twice daily and monitoring for respiratory symptoms for 10 days following exposure.
2. Health-care workers who have other unprotected exposures to patients with SARS need not be excluded from duty because of their exposure and need not limit their activities outside of the healthcare setting, but should undergo active surveillance for symptoms, including measurement of body temperature twice daily and monitoring for respiratory symptoms for 10 days following exposure.
3. Health-care workers who have cared for or otherwise been exposed to SARS patients while adhering to recommended infection control precautions should be instructed to be vigilant for fever and respiratory symptoms, including measurement of body temperature at least twice daily for 10 days following the last exposure to a SARS patient. These health-care workers should be contacted by occupational health, infection control or their designee regularly over the 10-day period following exposure to inquire about fever or respiratory symptoms.

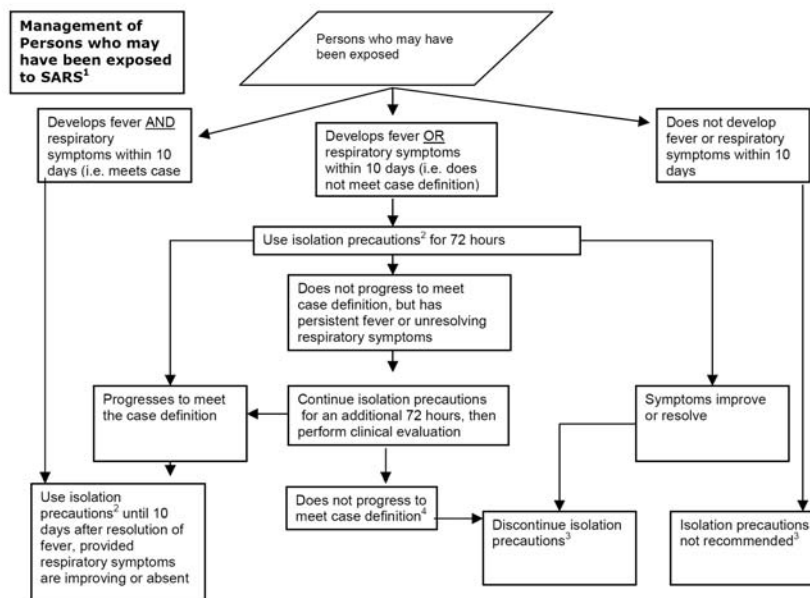
### **Management of Symptomatic, Exposed Health-Care Workers**

1. Any health-care worker who has cared for or been exposed to a SARS patient who develops fever OR respiratory symptoms within 10 days following exposure should not report for duty, but should stay home and report symptoms to the appropriate facility point of contact immediately. If

the symptoms begin while at work, the health-care worker should be instructed to immediately apply a surgical mask and leave the patient care area. Symptomatic health-care workers should use infection control precautions (see the section below entitled “[Households or residential settings](#)”) to minimize the potential for transmission and should seek health-care evaluation. **In advance of clinical evaluation health-care providers should be informed that the individual may have been exposed to SARS so arrangements can be made, as necessary, to prevent transmission to others in the health-care setting.**

2. If symptoms improve or resolve within 72 hours after first symptom onset, the person may be allowed after consultation with infection control and local public health authorities to return to duty and infection control precautions can be discontinued.
3. For persons who meet or progress to meet the case definition for SARS (e.g., develop fever and respiratory symptoms), infection control precautions should be continued until 10 days after the resolution of fever, provided respiratory symptoms are absent or improving.
4. If the illness does not progress to meet the case definition, but the individual has persistent fever\* or unresolving respiratory symptoms, infection control precautions should be continued for an additional 72 hours, at the end of which time a clinical evaluation should be performed. If the illness progresses to meet the case definition, infection control precautions should be continued as described above. If case definition criteria are not met, infection control precautions can be discontinued after consultation with local public health authorities and the evaluating clinician (see the figure below). Factors that might be considered include the nature of the potential exposure to SARS, nature of contact with others in the residential or work setting, and evidence for an alternative diagnosis.

**Interim Domestic Guidance for Management of Exposures to Severe Acute Respiratory Syndrome (SARS) for Health-Care and Other Institutional Settings**  
(continued from previous page)



<sup>1</sup>Exposure includes travel from areas with documented or suspected community transmission of SARS ([www.cdc.gov/ncidod/sars/casedefinition.htm](http://www.cdc.gov/ncidod/sars/casedefinition.htm)) or close contact with persons who have SARS; Close contact is defined as having cared for or lived with a person known to have SARS or having a high likelihood of direct contact with respiratory secretions and/or body fluids of a patient known to have SARS. Examples of close contact include kissing or embracing, sharing eating or drinking utensils, close conversation (<3 feet), physical examination, and any other direct physical contact between persons. Close contact does not include activities such as walking by a person or sitting across a waiting room or office for a brief period of time.

<sup>2</sup>Isolation precautions include limiting patient’s interactions with others outside the home (e.g. should not go to work, school, out of home day care, church or other public areas), and following infection control guidelines for the home or residential setting ([www.cdc.gov/ncidod/sars/ic-closecontacts.htm](http://www.cdc.gov/ncidod/sars/ic-closecontacts.htm)) if not admitted to hospital for care.

<sup>3</sup>Persons need not limit interactions outside of home (e.g., need not be excluded from work, school, out of home day care, church or other public areas).

<sup>4</sup>Discontinuation of isolation precautions for patients who have not met the case definition 6 days following onset of symptoms, but who have persistent fever or respiratory symptoms should be done only after consultation with local public health authorities and the evaluating clinician. Factors that might be considered include the nature of the potential exposure to SARS, nature of contact with others in the residential or work setting, and evidence for an alternative diagnosis.

5. Persons who meet or progress to meet the case definition for suspected SARS (e.g., develop fever and respiratory symptoms) or whose illness does not meet the case definition, but who have persistent fever or unresolving respiratory symptoms over the 72 hours following onset of symptoms should be tested for SARS coronavirus infection. Collection of appropriate specimens for laboratory testing should be coordinated with and guided by local/state public health authorities and consultation with CDC. (See the above section entitled "[Diagnostic Testing/Specimen Collection for Potential Cases of SARS.](#)")

### **Prevention of Unprotected Exposures**

Prevention of unprotected exposures will limit the need for exclusion from duty. Health-care facilities should address the following:

- Review current procedures for early detection and isolation of suspect SARS patients
- Educate all health-care personnel on signs and symptoms of SARS and recommended infection control practices
- Review use of personal protective equipment with health-care personnel, including physicians, who may care for SARS patients
- Follow current CDC recommendation for aerosol-generating procedures in suspected or probable SARS patients

### **Management of Symptomatic, Exposed Visitors**

Close contacts (e.g., family members) of SARS patients are at risk for infection. Close contacts with either fever or respiratory symptoms should not be allowed to enter the health-care facility as visitors and should be educated about this policy. A system for screening SARS close contacts who are visitors to the facility for fever or respiratory symptoms should be in place. Health-care facilities should educate all visitors about use of infection control precautions when visiting SARS patients and their responsibility for adherence to them.

\*Clinical judgment should be used when evaluating patients for whom a measured temperature of  $>100.4^{\circ}\text{F}$  ( $>38^{\circ}\text{C}$ ) has not been documented. Factors that might be considered include patient self-report of fever, use of antipyretics, presence of immunocompromising conditions or therapies, lack of access to health care, or inability to obtain a measured temperature. Reporting authorities might consider these factors when determining whether infection control precautions should be continued.

### **Pre-hospital emergency medical care and transport of SARS patients** [April 29, 2003]

#### **Pre-Hospital Emergency Medical Care and Ground Transport of Suspected SARS Patients**

The current SARS outbreak has required ground emergency medical services (EMS) to move patients to medical facilities for further assessment and care. This guidance is intended to assist Emergency Medical Services (EMS) providers to manage suspected SARS patients while ensuring the safety of patients and transport personnel. These interim recommendations are based on standard infection control practices and available epidemiologic information regarding the transmission of SARS.

Currently recommended infection control measures (see <http://www.cdc.gov/ncidod/sars/ic.htm>) for hospitalized patients with SARS include Standard Precautions (with eye protection to prevent droplet exposure), plus Contact and Airborne Precautions. Respiratory protection using respirators providing at least 95% filtering efficiency (e.g., N-95) with appropriate fit-testing is recommended (see

<http://www.osha.gov/SLTC/etools/respiratory/oshfiles/fittesting1.html>). The following guidelines are adapted from these recommendations.

I. Emergency medical ground transport of SARS patients, general considerations

- Suspected SARS patients should be transported using the minimum number of EMS personnel and without non-SARS patients or passengers in the vehicle.
- Receiving facilities must be notified prior to arrival of suspected SARS patients to facilitate preparation of appropriate infection control procedures and facilities.
- Concerns regarding movement of possible SARS patients in the United States should be discussed with appropriate local, state and federal health authorities, including CDC (24 hour response number: 770/488-7100).

II. Infection Control

General

- In addition to respiratory droplet and possible airborne spread, SARS may be transmitted if residual infectious particles on environmental surfaces are brought into direct contact with the eyes, nose or mouth, e.g., by unwashed hands. Therefore, hand hygiene (see <http://www.cdc.gov/handhygiene/>) is of primary importance for all personnel working with possible SARS patients.
- Protective equipment should be used throughout transport of a suspected SARS patient.
- Personal activities (including: eating, drinking, application of cosmetics, and handling of contact lenses) should not be performed during patient transport.

Protective equipment and procedures

- Disposable, non-sterile gloves must be worn for all patient contact.
- Gloves should be removed and discarded in biohazard bags after patient care is completed (e.g., between patients) or when soiled or damaged.
- Hands must be washed or disinfected with a waterless hand sanitizer immediately after removal of gloves.
- Disposable fluid-resistant gowns should be worn for all direct patient care.
- Gowns should be removed and discarded in biohazard bags after patient care is completed or when soiled or damaged.
- Eye-protection must be worn in the patient-care compartment and when working within 6 feet of the patient. Corrective eyeglasses alone are not appropriate protection.
- N-95 (or greater) respirators should be worn by personnel in the patient-care compartment during transport of a suspected SARS patient; personnel wearing respirators should be fit tested.
- The door/window between driver and patient compartments should be closed before a suspected SARS patient is brought onboard. N-95 (or greater) respirators should be worn by the driver if the driver's compartment is open to the patient-care compartment. Drivers

that provide direct patient care (including moving patients on stretchers) should wear a disposable gown, eye-protection, and gloves as described above during patient-care activities. Gowns and gloves are not required for personnel whose duties are strictly limited to driving.

- Vehicles that have separate driver and patient compartments and can provide separate ventilation to these areas are preferred for transport of possible SARS patients. If a vehicle without separate compartments and ventilation must be used, the outside air vents in the driver compartment should be open, and the rear exhaust ventilation fans should be turned on at the highest setting during transport of SARS patients to provide relative negative pressure in the patient care compartment.
- Oxygen delivery with non-rebreather facemasks may be used for patient oxygen support during transport.
- The patient may wear a paper surgical mask to reduce droplet production, if tolerated.
- Positive pressure ventilation should be performed using a resuscitation bag-valve mask, preferably one equipped to provide HEPA or equivalent filtration of expired air.
- Cough-generating procedures should be avoided during pre-hospital care (e.g., nebulizer treatments).

### III. Mechanically Ventilated Patients

- EMS organizations should consult their ventilator equipment manufacturer to confirm appropriate filtration capability and the effect of filtration on positive pressure ventilation.
- Mechanical ventilators for SARS-patient transport should provide HEPA or equivalent filtration of airflow exhaust.

### IV. Clinical Specimens

- Standard precautions must be used when collecting and transporting clinical specimens.
- Clinical specimens should be labeled with appropriate patient information and placed in a clean self-sealing bag for storage and transport.

### V. Waste disposal

- Dry solid waste, e.g., used gloves, dressings, etc., should be collected in biohazard bags for disposal as regulated medical waste in accordance with local requirements at the destination hospital.
- Waste that is saturated with blood, body fluids, or excreta should be collected in leak-proof biohazard bags or containers for disposal as regulated medical waste in accordance with local requirements at the destination hospital.
- Sharp items such as used needles or scalpel blades should be collected in puncture resistant sharps containers for disposal as regulated medical waste in accordance with local requirements at the destination hospital.
- Suctioned fluids and secretions should be stored in sealed containers for disposal as regulated medical waste in accordance with local requirements at the destination hospital. Handling that might create splashes or aerosols during transport should be avoided.



- Suction devices should be fitted with in-line HEPA or equivalent filters in accordance with manufacturer's recommendations.

VI. Cleaning and Disinfection after transporting a possible SARS patient

- Compressed air that might re-aerosolize infectious material should not be used for cleaning the vehicle or reusable equipment.
- Non-patient-care areas of the vehicle should be cleaned and maintained according to vehicle manufacturer's recommendations.
- Personnel performing cleaning should wear non-sterile gloves, disposable gowns and eye-protection while cleaning the patient-care compartment.
- Patient-care compartments (including stretchers, railings, medical equipment, control panels, and adjacent flooring, walls and work surfaces likely to be directly contaminated during care) should be cleaned using an EPA-registered hospital disinfectant in accordance with manufacturer's recommendations.
- Spills of body fluids during transport should be cleaned by placing absorbent material over the spill and collecting the used cleaning material in a biohazard bag. The area of the spill should be cleaned using an EPA-registered hospital disinfectant. Cleaning personnel should be notified of the spill location and initial clean up performed.
- Contaminated reusable patient care equipment should be cleaned and disinfected promptly after use and before returning to service.
- Personnel should wear non-sterile gloves, disposable gowns and face shields while cleaning reusable equipment.
- Reusable equipment should be cleaned and disinfected according to manufacturer's instructions.

VII. Follow-up of EMS personnel who transport suspected SARS patients

- Personnel who have transported a suspected SARS patient and develop symptoms of SARS within the 10 day post-exposure period should be directed to seek medical evaluation and should be reported to the state health department (800/392-0272) and to CDC at the number listed above.
- Personnel may continue working during the 10-day post-exposure period if they have no symptoms of fever or respiratory illness.

**Interim Guidance: Air Medical Transport for SARS Patients**

CDC has issued guidance to assist air medical transport (AMT) service providers using specialized aircraft to transport SARS patients while ensuring the safety of patients and transport personnel. This guidance is available at <http://www.cdc.gov/ncidod/sars/airtransport-sarspatients.htm>.

**Use of respirators to prevent transmission of SARS** [May 6, 2003]

The transmission of SARS appears to occur predominantly by direct contact with infectious material, including dispersal of large respiratory droplets. However, it is also possible that SARS can be spread



through the airborne route. Accordingly, CDC has recommended the use of N95 respirators, consistent with respiratory protection for airborne diseases, such as tuberculosis.

SARS, unlike tuberculosis, also appears to spread by direct contact with respiratory secretions, which makes touching contaminated objects a potential concern. Although reaerosolization of infectious material is unlikely under normal use conditions, infectious material deposited on a respirator may cause it to become a vehicle for direct or indirect transmission. Therefore, additional infection control measures applicable to this specific situation are needed.

This interim guidance provides information on the selection and handling of respirators for SARS and includes guidance for when respirators are either not available or in short supply.

1. A NIOSH-certified, disposable N95 respirator is sufficient for routine airborne isolation precautions. Use of a higher level of respiratory protection may be considered for certain aerosol-generating procedures (see the section below entitled "[Aerosol-generating procedures on suspected SARS patients](#)").
  - a. Respirators should be used in the context of a complete respiratory protection program in accordance with OSHA regulations. This includes training and fit testing to ensure a proper seal between the respirator's sealing surface and the wearer's face. Detailed information on respirator programs, including fit test procedures can be accessed at [www.osha.gov/SLTC/etools/respiratory](http://www.osha.gov/SLTC/etools/respiratory).
  - b. Once worn in the presence of a SARS patient, the respirator should be considered potentially contaminated with infectious material, and touching the outside of the device should be avoided. Upon leaving the patient's room, the disposable respirator should be removed and discarded, followed by hand hygiene.
2. If a sufficient supply of respirators is not available, healthcare facilities may consider reuse as long as the device has not been obviously soiled or damaged (e.g., creased or torn). Data on reuse of respirators for SARS are not available. Reuse may increase the potential for contamination; however, this risk must be balanced against the need to fully provide respiratory protection for healthcare personnel.

If N95 respirators are reused for contact with SARS patients, implement a procedure for safer reuse to prevent contamination through contact with infectious droplets on the outside of the respirator.

- a. Consider wearing a loose-fitting barrier that does not interfere with fit or seal (e.g., surgical mask, face shield) over the respirator.
- b. Remove the barrier upon leaving the patient's room and perform hand hygiene. Surgical masks should be discarded; face shields should be cleaned and disinfected.
- c. Remove the respirator and either hang it in a designated area or place it in a bag. (Consider labeling respirators with a user's name before use to prevent reuse by another individual.)

- d. Use care when placing a used respirator on the face to ensure proper fit for respiratory protection and to avoid contact with infectious material that may be present on the outside of the mask.
  - e. Perform hand hygiene after replacing the respirator on the face.
3. When elastomeric (rubber) or powered air purifying respirators (PAPRs) are used, their reusable elements should be cleaned and disinfected after use, in accordance with manufacturer's recommendations. When half- or full-facepiece elastomeric negative pressure respirators are used by more than one individual, filters should be replaced between individual users. When PAPRs are used, the filters should be replaced following manufacturer's recommendations. All used filters must be safely discarded.
  4. Respiratory protective devices with a filter efficiency of 95% or greater (e.g., N95, N99, N100) may not be available in some settings due to supply shortages or other factors. In this situation, a surgical (procedure) mask should be worn. Surgical masks will provide barrier protection against large droplets that are considered to be the primary route of SARS transmission. However, surgical masks may not adequately protect against aerosol or airborne particles, primarily because they allow for leakage around the mask and cannot be fit tested. The mask should resist fluid penetration and fit tightly around the mouth and nose when properly applied to the face.
  5. Hand hygiene is urged for all contact with suspect SARS patients or objects that may be contaminated with the virus that causes SARS, including hand washing with soap and water; if hands are not visibly soiled, alcohol-based hand rubs may be used as an alternative to hand washing.
  6. For additional technical information regarding respirators, see the web site of the NIOSH National Personal Protective Technology Laboratory at <http://www.cdc.gov/niosh/npptl/default.html>, or call 1-412-386-4000. See also the NIOSH web site entitled "Understanding Respiratory Protection Against SARS" at <http://www.cdc.gov/niosh/npptl/respirators/respsars.html>.

#### **Aerosol-generating procedures on suspected SARS patients** [May 20, 2003]

Worldwide, several health-care workers (HCWs) have been reported to develop SARS after caring for patients with SARS. Multiple hospitals have reported cases among HCWs who were present during aerosol-generating procedures performed on patients with SARS, suggesting that aerosol-generating procedures may increase the risk of SARS transmission.

Procedures capable of stimulating cough and promoting the generation of aerosols include: administration of aerosolized medication treatment; diagnostic sputum induction; bronchoscopy; airway suctioning; endotracheal intubation; positive pressure ventilation via facemask (e.g., BiPAP, CPAP), during which air may be forced out around the facemask; and high frequency oscillatory ventilation (HFOV). CDC is recommending healthcare facilities to review their strategies to protect HCWs during these procedures, including the use of personal protective equipment and safe work practices, and to alert HCWs performing such procedures that there may be an increased risk for transmission of SARS.

The following recommendations apply to the performance of aerosol-generating procedures in patients with suspect or probable SARS. These recommendations should be considered interim in nature, and may be revised as more information becomes available.

**Limit opportunities for exposure.**

- Limit the use of aerosol-generating procedures on SARS patients to those that are deemed medically necessary. Use clinically appropriate sedation during intubation and bronchoscopy to minimize resistance and coughing during the procedure.
- Limit the number of HCWs present in the room during an aerosol-generating procedure to those who are essential for patient care and support.

**Perform aerosol-generating procedures in an airborne isolation environment**

- If the patient is in an airborne isolation room, perform the procedure in that environment.
- If an airborne isolation room is not available, the procedure should be performed in a private room, away from other patients. If possible, steps should be taken to increase air exchanges, create a negative pressure relative to the adjacent room or hallway, and avoid recirculation of the room air. If recirculation of air from such rooms is unavoidable, the air should be passed through a HEPA filter before recirculation as recommended for *Mycobacterium tuberculosis* (see the CDC guidelines at <http://www.cdc.gov/mmwr/preview/mmwrhtml/00035909.htm>). Air cleaning devices such as portable HEPA filtration units may be used to further reduce the concentration of contaminants in the air. Doors should be kept closed except when entering or leaving the room, and entry and exit should be minimized during the procedure.

**Use of filters on ventilation exhaust valves.**

- Some hospitals caring for SARS patients have used bacterial/viral filters on exhalation valves of mechanical ventilators to prevent contaminated aerosols from entering the environment. Although the effectiveness of this measure in reducing the risk of SARS transmission is unknown, the use of such filters may be prudent during HFOV of patients with SARS.

**Wear personal protective equipment appropriate for standard, contact and airborne precautions with consideration for additional personal protection based on the potential for higher level of contact with respiratory secretions**

The optimal combination of personal protective equipment (PPE) for preventing transmission of SARS during aerosol-generating procedures has not been determined. PPE must cover the arms and torso, and fully protect the eyes, nose and mouth; additional PPE to protect all exposed areas of skin should be considered. The following personal protective equipment is recommended for those present during aerosol-generating procedures on patients with SARS:

- Single isolation gown to protect the body and exposed areas of the arms. A disposable full-body isolation suit may be considered in this setting as it provides greater protection for the neck area; some suits also have an attached hood to cover the hair. Another alternative for providing full head, neck, face and respiratory protection is a disposable surgical hood with an attached face shield in combination with a disposable respirator. It is unknown whether covering exposed areas of skin or hair of the head and neck will further reduce the risk of transmission.
- A single pair of disposable gloves that provide a snug fit over the wrist.
- Eye protection consisting of goggles should be worn to protect the eyes from respiratory splash or spray. Goggles should fit snugly around the eyes.

- A face shield may be worn over goggles to protect exposed areas of the face but should not be used as a primary form of eye protection for these procedures.
- Respiratory protection for aerosol-generating procedures must ensure that HCWs are protected from exposure to aerosolized infectious droplets through breaches in respirator seal integrity. Healthcare facilities should consider the following options:
  - Disposable particulate respirators (e.g. N-95, N-99, or N-100) are sufficient for routine respiratory protection for airborne precautions and are the minimum level of respiratory protection for HCWs who are performing aerosol-generating procedures. To ensure adequate protection, HCWs must be fit-tested to the respirator model that they will wear (see *TB Respiratory Protection Program In Health Care Facilities: Administrator's Guide* at <http://www.cdc.gov/niosh/99-143.html>), and also know how to check their facepiece seal. A fit-check should be performed each time the respirator is put on, prior to entering the patient room. If disposable respirators cannot be fit-tested to the individual, a higher level of respiratory protection should be used.
  - Healthcare facilities in some SARS affected areas have used higher levels of respiratory protection for persons present during aerosol-generating procedures on SARS patients. Higher levels of respiratory protection include:
    - Powered air purifying respirator (PAPRs) designed with loose-fitting facepieces that form a partial seal with the face;
    - PAPRs with hoods that completely cover the head and neck and may also cover portions of the shoulder and torso;
    - PAPRs with tight-fitting facepieces (both half and full facepiece);
    - Full facepiece elastomeric negative pressure (i.e. non-powered) respirators with N, R, or P100 filters.

At this time there is inadequate information to determine whether these higher levels of respiratory protection will further reduce transmission. Factors that should be considered in choosing respirators in this setting include availability, impact on mobility, comfort, (see *TB Respiratory Protection Program In Health Care Facilities: Administrator's Guide* at <http://www.cdc.gov/niosh/99-143.html>), the potential for exposure to higher levels of aerosolized respiratory secretions, and the potential for reusable respirators to serve as fomites for transmission.

All HCWs offered respiratory protection must be included in a respiratory protection program that meets the minimum requirements of the OSHA Respiratory Protection Standard (29CFR1910.134) if within the U.S., or other applicable requirements for workplaces outside the U.S.

#### **Safe work practices**

- HCWs must be careful to contain the area of contamination. Aerosol-generating procedures may produce high concentrations of virus in the air and on environmental surfaces. HCWs should avoid touching their face and personal protective equipment on their face with contaminated gloves. They also should avoid contaminating surfaces around the patient and room.
- HCWs should use care when removing personal protective equipment to avoid contaminating skin, clothing, and mucous membranes. Standard procedures for removal of personal protective

equipment that minimize the potential for self-contamination should be developed based on the equipment used, and healthcare workers should be trained in these procedures.

- Hand hygiene should be performed following the removal of PPE and leaving the patient's room.

#### **Decontaminating, cleaning, and disinfecting personal protective equipment and environmental surfaces**

- A disinfectant should be available for decontaminating reusable personal protective equipment. Clean gloves should be worn when wiping surfaces of equipment to render them safe for handling. Manufacturer's guidelines for cleaning and disinfection of reusable protective equipment should be followed.
- Horizontal surfaces in the environment around the patient should be cleaned and disinfected as soon as possible following an aerosol-generating procedure (see the above section entitled "[Cleaning and Disinfection of the SARS Patient Environment](#)").

#### **Laboratory biosafety guidelines for handling/processing SARS specimens** [April 16, 2003]

It is estimated that several thousand diagnostic specimens from patients with SARS have been processed in routine clinical laboratories throughout the world and to date there have been no reported clusters of SARS illness among laboratory workers. Nonetheless, until more information about the transmission of the SARS agent in the laboratory setting is known, reasonable precautions should be taken in handling these specimens. Effective and timely communication between clinical and laboratory staff is essential in minimizing the risk incurred in handling specimens from patients in whom SARS is suspected.

Specimens from patients with suspected SARS should be labeled accordingly and the laboratory should be alerted to insure proper specimen handling. Listed below are interim biosafety guidelines from CDC for handling these specimens. A detailed description of recommended facilities, practices, and protective equipment for the various laboratory biosafety levels (BSLs) given below may be found in the CDC/NIH Biosafety in Microbiological and Biomedical Laboratories manual (BMBL), available at <http://www.cdc.gov/od/ohs/biosfty/bmb14/bmb14s3.htm>.

#### **A. Blood and Urine Specimens**

These specimens may be handled using Standard Precautions (previously Universal Precautions) in BSL-2 laboratories. Laboratory workers should wear protective equipment, including disposable gloves, laboratory coats, eye protection and a surgical mask, or face shield to provide a barrier to mucosal surface exposure. Careful attention should be given to hand hygiene after removal of gloves and especially before touching the eyes or mucosal surfaces.

Any procedure with the potential to generate fine particulate aerosols (e.g. vortexing or sonication of specimens in an open tube) should be performed in a biological safety cabinet (BSC). The use of sealed centrifuge rotors or sample cups, if available, should be employed for centrifugation. Ideally, these rotors or cups should be unloaded in a BSC.

Procedures performed outside of a BSC should be performed in a manner that minimizes the risk of exposure to an inadvertent sample release.

Work surfaces and equipment should be decontaminated after specimens are processed. Standard decontamination agents that are effective against lipid-enveloped viruses should be sufficient.

If the safety equipment described above is not available, administrative measures and/or additional personal protective equipment may be employed to reduce risk. This should be done in

the context of a careful risk assessment by the laboratory safety officer. For example, the workflow of the laboratory may be adjusted so that a minimum number of workers are present during centrifugation.

Consideration may be given to implementing respiratory protection for workers for use during centrifugation or other procedures with increased potential for inadvertent sample release. Acceptable methods of respiratory protection include a properly fit tested NIOSH approved filter respirator (N-95 or higher); or powered air-purifying respirators (PAPRs) equipped with high efficiency particulate air (HEPA) filters. Accurate fit testing is a key component of effective respirator use. Personnel who cannot wear fitted respirators because of facial hair or other fit-limitations should wear loose fitting hooded or helmeted PAPRs.

Consideration may also be given to referral of specimens to a suitably equipped reference laboratory.

## **B. Other Specimens:**

1. The following activities may be performed in BSL-2 facilities with standard BSL-2 work practices:
  - a. Pathologic examination and processing of formalin-fixed or otherwise inactivated tissues.
  - b. Molecular analysis of extracted nucleic acid preparations.
  - c. Electron microscopic studies with glutaraldehyde-fixed grids.
  - d. Routine examination of bacterial and mycotic cultures.
  - e. Routine staining and microscopic analysis of fixed smears.
  - f. Final packaging of specimens for transport to diagnostic laboratories for additional testing. Specimens should already be in a sealed, decontaminated primary container.
2. Activities involving manipulation of untreated specimens may be performed in BSL-2 facilities, but with more stringent BSL-3 work practices. Laboratory workers should wear protective equipment, including disposable gloves, solid front gowns with cuffed sleeves, and full-face protection. Specimen manipulations should be carried out in a certified biological safety cabinet. When a procedure or process cannot be conducted within a biological safety cabinet, then appropriate combinations of personal protective equipment (e.g., respirators, face shields) and physical containment devices (e.g., centrifuge safety cups or sealed rotors) must be used. Acceptable methods of respiratory protection include a properly fit tested NIOSH approved filter respirator (N-95 or higher); or powered air-purifying respirators (PAPRs) equipped with high efficiency particulate air (HEPA) filters. Accurate fit testing is a key component of effective respirator use. Personnel who cannot wear fitted respirators because of facial hair or other fit-limitations should wear loose fitting hooded or helmeted PAPRs. Centrifugation should be carried out using sealed centrifuge cups or rotors that are unloaded in a biological safety cabinet.

Examples of these activities include:

- a. Aliquoting and/or diluting specimens
- b. Inoculation of bacterial or mycological culture media.

- c. Performing diagnostic tests that don't involve propagation of viral agents in vitro or in vivo.
  - d. Nucleic acid extraction procedures involving untreated specimens
  - e. Preparation and chemical- or heat-fixing of smears for microscopic analysis.
3. The following activities require BSL-3 facilities and BSL-3 work practices. When a procedure or process cannot be conducted within a biological safety cabinet, then appropriate combinations of personal protective equipment (e.g., respirators, face shields) and physical containment devices (e.g., centrifuge safety cups or sealed rotors) **must** be used.
- a. Viral cell culture
  - b. Initial characterization of viral agents recovered in cultures of SARS specimens.
4. The following activities require Animal BSL-3 facilities and Animal BSL-3 work practices:
- a. Inoculation of animals for potential recovery of the agent from SARS samples.
  - b. Protocols involving animal inoculation for characterization of putative SARS agents.

Packaging, shipping and transport of specimens from suspect and probable SARS cases must follow the current edition of the International Air Transport Association (IATA) Dangerous Goods Regulations (available at <http://www.iata.org/dangerousgoods/index>) and US DOT 49 CFR Parts 171-180 (available at <http://hazmat.dot.gov/rules.htm>). Step-by-step instructions on appropriate packaging and labeling can be viewed at <http://www.cdc.gov/ncidod/sars/pdf/packingspecimens-sars.pdf>.

### **Handling of human remains of SARS patients** [May 15, 2003]

All postmortem procedures require adherence to standard precautions with use of appropriate personal protective equipment (PPE) and facilities with appropriate safety features. Mechanical devices used during autopsies can efficiently generate fine aerosols that may contain infectious organisms. Thus, PPE should include both protective garments and respiratory protection as outlined below.

#### **Personal protective equipment**

For autopsies and postmortem assessment of SARS cases, PPE should include:

- **Protective garments:** surgical scrub suit, surgical cap, impervious gown or apron with full sleeve coverage, eye protection (e.g., goggles or face shield), shoe covers and double surgical gloves with an interposed layer of cut-proof synthetic mesh gloves.
- **Respiratory protection:** N-95 or N-100 respirators; or powered air-purifying respirators (PAPR) equipped with a high efficiency particulate air (HEPA) filter. PAPR is recommended for any procedures that result in mechanical generation of aerosols, e.g., use of oscillating saws. Autopsy personnel who cannot wear N-95 respirators because of facial hair or other fit-limitations should wear PAPR.

#### **Autopsy procedures**

For autopsies and postmortem assessment of SARS cases, safety procedures should include:

- **Prevention of percutaneous injury:** including never recapping, bending or cutting needles, and ensuring that appropriate sharps containers are available.



- **Handling of protective equipment:** protective outer garments must be removed when leaving the immediate autopsy area and discarded in appropriate laundry or waste receptacles, either in an antechamber to the autopsy suite or immediately inside the entrance if an antechamber is not available. Hands should be washed upon glove removal.

#### Engineering strategies and facility design

- **Air handling systems:** autopsy suites must have adequate air-exchanges per hour and correct directionality and exhaust of airflow. Autopsy suites should have a minimum of 12 air-exchanges per hour and should be at a negative pressure relative to adjacent passageways and office spaces. Air should not be returned to the building interior, but should be exhausted outdoors, away from areas of human traffic or gathering spaces (e.g., off the roof) and away from other air intake systems. For autopsies, local airflow control (i.e., laminar flow systems) can be used to direct aerosols away from personnel; however, this safety feature does not remove the need for appropriate personal protective equipment.
- **Containment devices:** biosafety cabinets should be available for handling and examination of smaller specimens. Oscillating saws are available with vacuum shrouds to reduce the amount of particulate and droplet aerosols generated. These devices should be used whenever possible to decrease the risk of occupational infection.

#### Households or residential settings [April 29, 2003]

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. Household members in contact with the patient should be reminded of the need for careful hand hygiene including hand washing with soap and water; if hands are not visibly soiled, alcohol-based handrubs may be used as an alternative to hand washing. More detailed recommendations are the following:

Patients with SARS pose a risk of transmission to close household contacts and health care personnel in close contact. The duration of time before or after onset of symptoms during which a patient with SARS can transmit the disease to others is unknown. The following infection control measures are recommended for patients with suspected SARS in households or residential settings. These recommendations are based on the experience in the U.S. to date and may be revised as more information becomes available.

1. SARS patients should limit interactions outside the home and should not go to work, school, out-of-home child care, or other public areas until 10 days after the resolution of fever, provided respiratory symptoms are absent or improving. During this time, infection control precautions should be used, as described below, to minimize the potential for transmission.
2. All members of a household with a SARS patient should carefully follow recommendations for hand hygiene (e.g., frequent hand washing or use of alcohol-based hand rubs), particularly after contact with body fluids (e.g., respiratory secretions, urine, or feces). See <http://www.cdc.gov/handhygiene/> for more details on hand hygiene.
3. Use of disposable gloves should be considered for any direct contact with body fluids of a SARS patient. **However, gloves are not intended to replace proper hand hygiene.** Immediately after activities involving contact with body fluids, gloves should be removed and discarded and hands should be cleaned. Gloves must never be washed or reused.

4. Each patient with SARS should be advised to cover his or her mouth and nose with a facial tissue when coughing or sneezing. If possible, a SARS patient should wear a surgical mask during close contact with uninfected persons to prevent spread of infectious droplets. When a SARS patient is unable to wear a surgical mask, household members should wear surgical masks when in close contact with the patient.
5. Sharing of eating utensils, towels, and bedding between SARS patients and others should be avoided, although such items can be used by others after routine cleaning (e.g., washing with soap and hot water). Environmental surfaces soiled by body fluids should be cleaned with a household disinfectant according to manufacturer's instructions; gloves should be worn during this activity.
6. Household waste soiled with body fluids of SARS patients, including facial tissues and surgical masks, may be discarded as normal waste.
7. Household members and other close contacts of SARS patients should be actively monitored by the local health department for illness.
8. Household members or other close contacts of SARS patients should be vigilant for the development of fever or respiratory symptoms and, if these develop, should seek healthcare evaluation. **In advance of evaluation, healthcare providers should be informed that the individual is a close contact of a SARS patient so arrangements can be made, as necessary, to prevent transmission to others in the healthcare setting.** Household members or other close contacts with symptoms of SARS should follow the same precautions recommended for SARS patients.
9. At this time, in the absence of fever or respiratory symptoms, household members or other close contacts of SARS patients need not limit their activities outside the home.

A CDC fact sheet entitled "Information For Close Contacts Of SARS Patients" is available at <http://www.cdc.gov/ncidod/sars/factsheetcc.htm>.

### **General Workplace Settings** [May 8, 2003]

Workers, who in the last 10 days have traveled to a known SARS area, or have had close contact with a co-worker or family member with suspected or probable SARS could be at increased risk of developing SARS and should be vigilant for the development of fever (greater than 100.4° F) or respiratory symptoms (e.g., cough or difficulty breathing). If these symptoms develop you should not go to work, school, or other public areas but should seek evaluation by a health-care provider and practice infection control precautions recommended for the home or residential setting (see the above section entitled "[Households or residential settings](#)"); **be sure to contact your health-care provider beforehand to let them know you may have been exposed to SARS so arrangements can be made, as necessary, to prevent transmission to others in the healthcare setting.** For more information about the signs and symptoms of SARS, please visit CDC's SARS website at <http://www.cdc.gov/ncidod/sars/>. More detailed guidance on management of symptomatic persons, who may have been exposed to SARS, such as how long one should avoid public areas, is available in the section below entitled "[Guidance for persons who may have been exposed to SARS patients](#)".

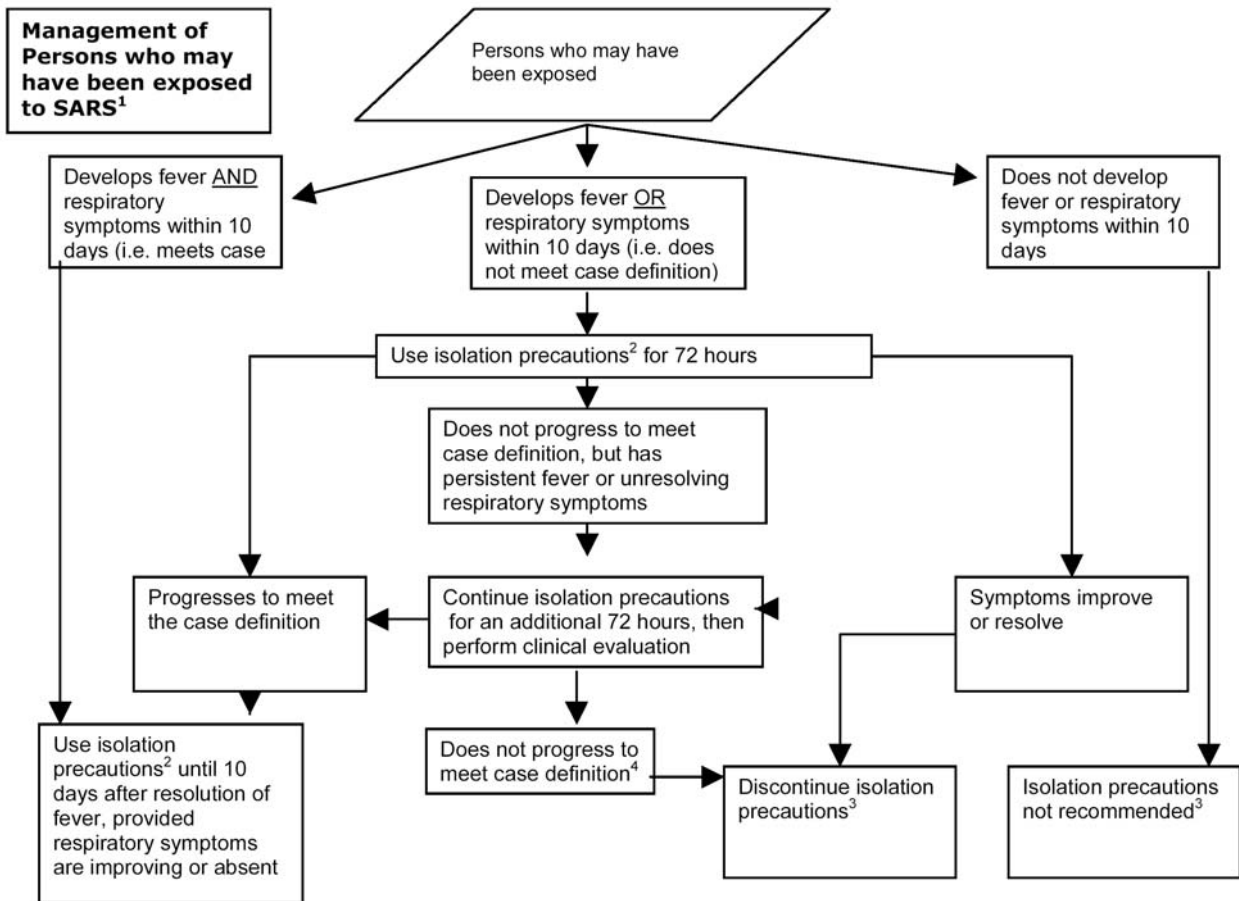
As with other infectious illnesses, one of the most important and appropriate preventive practices is careful and frequent hand hygiene. Cleaning your hands often using either soap and water or waterless alcohol-based hand sanitizers removes potentially infectious materials from your skin and helps prevent disease transmission.

The routine use of personal protective equipment (PPE) such as respirators, gloves, or, using surgical masks for protection against SARS exposure is currently not recommended in the general workplace (outside the health-care setting).

### **School students exposed to SARS** [May 7, 2003]

To date, most reported patients with SARS in the United States have been exposed through foreign travel to countries with community transmission of SARS (areas with community transmission can be found in the [case definition](#)), with only limited secondary spread to close contacts such as family members and health-care workers. Casual contact with a SARS patient at schools, other institutions, or public gatherings (e.g., attending the same class or public gathering) has not resulted in documented transmission in the United States. However, management of students exposed (i.e., through foreign travel or close contact) to SARS patients is a concern. The following are interim recommendations to assist health departments in the management of exposed students.

1. Students who may have been exposed to SARS should be vigilant for fever (i.e. measure temperature twice daily) and respiratory symptoms over the 10 days following exposure.\* During this time, in the absence of both fever and respiratory symptoms, students need not limit their activities outside the home and should not be excluded from school, or other public areas. However, the exposure should be reported to the appropriate points of contact (e.g., school officials and local health authorities).
2. Exposed students should notify school officials and their health-care provider immediately if fever OR respiratory symptoms develop. **In advance of clinical evaluation health-care providers should be informed that the student may have been exposed to SARS so arrangements can be made, as necessary, to prevent transmission to others in the health-care setting.**
3. Symptomatic students exposed to SARS should follow the following infection control precautions:
  - If fever OR respiratory symptoms develop, the student should not go to school or work, but should stay home while arranging health-care evaluation. In addition, the student should use infection control precautions in the home to minimize the risk for transmission (see the above section entitled "[Households or residential settings](#)"), and continue to measure temperature twice daily.
  - If a symptomatic exposed student lives in a residence where appropriate infection control precautions cannot be implemented and maintained (e.g., crowded dormitory setting), alternative housing arrangements should be made. If there is no such alternative, the student should be hospitalized, or housed in a designated residential facility for convalescing SARS patients, where infection control precautions can be followed.
  - If symptoms improve or resolve within 72 hours after first symptom onset, the student may be allowed after consultation with local public health authorities to return to school or work and infection control precautions can be discontinued (see the figure below).



1. Exposure includes travel from areas with documented or suspected community transmission of SARS (link to case definition) or close contact with persons who have SARS; Close contact is defined as having cared for or lived with a person known to have SARS or having a high likelihood of direct contact with respiratory secretions and/or body fluids of a patient known to have SARS. Examples of close contact include kissing or embracing, sharing eating or drinking utensils, close conversation (<3 feet), physical examination, and any other direct physical contact between persons. Close contact does not include activities such as walking by a person or sitting across a waiting room or office for a brief period of time.

2. Isolation precautions include limiting patient’s interactions with others outside the home (e.g. should not go to work, school, out of home day care, church or other public areas), and following infection control guidelines for the home or residential setting (link) if not admitted to hospital for care.

3. Persons need not limit interactions outside of home (e.g., need not be excluded from work, school, out of home day care, church or other public areas).

4. Discontinuation of isolation precautions for patients who have not met the case definition 6 days following onset of symptoms, but who have persistent fever or respiratory symptoms should be done only after consultation with local public health authorities and the evaluating clinician. Factors that might be considered include the nature of the potential exposure to SARS, nature of contact with others in the residential or work setting, and evidence for an alternative diagnosis.

- For students who meet or progress to meet the case definition for suspected SARS (e.g., develop fever and respiratory symptoms), infection control precautions should be continued until 10 days after the resolution of fever, provided respiratory symptoms are absent or improving.
  - If the illness does not progress to meet the case definition, but the student has persistent fever\*\* or unresolving respiratory symptoms, infection control precautions should be continued for an additional 72 hours, at the end of which time a clinical evaluation should be performed. If the illness progresses to meet the case definition, infection control precautions should be continued as described above. If case definition criteria are not met, infection control precautions can be discontinued after consultation with local public health authorities and the evaluating clinician (see the above figure). Factors that might be considered include the nature of the potential exposure to SARS, nature of contact with others in the residential or work setting, and evidence for an alternative diagnosis.
4. Students who meet or progress to meet the case definition for suspected SARS (e.g., develop fever and respiratory symptoms) or whose illness does not meet the case definition, but who have persistent fever or unresolving respiratory symptoms over the 72 hours following onset of symptoms should be tested for SARS coronavirus infection. Collection of appropriate specimens for laboratory testing (see the above section entitled “[Diagnostic Testing/Specimen Collection for Potential Cases of SARS](#)”) should be coordinated with and guided by local/state public health authorities and consultation with CDC.
  5. In a school that has a symptomatic exposed student in attendance during the 10 days following exposure, education concerning the symptoms of SARS and monitoring of potentially exposed students and school personnel should be conducted in consultation with the local health department.

\*Monitoring for signs and symptoms should be tailored to the specific school setting or age group. Some students may require assistance from parents or school officials in monitoring for signs of illness.

\*\*Clinical judgment should be used when evaluating patients for whom a measured temperature of  $>100.4^{\circ}\text{F}$  ( $>38^{\circ}\text{C}$ ) has not been documented. Factors that might be considered include patient self-report of fever, use of antipyretics, presence of immunocompromising conditions or therapies, lack of access to health care, or inability to obtain a measured temperature. Reporting authorities might consider these factors when determining whether infection control precautions should be continued.

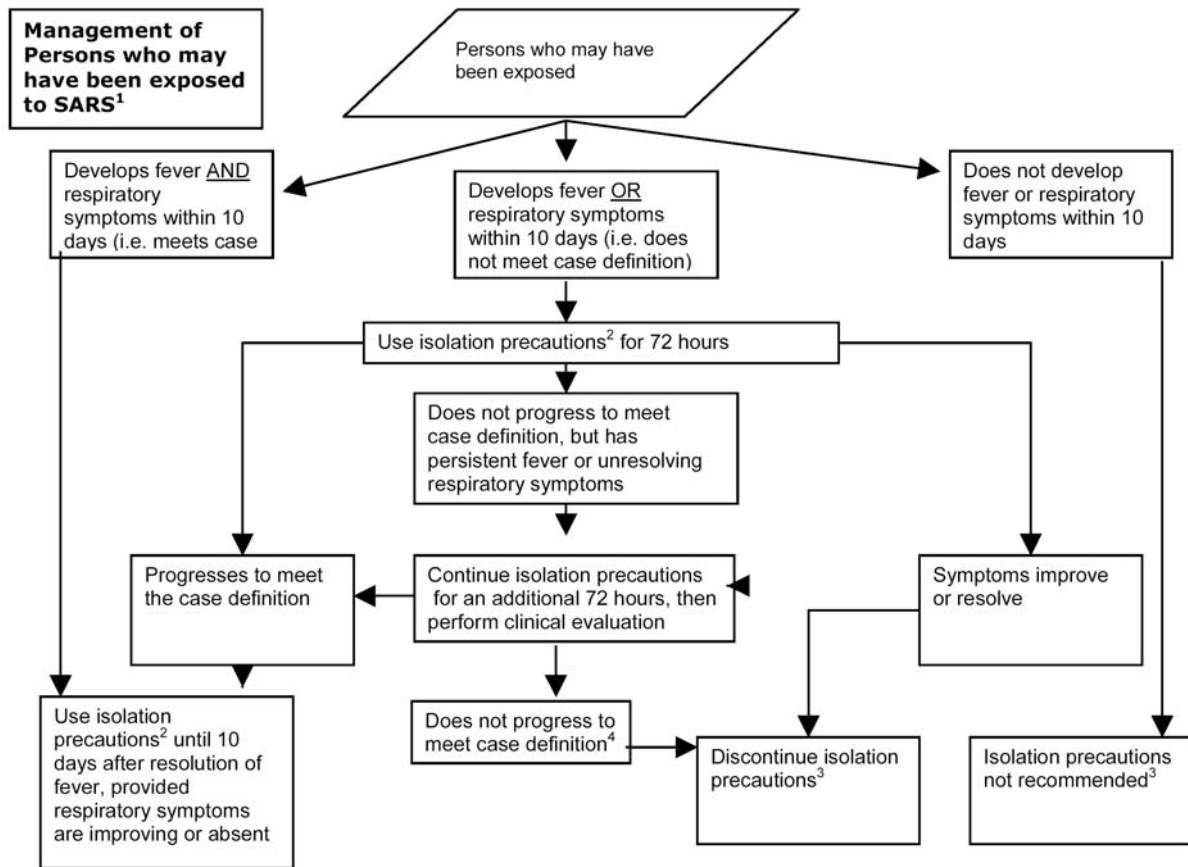
#### **Guidance for persons who may have been exposed to SARS patients** [May 7, 2003]

To date, most reported cases of SARS in the United States have been exposed through foreign travel to countries with community transmission of SARS (a listing of areas with community transmission can be found in the [case definition](#)), with only limited secondary spread to close contacts such as family members and health-care workers. Guidance for the management of exposures in health-care settings and infection control precautions for SARS patients and their close contacts in household settings can be found in the above sections entitled “[Management of exposures to SARS for healthcare settings](#)” and “[Households or residential settings](#).” The following guidance is intended to help clinicians manage persons other than health-care workers or household contacts who may have been exposed to SARS through international travel to an area with community transmission or as a result of a public health investigation. These recommendations are based on the experience in the United States to date and may be revised as more information becomes available.

1. Persons who may have been exposed to SARS should be vigilant for fever (i.e. measure temperature twice daily) and respiratory symptoms over the 10 days following exposure. During this time, in the absence of both fever and respiratory symptoms, persons who may have been exposed to SARS patients need not limit their activities outside the home and should not be excluded from work, school, out-of-home child care, church or other public areas.
2. Exposed persons should notify their health-care provider immediately if fever OR respiratory symptoms develop. **In advance of clinical evaluation, health-care providers should be informed that the individual may have been exposed to SARS so arrangements can be made, as necessary, to prevent transmission to others in the health-care setting.**
3. Symptomatic persons exposed to SARS should follow the following infection control precautions:
  - If fever OR respiratory symptoms develop, the person should limit interactions outside the home and not go to work, school, out-of-home child care, church, or other public areas. In addition, the person should use [infection control precautions in the home](#) to minimize the risk for transmission, and continue to measure temperature twice daily.
  - If symptoms improve or resolve within 72 hours after first symptom onset, the person may be allowed, after consultation with local public health authorities, to return to work, school, out-of-home child care, church or other public areas, and infection control precautions can be discontinued (see the figure below).
  - For persons who meet or progress to meet the case definition for suspected SARS (e.g., develop fever and respiratory symptoms), infection control precautions should be continued until 10 days after the resolution of fever, provided respiratory symptoms are absent or improving.
  - If the illness does not progress to meet the case definition, but the individual has persistent fever\* or unresolving respiratory symptoms, infection control precautions should be continued for an additional 72 hours, at the end of which time a clinical evaluation should be performed. If the illness progresses to meet the case definition, infection control precautions should be continued as described above. If case definition criteria are not met, infection control precautions can be discontinued after consultation with local public health authorities and the evaluating clinician (see figure). Factors that might be considered include the nature of the potential exposure to SARS, nature of contact with others in the residential or work setting, and evidence for an alternative diagnosis.
4. Persons who meet or progress to meet the case definition for suspected SARS (e.g., develop fever and respiratory symptoms) or whose illness does not meet the case definition, but who have persistent fever or unresolving respiratory symptoms over the 72 hours following onset of symptoms should be tested for SARS coronavirus infection. Collection of appropriate specimens for laboratory testing (see the above section entitled "[Diagnostic Testing/Specimen Collection for Potential Cases of SARS](#)") should be coordinated with and guided by local/state public health authorities and consultation with CDC.
5. If a person exposed to SARS is symptomatic while at work, school, out-of-home child care, church or other public setting, local public health authorities should be consulted regarding the need for education and follow-up of persons in attendance.



\*Clinical judgment should be used when evaluating patients for whom a measured temperature of  $>100.4^{\circ}\text{F}$  ( $>38^{\circ}\text{C}$ ) has not been documented. Factors that might be considered include patient self-report of fever, use of antipyretics, presence of immunocompromising conditions or therapies, lack of access to health care, or inability to obtain a measured temperature. Reporting authorities might consider these factors when determining whether infection control precautions should be continued.



1. Exposure includes travel from areas with documented or suspected community transmission of SARS (see the [case definition](#)) or close contact with persons who have SARS. Close contact is defined as having cared for or lived with a person known to have SARS or having a high likelihood of direct contact with respiratory secretions and/or body fluids of a patient known to have SARS. Examples of close contact include kissing or embracing, sharing eating or drinking utensils, close conversation (<3 feet), physical examination, and any other direct physical contact between persons. Close contact does not include activities such as walking by a person or sitting across a waiting room or office for a brief period of time.

2. Isolation precautions include limiting patient’s interactions with others outside the home (e.g. should not go to work, school, out of home day care, church or other public areas), and following infection control guidelines for the [home or residential setting](#) if not admitted to hospital for care.

3. Persons need not limit interactions outside of home (e.g., need not be excluded from work, school, out of home day care, church or other public areas).

4. Discontinuation of isolation precautions for patients who have not met the case definition 6 days following onset of symptoms, but who have persistent fever or respiratory symptoms should be done only after consultation with local public health authorities and the evaluating clinician. Factors that

might be considered include the nature of the potential exposure to SARS, nature of contact with others in the residential or work setting, and evidence for an alternative diagnosis.

### **Institutions or Organizations Hosting Persons Arriving from Areas with SARS** [May 14, 2003]

To date, most reported cases of SARS in the U.S. have been acquired during international travel to countries where SARS is being transmitted in the community. (These areas are described in the SARS case definition, which is found above in the section entitled "[Description and Case Definition](#)"). In this country, only a small number of suspected or probable cases of SARS have been detected among exposed health-care personnel and household contacts of SARS patients. Casual contact with SARS patients at schools, other institutions, or public gatherings (e.g., attending the same class or meeting) has not resulted in documented transmission in the U.S.

Thousands of people arrive in the U.S. from areas where SARS outbreaks are occurring to participate in gatherings such as academic courses, business meetings, or sporting events. Guidance is needed to provide a consistent, rational approach to SARS prevention without unnecessarily stigmatizing these groups or interfering with collegial pursuits, commerce, and other important activities.

**At this time, CDC does not recommend canceling or postponing classes, meetings or other gatherings that will include persons traveling to the U.S. from areas with SARS.** CDC is working closely with WHO and other partners as part of a global collaboration to address the SARS outbreak. The following comprehensive activities are taking place to prevent importation and spread of SARS from inbound passengers:

- Stringent outbreak control measures, including isolation of SARS patients and quarantine of their exposed contacts, in countries with SARS;
- Pre-embarkation screening of persons traveling from areas with SARS to defer travel for those with symptoms or signs of SARS or exposure to known SARS patients in the past 10 days;
- Assessment by health authorities of ill persons aboard arriving flights from an area with SARS to ensure that ill passengers are isolated and evaluated promptly upon arrival and that appropriate follow-up of other passengers occurs, as necessary;
- Distribution of health alert notices (see [http://www.cdc.gov/ncidod/sars/travel\\_alert.htm](http://www.cdc.gov/ncidod/sars/travel_alert.htm)) to travelers arriving in the U.S. from areas with SARS to notify them of the importance of monitoring their health closely for a period of 10 days following departure, and for persons who develop fever or respiratory symptoms, the need to promptly seek medical evaluation; and
- Rapid detection and isolation of persons in the U.S. who have traveled from an area with SARS and have symptoms compatible with early suspected SARS within 10 days of arrival.

**At this time, CDC does not recommend quarantine of persons arriving from areas with SARS.**

The following are interim recommendations to assist persons who are organizing gatherings of students and other persons traveling to the U.S. from areas with SARS, including gatherings in academic settings, business meetings, or sporting events, etc. These recommendations are based on the experience in the U.S. to date and may be revised as more information about the SARS situation in the U.S. and globally becomes available.

If organization representatives become aware of a person from an area with SARS who develops fever or respiratory symptoms, the following steps should be taken:

1. Exclude the ill person from activities (e.g., classes, meetings, and other public areas) and locate him/her in a separate area to minimize contact with other people while awaiting further medical evaluation.
2. Alert appropriate health-care personnel that an individual from an area with SARS requires evaluation, so that advance preparations can be made to implement infection control procedures to prevent transmission to others during transport and in the health-care setting.
3. Remind the treating health-care provider to notify the appropriate state or local health officials if SARS is suspected. Further information for health-care providers about the management of persons with suspected SARS is available in the section above entitled "[Guidance for persons who may have been exposed to SARS patients](#)."

Organizations that would like to take additional steps should consider the following actions:

1. Send basic information about SARS (see <http://www.cdc.gov/ncidod/sars/basics.htm>), including information in the health alert notice and a reminder about the importance of hand hygiene, to the participants before departure (by email, for example).
2. Notify the participants (prior to departure) that persons traveling from areas with SARS with fever or respiratory symptoms or exposure to SARS patients within 10 days prior to scheduled departure should not travel and should seek medical evaluation.
3. Contact state or local public health officials before the event, and collaborate to ensure that appropriate public health guidelines are followed.
4. Include basic information about SARS (see <http://www.cdc.gov/ncidod/sars/basics.htm>), including the information in the health alert notice and a reminder about the importance of hand hygiene, in the orientation or meeting registration packet.
5. Give participants tools for self-monitoring, which may include a complimentary thermometer, a temperature log, and contact information, as well as alcohol-based hand rubs for hand hygiene.
6. Work with state or local public health officials to identify an emergency room or other health-care facility where an ill visitor may be evaluated and where recommended [infection control](#) measures (see the above section entitled "[Management of exposures to SARS for healthcare settings](#)") can be followed, and/or arrange for health-care providers to be available on site.
7. Establish a health information hotline or website.
8. Screen participants to identify those at high risk for SARS; sample questions that may be useful include:
  - In the past 10 days, have you been in an area with SARS (see <http://www.cdc.gov/ncidod/sars/travel.htm>)?
  - If so, do you have any of the following symptoms: fever, cough, difficulty breathing, or shortness of breath?
  - In the past 10 days, have you had close contact with any person who has been diagnosed with SARS? (Close contact is defined as caring for or living with someone with SARS, or having direct contact with infectious material such as respiratory secretions from a person who has SARS.)

9. Work with local and state public health officials to determine where patients with SARS (who do not medically require hospitalization) will be housed until their symptoms resolve. (Persons should be hospitalized unless they can be housed in a designated residential facility for isolation of convalescing cases where recommended infection control measures [see the above section entitled "[Management of exposures to SARS for healthcare settings](#)"] can be followed.)

**Businesses/other organizations with employees returning from areas with SARS** [May 14, 2003]

To date, most reported cases of SARS in the U.S. have been acquired during international travel to countries where SARS is being transmitted in the community. (These areas are described in the SARS case definition, which is found above in the section entitled "[Description and Case Definition](#)"). The following are interim recommendations to assist businesses and other organizations that have employees returning from areas with SARS after travel for business or personal reasons. More information for persons traveling to areas with SARS can be found at <http://www.cdc.gov/ncidod/sars/travel.htm>.

**At this time, CDC is not recommending quarantine of persons returning from areas with SARS.**

While in areas with SARS, persons who have fever or respiratory symptoms should not travel and should seek medical attention. Travelers who arrive in the U.S. from areas with SARS are receiving yellow health alert notices (see [http://www.cdc.gov/ncidod/sars/travel\\_alert.htm](http://www.cdc.gov/ncidod/sars/travel_alert.htm)) upon arrival, notifying them of the importance of monitoring their health closely for a period of 10 days and of seeking medical evaluation promptly if fever, cough, or difficulty breathing develop.

Persons returning from areas with SARS should be vigilant for fever (i.e., measure temperature twice a day) and respiratory symptoms (cough, shortness of breath, or difficulty in breathing) over the 10 days after departure. These persons need not limit their activities and should not be excluded from work, meetings, or other public areas, unless fever or respiratory symptoms develop.

Persons returning from areas with SARS should notify their healthcare provider immediately if fever OR respiratory symptoms develop within 10 days after departure. The healthcare provider should be contacted in advance so arrangements can be made, if necessary, for infection control measures to prevent transmission to others in the healthcare setting (see the above section entitled "[Triage and disposition](#)"). Such persons should not go to work or other public areas until advised to do so by their healthcare provider.

These guidelines are interim recommendations based on the experience in the U.S. to date and may be revised as more information about the SARS situation in the U.S. and globally becomes available.

Additional information for healthcare providers on the management of persons who may have been exposed to SARS can be found in the section above entitled "[Guidance for persons who may have been exposed to SARS patients](#)."

Guidance for persons with SARS and their household contacts can be found in the above section entitled "[Households or residential settings](#)."

More information for persons traveling to areas with SARS can be found at <http://www.cdc.gov/ncidod/sars/travel.htm>.

**Persons with laboratory evidence of SARS-CoV who have no/mild symptoms** [May 30, 2003]

Studies are ongoing at laboratories throughout the world to better understand the natural history of SARS-CoV infection, including viral shedding and potential transmission of infection. Currently, CDC does not have epidemiologic evidence for high risk of transmission of this infection from persons who are without fever or respiratory symptoms. As investigations continue to gather scientific data, the following is intended to provide interim guidance for handling infection control issues associated with persons with asymptomatic or mild illness who have culture or RT-PCR evidence of ongoing SARS-CoV infection. Based on current information, three categories of persons with mild or asymptomatic infection who have laboratory evidence (culture, RT-PCR or ELISA) of SARS-CoV in clinical specimens can be identified. These categories and the associated infection control guidance are as follows:

### **Category I**

***Clinical History:***

Persons who had previously been identified as a suspect or probable SARS patient who have now resolved symptomatic illness from this infection.

***Infection Control:***

Guidance should be followed as described in the above section entitled "[Households or residential settings](#)."

### **Category II**

***Clinical History:***

Persons not reporting fever or respiratory symptoms, who either did or did not have close contact with a known SARS (suspect or probable) patient during the 10 days preceding specimen collection.

***Infection Control:***

Asymptomatic individuals in Category II who are identified as SARS coronavirus-positive should limit interactions outside the home and not go to work, school, out-of-home childcare, church, or other public areas; in addition, such persons should use infection control precautions in the home to minimize the risk for transmission (see the above section entitled "[Households or residential settings](#)"). This limited interaction should continue for 72 hours after collection of the clinical specimen(s) that tested positive for SARS coronavirus. If no fever or respiratory symptoms develop during this time, infection control measures can be discontinued. If the test result is reported more than 72 hours after specimen collection, and the individual remained asymptomatic during that 72-hour period, no infection control measures need be instituted. If fever or respiratory symptoms develop within 72 hours after specimen collection, the person should be re-evaluated as a suspect or probable SARS patient.

### **Category III**

***Clinical History:***

Persons reporting mild illness with either fever or respiratory symptoms, but who do not meet the clinical [case definition](#) for suspect or probable SARS, and who either did or did not have close contact with a known SARS (suspect or probable) patient during the 10 days preceding specimen collection.

***Infection Control:***

Persons with mild illness in Category III who are identified as SARS coronavirus-positive should limit interactions outside the home and not go to work, school, out-of-home childcare, church, or other public areas; in addition, such persons should use infection control precautions in the home to minimize the risk for transmission (see the

above section entitled “[Households or residential settings](#)”). This limited interaction should continue for 72 hours after collection of the clinical specimen(s) that tested positive for SARS coronavirus. If symptoms resolve during this time, then discontinuation of isolation precautions can be considered only after consultation with local public health authorities and the evaluating clinician. If the person has persistent fever or unresolving respiratory symptoms for the 72 hours after specimen collection, the person should be re-evaluated and isolation precautions should continue for an additional 72 hours. If symptoms do not progress, then discontinuation of isolation precautions can be considered only after consultation with local public health authorities and the evaluating clinician. Factors that might be considered to determine discontinuation of isolation precautions include the nature of the potential exposure to SARS, nature of contact with others in the residential or work setting, coronavirus test results, and evidence for an alternative diagnosis.

### **Advice for Travelers about SARS** [July 7, 2003]

CDC has issued a number of travel alerts and travel advisories related to the outbreak of SARS cases.

**Travel Alert:** notification by CDC that an outbreak of a disease is occurring in a geographic area. The purpose of an alert is to provide accurate information to travelers and resident expatriates about the status of the outbreak, how they can reduce their risk for infection, and what to do if they should become ill while in the area. The risk for the individual traveler is felt to be definable and limited; transmission has occurred in defined settings or is associated with specific risk factors (e.g., transmission in a health-care or hospital setting where ill patients are being cared for). CDC does not recommend *against nonessential travel to the area*.

**Travel Advisory:** notification by CDC that an outbreak of a disease is occurring in a geographic area. The purpose of an advisory is to provide accurate information to travelers and resident expatriates about the status of the outbreak and how they can reduce their risk for infection. It also serves to reduce the volume of traffic to the affected areas which in turn can reduce the risk of spreading the disease to previously unaffected sites. *CDC recommends against nonessential travel to the area* because the risk for the traveler is considered to be much higher (e.g., the risk is increased because of evidence of community transmission and/or inadequate containment).

The latest SARS travel alerts and advisories are available at <http://www.cdc.gov/ncidod/sars/travel.htm>. CDC has developed a series of questions and answers on issues related to travel and quarantine; these are available at <http://www.cdc.gov/ncidod/sars/qa/travel.htm>. Additional information on travel alerts and advisories is available at [http://www.cdc.gov/ncidod/sars/travel\\_alertadvisory.htm](http://www.cdc.gov/ncidod/sars/travel_alertadvisory.htm).

If an individual decides to go ahead with travel to an area with SARS, the following guidelines should be kept in mind.

#### **Before you leave:**

- Assemble a travel health kit containing basic first aid and medical supplies. Be sure to include a thermometer, household disinfectant, a supply of surgical masks and disposable gloves (for use if you or someone you are traveling with becomes ill with SARS), and alcohol-based hand rubs for hand hygiene.
- Inform yourself and others who may be traveling with you about SARS. For information about this illness, see CDC's SARS Web site at <http://www.cdc.gov/ncidod/sars/index.htm>.



- Be sure you are up to date with all your shots, and see your health-care provider at least 4 to 6 weeks before travel to get any additional shots or information you may need. For information on CDC health recommendations for international travel, see CDC's Travelers' Health site at <http://www.cdc.gov/travel/>.
- You may wish to check your health insurance plan or get additional insurance that covers medical evacuation in the event of illness. Information about medical evacuation services can be found at a U.S. Department of State web page (<http://www.travel.state.gov/medical.html>).
- Identify in-country health-care resources in advance of your trip.

**While you are in an area with SARS:**

- To protect against SARS infection, wash your hands frequently.
- To minimize the possibility of infection, observe precautions to safeguard your health. This includes avoidance of settings where SARS is most likely to be transmitted, such as health-care facilities caring for SARS patients. CDC does not recommend the routine use of masks or other personal protective equipment while in public areas.

**If you think you have SARS or symptoms compatible with SARS:**

- If you become ill with fever or respiratory symptoms (for example, cough or shortness of breath), a visit to a health-care provider is strongly recommended. **Tell the provider about your symptoms prior to going to the office or emergency room so arrangements can be made, if necessary, to prevent transmission to others in the health-care setting.** The nearest U.S. Embassy or Consular Office can help you find a provider in the area. Again, you are encouraged to identify these resources in advance. Do not travel while sick and limit your contact with others as much as possible to help prevent the spread of any infectious illness you may have.
- The person who is ill should cover their mouth and nose with a facial tissue when coughing or sneezing. If possible, a surgical mask should be worn during close contact with healthy people to prevent spread of infectious droplets. If the sick person is unable to wear a surgical mask, other persons should wear surgical masks when in close contact with the person who is ill.
- Use of disposable gloves should be considered for any direct contact with body fluids of a person with SARS. **However, gloves are not intended to replace proper hand hygiene.** Immediately after activities involving contact with body fluids, gloves should be removed and discarded and hands should be cleaned. Gloves must never be washed or reused.
- All close contacts staying with a person with SARS should carefully follow recommendations for hand hygiene (e.g., frequent hand washing or use of alcohol-based hand rubs), particularly after contact with body substances (e.g., respiratory secretions, urine, or feces).
- People with SARS should avoid sharing eating utensils, towels, and bedding with others, although these items can be used by others after routine cleaning, such as washing or laundering with soap and hot water.
- Environmental surfaces (e.g., toilets, sinks) soiled by body fluids should be cleaned with a household disinfectant according to manufacturer's instructions; gloves should be worn during this activity. Wash hands afterwards and throw the gloves away.
- Other close contacts staying with a person with SARS do not need to restrict their outside activities unless they develop symptoms of SARS, such as a fever or respiratory illness.

**After your return:**

- Persons returning from one of the affected areas should monitor their health for 10 days. Any family member who becomes ill with fever or respiratory symptoms during this period should consult a healthcare provider and tell him or her about their recent travel. **Tell the provider about your symptoms prior to going to the office or emergency room so arrangements can be made, if necessary, to prevent transmission to others in the health-care setting.**
- Close contacts of person with SARS who develop fever or respiratory symptoms should be evaluated by a health-care provider. **Before** the evaluation, health-care providers should be informed that the individual is a close contact of a person with SARS. These persons with symptoms of SARS should follow the same precautions recommended for people with SARS.

For additional information about travel advisories, check [www.cdc.gov/travel](http://www.cdc.gov/travel), which will be updated as necessary.

**More Information**

Anyone having questions about SARS can contact DHSS at **1-800-392-0272**.

CDC's SARS web site (contains the most recent information and recommendations for medical professionals and the public): <http://www.cdc.gov/ncidod/sars/>.

WHO's SARS web site: <http://www.who.int/csr/sars/en/>.

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DHSS DISTRIBUTION LIST: DHSS web page and providers managing suspect cases.