



SEVERE ACUTE RESPIRATORY SYNDROME (SARS)

1. **Agent:** A human coronavirus (SARS-CoV) first identified in February 2003 causes SARS. Other factors may be contributory (co-infection, genetics, environmental factors).
2. **Identification:**
 - a. **Symptoms:** Illness generally begins with a prodrome of fever ($\geq 100.4^{\circ}\text{F}$ [$\geq 38.0^{\circ}\text{C}$]). Fever is often associated with chills and rigors, and sometimes accompanied by headache, malaise, and myalgia. At the onset of illness, some persons have mild respiratory symptoms. Diarrhea during the febrile prodrome may be present. After 2-7 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. To date, almost all cases with laboratory evidence of SARS-CoV disease developed radiographic evidence of pneumonia by day 7-10 of illness—most (about 70-90%) developed lymphopenia.

NOTE: Pediatric and elderly populations may manifest symptoms differently.
 - b. **Differential Diagnosis:** Other agents that cause febrile respiratory illnesses including, but not limited to, influenza viruses, respiratory syncytial virus, parainfluenza viruses, *Streptococcus pneumoniae*, *Legionella* species, mycoplasma, and other atypical pneumonia agents.
 - c. **Diagnosis:** A case is defined by meeting criteria in CDC's Interim U.S. Case Definition for SARS at www.cdc.gov/ncidod/sars/casedefinition.htm. Cases are further subdivided into: 1) **Report Under Investigation (RUI)**, 2) **probable** cases based upon pulmonary findings, and 3) **confirmed** based on laboratory findings.
3. **Incubation:** Typically 2-7 days, up to 10-14 days.
4. **Reservoir:** Unknown.
5. **Source:** Respiratory secretions, blood or tissue, possibly other bodily fluids, and fomites contaminated with any of these fluids.
6. **Transmission:** The main route of transmission is direct contact, via the eyes, nose, and mouth, with infectious respiratory droplets. Contamination of inanimate materials or objects by infectious respiratory secretions or other body fluids may play a role in disease transmission. Airborne and fecal-oral transmissions have not been ruled out, but seem less likely the more SARS is understood. Infectious droplets do not ordinarily travel in the air beyond three feet; therefore it appears at this time that close contact with an infected person is necessary for transmission to occur.
7. **Communicability:** Information to date suggests that cases are most likely to be infectious when they have symptoms. Cases are most infectious during the second week of illness. It is unknown how long before or after onset of symptoms cases might be able to transmit the disease.
8. **Specific Treatment:** Supportive care, e.g., rest, antipyretics, fluids, etc. 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.
9. **Immunity:** Uncertain.

REPORTING PROCEDURES

1. **Report suspected cases by telephone immediately.**
2. **Report Form (for internal ACDC use):**
 - a. SARS Screening Form.
 - b. SARS Case Report Intake Form.
 - c. SARS Voluntary 72-hour Infection Control Agreement (for RUIs).
 - d. SARS Voluntary Infection Control Agreement (10 days, for probable cases).



- e. Daily Monitoring for Compliance.
- f. Assessment Checklist for Home Isolation.
- g. Order of Isolation in a Hospital or Institution.
- h. Order of Isolation in a Private Residence

3. Epidemiologic Data:

- a. Travel, including transit in an airport, (or close contact with an ill person with a history of travel), within 10 days of onset of symptoms to an area with current or recently documented or suspected community transmission of SARS (Mainland China, Hong Kong, or Taiwan in particular); check with current CDC guidelines at:

www.cdc.gov/ncidod/sars/casedefinition.htm

- b. Employment as a healthcare worker who has direct patient contact.
- c. Employment as a worker in laboratory that contains live SARS-CoV.
- d. Close contact (defined as having cared for or lived with a person known to have SARS or having likelihood of direct contact with respiratory secretions and/or bodily fluids of a patient known to have SARS) within 10 days of onset of symptoms with a person known or suspected to have SARS infection.
- e. Part of a cluster of cases of atypical pneumonia without an alternative diagnosis.
- f. Date of illness onset.

CONTROL OF CASE & CONTACTS

If the clinician and health department have a high index of suspicion for SARS disease, the patient should be placed immediately on SARS isolation precautions and contacts should be immediately identified, evaluated, and monitored for evidence of respiratory disease.

For further guidance, discuss with ACDC and visit: www.cdc.gov/ncidod/sars/ic.htm.

DIAGNOSTIC PROCEDURES:

Initial diagnostic evaluation to look for an alternative diagnosis in suspected SARS-CoV patients should be performed as clinically indicated, and may include:

- Chest radiograph
- Pulse oximetry
- Complete blood count with differential
- Blood cultures
- Sputum Gram stain and culture
- Testing for viral respiratory pathogens, notably influenza A and B and respiratory syncytial virus
- Specimens for Legionella and pneumococcal urinary antigen testing

Laboratory confirmation of SARS-CoV infection is based on:

1. Detection of any of the following by a validated test, with confirmation in a reference laboratory, such as:
 - a. Serum antibodies to SARS-CoV in a single serum specimen, **OR**
 - b. A four-fold or greater increase in SARS-CoV antibody titer between acute- and convalescent-phase serum specimens tested in parallel, **OR**
 - c. Negative SARS-CoV antibody test result on acute-phase serum and positive SARS-CoV antibody test result on convalescent-phase serum tested in parallel; **OR**
2. Isolation in cell culture of SARS-CoV from a clinical specimen, with confirmation using a test validated by CDC; **OR**
3. Detection of SARS-CoV RNA by RT-PCR validated by CDC, with confirmation in a reference laboratory, from:
 - a. Two clinical specimens from different sources; **OR**
 - b. Two clinical specimens collected from the same source on two different days.

It is important to collect several different types of specimens as well as multiple specimens during the course of the illness.



NOTE: Guidelines for the collection and transport of specimens for SARS-CoV testing are provided in Appendix F4, Supplement F, in Public Health Guidance for Community-Level Preparedness and Response to Severe Acute Respiratory Syndrome (SARS) available at: www.cdc.gov/ncidod/sars/guidance/F/app4.htm.

PREVENTION-EDUCATION

1. Reinforce basic infection control practices in healthcare facilities and among healthcare personnel.
2. Educate staff about the importance of strict adherence to and proper use of standard infection control measures, especially hand hygiene (i.e., hand washing or use of an alcohol-based hand rub). For complete recommendations on hand hygiene, refer to: www.cdc.gov/handhygiene.
3. Reinforce education on the recommended procedures for Standard Contact and Airborne Infection Isolation (All) Precautions (see www.cdc.gov/ncidod/dhqp/gl_isolation.html).
4. Ensure that personnel have access to appropriate PPE, are instructed in the proper use of PPE, and have had respirator fit testing.
5. Ensure early recognition and prevention of transmission of SARS-CoV and other respiratory viruses at the initial encounter with a healthcare setting see:

www.cdc.gov/ncidod/sars/clinicalguidance.htm