Surveillance Protocol for SARS - Draft

Note: This draft is dated ***June 06, 2003.*** Information about SARS is changing rapidly. Make certain you have the most current guidance. For your convenience all major new changes are in ***bold italics.***

Public Health Action

1. Educate providers about screening, isolation and urgent reporting of suspect patients with SARS.

2. Educate the public about appropriate isolation and management of SARS patients and SARS contacts.

3. Identify public health personnel who may respond to a SARS emergency and assure that they are fit-tested with an N-95 mask, and supplied with eye protection, gloves and gowns. Assure they have a supply of alcohol-based hand cleanser, if needed, for field work.

4. If a suspect case of SARS is reported:
    a. Use the CDC SARS screening form to determine if the reported case meets the case definition.
    b. If yes, complete the CDC SARS case report form. Attach the chest X-ray report. Fax immediately to 304-558-6335.
    c. Laboratory confirmation is important for epidemiological purposes, though the science of laboratory testing is too new to impact either treatment or isolation decisions at this time. Ask providers to collect and hold any of the following specimens, as appropriate:
        i. Frozen and formalin fixed tissues from an autopsy
        ii. Transbronchial or pleural biopsy specimens fixed in formalin
        iii. Bronchioaveolar lavage (BAL) specimens spun with supernatant frozen and cell pellet fixed in formalin
        iv. Acute and convalescent serum samples, either at room temperature, iced, or frozen
        v. Peripheral blood smear, dried, at room temperature
        vi. Nasopharyngeal wash or throat swab in viral transport medium, frozen
        vii. Stool specimens
        viii. Urine specimens
    d. Consult IDEP. In consultation with CDC, IDEP will determine if testing for SARS should be performed.

5. Assure cases and suspect cases are appropriately isolated, as follows:
    a. In hospital, use:

i. Standard precautions. In addition to standard precautions, healthcare workers should use eye protection.
ii. Airborne precautions, including use of an N-95 mask for health care workers and a negative pressure room for the patient;
iii. Contact precautions, including use of gowns and gloves.

b. In out-patient facilities:
i. If feasible, take the same precautions as for hospitals. If not feasible, keep suspect SARS patients separated from patients and staff. At a minimum, use droplet and contact precautions.
ii. Assure that patients are screened for SARS symptoms and risk factors in a separate area, and that a surgical mask is placed on suspect patients.
iii. Health care workers should use an N-95 mask, if available for care of suspect SARS patients. If an N-95 mask is not available, a surgical mask should be used.

c. In the home:
i. The local health department should educate the patient about appropriate home isolation, respiratory protection for caregivers, and appropriate hand hygiene, including:
(1) SARS patients should stay in the home until 10 days after the resolution of symptoms.
(2) All members of a household with a SARS patient should practice frequent hand washing or use of alcohol-based hand rubs), particularly after contact with body fluids (e.g., respiratory secretions, urine, or feces).
(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) 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. If a mask is not available at least cover the mouth with tissue when coughing or sneezing.
(5) Do not share eating utensils, towels, clothing and bedding between SARS patients and others. 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 monitored daily 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. Household members or other close contacts with symptoms of SARS should follow the same precautions recommended for SARS patients. 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.

(9) Additional common-sense steps to minimize the risk from household exposure may include: use of a private room by the SARS patient, and use of separate bathroom facilities. Families should also consider exclusion of young children or older or chronically ill individuals from the household if possible.

6. For SARS patients in home isolation, contact the patient daily to follow up on their status. Record follow up information on the CDC SARS case report form in the notes section. Maintain daily follow-up until resolution of symptoms, and periodic follow-up until 10 days after resolution of symptoms when the patient should be released from isolation.

7. If the case meets the suspect case definition, identify exposed contacts. Exposed contacts are defined as those who have cared for, lived with or had face-to-face (within 3 feet) contact with or direct contact with respiratory secretions and/or body fluids of a person with SARS since onset of symptoms. Educate and manage contacts as follows:
   a. List all contacts on the contact line listing.
   b. Educate all contacts about symptoms of SARS, and advise them to notify the local health department immediately if symptoms develop. Educate exposed individuals to *stay at home* and not go to school or work *if they become symptomatic*. Advise them to notify the health care provider of their exposure to SARS when (or ideally before) they seek medical attention.
   c. Call or visit contacts daily and inquire if they have developed symptoms. Record followup information on the followup form. If the contact becomes symptomatic, physician evaluation is needed. The physician should be

notified that the patient is a SARS contact. If the contact now meets the case definition of SARS, manage as in numbers 4,5,and 6 above.

d. Manage specific situations as follows:

i. Health care setting: During the 10-day period following exposure of a health care worker, the health care worker should be monitored daily by the employee health nurse in the hospital for development of fever or respiratory symptoms, and should be placed on leave immediately if symptoms develop. Asymptomatic exposed health care workers can perform their usual duties without restriction.

(1) ***Health care workers who develop symptoms but their symptoms improve or resolve within 3 days after first symptom onset, may be allowed to return to work.***

(2) ***Health care workers who meet or progress to meet the case definition for suspected SARS (e.g., develop fever and respiratory symptoms), should be continued on infection control precautions until 10 days after resolution of symptoms***.

(3) ***Health care workers whose illness does not progress to meet the case definition, but the individual has persistent fever or unresolving respiratory symptoms after 3 days should be continued on infection control precautions for an additional 3 days, 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. If case definition criteria are not met, infection control precautions can be discontinued after consultation with IDEP and the evaluating clinician.***

ii. School or workplace: During the 10-day period following exposure of a student or worker, the exposed individual may attend as usual if asymptomatic.

(1) ***Household member or other close contacts who develop symptoms but their symptoms improve or resolve within 3 days after first symptom onset, may be allowed to return to school or work.***

(2) ***Household members or close contacts who meet or progress to meet the case definition for suspected SARS (e.g., develop fever and respiratory symptoms), should be continued on infection control precautions until 10 days after resolution of symptoms***.

(3) ***Household member or other close contacts whose illness does not progress to meet the case definition, but the individual has persistent fever or unresolving respiratory symptoms after 3 days should be continued***

on infection control precautions for an additional 3 days, 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. If case definition criteria are not met, infection control precautions can be discontinued after consultation with IDEP and the evaluating clinician.

Disease Control Objective

To prevent secondary cases of SARS in the state of West Virginia by prompt identification and appropriate isolation of suspect SARS cases in our state.

Disease Prevention Objectives

To prevent nosocomial and community-acquired SARS in the state of West Virginia.

Disease Surveillance Objectives

1. To detect SARS if it occurs in West Virginia.
2. To characterize the occurrence of disease in person, place and time.
3. To characterize the risk factors for disease in our state.
4. To characterize the risk factors for adverse outcome from SARS in our state.
5. To estimate attack rates and secondary attack rates in our population.
6. To identify patterns and mode of spread.

Public Health Significance

First identified as an outbreak of respiratory disease in Hong Kong in February, 2003, SARS has spread to ***28 nations and 5 continents as of June 05, 2003.*** A total of ***8,403 cases*** of respiratory illness and ***775 deaths*** world-wide have been attributed to the disease. A novel coronavirus has been identified as the etiologic agent in four independent laboratories. Preliminary studies suggest this virus has never before infected US populations. WHO has called attention to the possibility of a world-wide pandemic due to this agent.

In the early stages of the outbreak, health care workers have been disproportionately affected in hard-hit areas, resulting in disruptions in medical services. The public health community should focus now on educating health care workers to establish systems to protect themselves.

Besides testing our response to emerging infectious diseases, this disease also serves as an excellent model for bioterrorism and pandemic influenza response.

Clinical Description

Patients present with fever chills or rigors, myalgias, malaise, headache and dizziness.

Cough is universally present and usually dry. Sore throat, coryza, nausea, vomiting and diarrhea may be present in some patients.

On examination, the patient is typically febrile and may have rales or signs of pulmonary consolidation.

Laboratory studies typically demonstrate lymphopenia. Thrombocytopenia occurs in about half of cases. A sizeable minority of patients may have elevated serum alanine aminotransferases, creatinine kinase and lactic dehydrogenase. Hyponatremia and hypokalemia may also occur.

Chest X-ray shows signs of peripheral consolidation in some patients. Subsequent progression to acute respiratory distress syndrome (ARDS) may occur in a minority of patients with severe disease.

Patients with a more severe clinical course have generally been older and had underlying disease. Severe respiratory failure due to ARDS has been the major cause of death. ***Case fatality rate in hospitalized patients was estimated at 6.5% in a series of patients from Toronto, Canada.***

Etiologic agent

A novel coronavirus (SARS-CoV), proposed to be named “Urbani SARS-associated coronavirus.”

Reservoir

Unknown

Mode of Transmission

While information is still incomplete, droplet transmission and direct or indirect contact explain most disease that has been recognized to date.

The virus has been isolated from feces, respiratory secretions, and urine. The virus can survive in feces for at least 2 days and in urine for at least 24 hours. Studies at one laboratory demonstrated that virus in feces taken from patients suffering from diarrhea, which has a lower acidity than normal stools could survive for as long as 4 days. Studies have also demonstrated that the SARS virus can survive after drying on plastic surfaces for up to 48 hours. WHO has established that commonly used hospital disinfectants are effective against the virus.

Incubation period

2-10 days (CDC)

Infectious Period

Unknown. Likely from onset of symptoms until some time after illness has begun. Until established, assume that the infectious period is from onset of symptoms until 10 days after resolution of symptoms.

Outbreak recognition

As West Virginia has never had a case of SARS, one case is defined as an outbreak.

Case Definition
(June 05, 2003)

Clinical Criteria

- ***Asymptomatic or mild respiratory illness***

- ***Moderate respiratory illness***
  - Temperature of >100.4º F (>38º 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 >100.4º F (>38º C)*
  - 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 recently documented or suspected community transmission of SARS (see Table), or***

- ***Close contact§ within 10 days of onset of symptoms with a person known or suspected to have SARS***

Travel criteria for suspect or probable U.S. cases of SARS

Area	*First date of illness onset for inclusion as reported case‡‡*	*Last date of illness onset for inclusion as reported case††*
China (mainland)	*November 1, 2002*	*Ongoing*
Hong Kong	*February 1, 2003*	*Ongoing*
Hanoi, Vietnam	*February 1, 2003*	*May 25, 2003*
Singapore	*February 1, 2003*	*June 14, 2003*
Toronto, Canada	*April 23, 2003*	*Ongoing*
Taiwan	*May 1, 2003*	*Ongoing*

Laboratory Criteria ¶

- ***Confirmed***
  - Detection of antibody to SARS-CoV in specimens obtained during acute illness or >21 days after illness onset, 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 convalescent serum obtained > 21 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, negative, or undetermined***

- ***Suspect case: meets the clinical criteria for moderate respiratory illness of unknown etiology and epidemiologic criteria for exposure; laboratory criteria confirmed, negative, 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 was reported on the basis of contact with an index case that was subsequently excluded as a case of SARS (e.g., another etiology fully explains the illness) provided other possible epidemiologic exposure criteria are not present***

*** A measured documented temperature of >100.4º F (>38º C) is preferred. However, clinical judgment should be used when evaluating patients for whom a measured temperature of >100.4º F (>38º 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 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 dates for Toronto and Taiwan are 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 http://www.cdc.gov/ncidod/sars/specimen_collection_sars2.htm). Absence of SARS-CoV antibody from serum obtained < 21 days after illness onset, a negative PCR test, or a negative viral culture does not exclude coronavirus infection and is not considered a definitive laboratory result. In these instances, a convalescent serum specimen obtained > 21 days after illness is needed to determine infection with SARS-CoV. All SARS diagnostic assays are under evaluation.

***** 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.***

Laboratory Diagnosis:
Laboratory diagnosis is not readily available and results will not impact either clinical or public health decision-making; however, laboratory testing is *extremely important to pursue for epidemiological purposes*. Clinicians and public health practitioners should collaborate to collect and store any of the following specimens on persons who meet the case definition:

UPPER RESPIRATORY TRACT

- Nasopharyngeal wash/aspirate: Collect 1-2 ml into sterile vial.
- Nasopharyngeal/oropharyngeal swabs: Collect one NP and one OP swabs; use Dacron swabs with a non-wooden shaft.

  Place one NP swab and one OP swab into the same sterile vial containing 2 ml of viral transport media.

LOWER RESPIRATORY TRACT

Broncheoalveolar lavage (BAL), tracheal aspirate, or pleural tap: Half of specimen centrifuged with cell pellet fixed in formalin. Remaining *unspun* specimen collected into sterile vials. If the patient is intubated and it is clinically indicated, consider a transbronchial, fine needle or open lung biopsy. Store and ship on wet ice.

BLOOD COMPONENTS

- White Blood Cells: If available collect 8 ml whole blood in a CPT tube (Becton Dickinson), centrifuge 1500 RCF. Ship on wet ice.
- Serum: Collect 5-10 ml of whole blood in serum separator tube. Allow blood to clot, centrifuge and aliquot resulting sera. If serum has already been frozen, ship on dry ice. If unfrozen, ship on wet ice.
- Whole blood: Collect 5-10 ml of whole blood in an EDTA (purple-top) tube. Ship on wet ice.

TISSUE

- Fixed tissue: Formalin fixed or paraffin embedded tissue from all major organs (e.g. lung, trachea, heart, spleen, liver, brain, kidney, adrenals). Store and ship at room temperature. ***DO NOT FREEZE FIXED TISSUES***
- Frozen tissue: Fresh frozen tissues from lung and upper airway (e.g. trachea, bronchus). Specimens should be collected aseptically via biopsy or at autopsy performed as soon as possible after death. Place each specimen in separate sterile containers containing small amounts of viral transport media or saline. Store and ship on dry ice.

URINE

Optimal acute specimen is cell pellet from approximately 50 cc of first void morning urine specimen, re-suspended in 2-3 cc. viral transport medium, tissue culture medium or phosphate buffered saline. Ship on wet ice.

STOOL

Stool (10-50 cc) should be placed in a stool cup or urine container, securely capped, sealed with parafilm and bagged. Ship on wet ice.

Contact IDEP (304-558-5358 or 1-800-423-1271 for consultation prior to shipping to CDC.

Surveillance Indicators

1. Proportion of cases with complete demographic information
2. Proportion of suspect cases with laboratory testing performed.
3. Proportion of cases with complete clinical and risk factor information
4. Proportion of cases with identified contacts.
5. Number of contacts per case.
6. Proportion of contacts with complete follow-up information.
7. Proportion of cases with complete follow-up information.
8. Proportion of secondary cases linked to:
    a. Transmission in health care
    b. Transmission in households;
    c. Transmission in the community.