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SEVERE ACUTE RESPIRATORY SYNDROME (SARS)

What Is It?

Severe Acute Respiratory Syndrome (SARS) is a respiratory infection that is caused by a virus, the SARS-associated coronavirus (SARS-CoV). First reported in Asia in 2003, the virus quickly spread globally, infecting 8,098 people and resulting in death in 774 in that outbreak.

How can you get it?

The virus is thought to spread by respiratory droplets (droplet spread) produced when an infected person coughs or sneezes. This requires close person-to-person contact since these droplets are only propelled a short distance (generally up to 3 feet) through the air. Infection occurs when droplets are deposited on the mucous membranes of the mouth, nose, or eyes of persons who are nearby. Patients with SARS are infectious when they have symptoms including fever and cough.

The virus also can spread when a person touches a surface contaminated with infectious droplets and then touches his or her mouth, nose, or eye(s).

Since this is a relatively new virus, it is possible that spread through the air (airborne spread) occurs.

What are the symptoms?

Symptoms begin about 2-7 days after exposure to the virus and may include:

- Fever
- Body aches
- Headache
- Diarrhea in 10 to 20 % of patients
- Mild respiratory symptoms at the beginning of the illness that may progress to dry coughing after 2 to 7 days

The severity of illness is highly variable, from mild illness to death.

Complications: pneumonia is common; death occurred in almost 10% of patients in the 2003 epidemic.

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How do you prevent it?

Minimizing exposure is essential for SARS since no vaccine is available.

According to Supplement I: Infection Control in Healthcare, Home, and Community Settings of the CDC's Public Health Guidance for Community-Level Preparedness and Response to Severe Acute Respiratory Syndrome (SARS) Version 2

(<http://www.cdc.gov/sars/guidance/i-infection/prehospital.html>)

Employers should have a surveillance system in place to ensure that workers who may have had exposure to SARS-CoV are identified and monitored and that those who develop illness receive appropriate care. This system may include the following activities:

- Establish a process to identify exposed personnel. Possible mechanisms include self-reports, sign-in sheets, or logs.
- Instruct personnel who have unprotected contact with patients with SARS-CoV disease or who have early symptoms of SARS-CoV disease to immediately notify occupational health, infection control, or a designee.
- Develop a system to identify healthcare personnel who provided care to a patient who was later identified as having SARS-CoV disease.

The CDC has written specific guidance for patient transport by EMS personnel in IV. Infection Control for Prehospital Emergency Medical Services (EMS) of the Supplement I: Infection Control in Healthcare, Home, and Community Settings of the CDC's Public Health Guidance for Community-Level Preparedness and Response to Severe Acute Respiratory Syndrome (SARS) Version 2 (<http://www.cdc.gov/sars/guidance/i-infection/prehospital.html>). The following are essential for Patient Transport:

- Transport personnel should be notified in advance when SARS is suspected in a patient needing emergency transport
- Prehospital care personnel should follow the updated Standard Precautions recommendations to prevent the spread of respiratory infections described in III.B above. These include promoting [respiratory hygiene/cough etiquette](#) and using Droplet Precautions, in addition to Standard Precautions, for all patients with symptoms of a respiratory infection.

Key emergency vehicle transport factors:

- Involve the fewest EMS personnel required
- Family members and other contacts of SARS patients should not ride in the ambulance if possible.

DISPATCH



- When possible, use vehicles that have separate driver and patient compartments that can provide separate ventilation to each area. Close the door/window between these compartments before bringing the patient on board. Set the vehicle's ventilation system to the non-recirculating mode to maximize the volume of outside air brought into the vehicle. If the vehicle has a rear exhaust fan, use it to draw air away from the cab, toward the patient-care area, and out the back end of the vehicle. Some vehicles are equipped with a supplemental recirculating ventilation unit that passes air through HEPA filters before returning it to the vehicle.
- If a vehicle without separate compartments and ventilation must be used, open the outside air vents in the driver area and turn on the rear exhaust ventilation fans to the highest setting. This will create a negative pressure gradient in the patient area.
- If possible, place a surgical mask on the patient to contain droplets expelled during coughing. If this is not possible (i.e., would further compromise respiratory status, difficult for the patient to wear), have the patient cover the mouth/nose with tissue when coughing.
- Oxygen delivery with a non-rebreather face mask may be used to provide oxygen support during transport. If needed, positive-pressure ventilation should be performed using a resuscitation bag-valve mask, preferably one equipped to provide HEPA or equivalent filtration of expired air.
- If a patient has been mechanically ventilated before transport, HEPA or equivalent filtration of airflow exhaust should be available. (EMS organizations should consult their ventilator equipment manufacturer to confirm appropriate filtration capability and the effect of filtration on positive-pressure ventilation.)
- Cough-generating procedures (e.g., mechanical ventilation, nebulizer treatment) should be avoided during prehospital care.

Personal Protective Equipment:

- Prehospital care providers who directly handle a patient with SARS-CoV disease or who are in the compartment with the patient should wear PPE as recommended for Standard, Contact, and All Precautions. These include the following:
 - Disposable isolation gown, pair of disposable patient examination gloves, eye protection (i.e., goggles or face shield).
 - Respiratory protection (i.e., N-95 or higher-level respirator) **IAFF recommends P100 respirators** for all patients with respiratory symptoms such as cough
- Personnel in the driver's compartment who will have no direct patient contact should wear an N-95 or higher-level respirator during transport.
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- Drivers who also provide direct patient care should remove all PPE, with the exception of the respirator, and perform hand hygiene after completing patient care and before entering driver's compartment to avoid contaminating the compartment.

Safe Work Practices:

- Avoid touching one's face with contaminated gloves.
- Avoid unnecessary touching of surfaces in the ambulance vehicle.
- Arrange for the receiving facility staff to meet the patient at the ambulance door to limit the need for EMS personnel to enter the emergency department in contaminated PPE.
- Remove and discard PPE after transferring the patient at the receiving facility and perform hand hygiene. Treat used disposable PPE as medical waste.

Post-Transport Management of the Contaminated Vehicle:

- Follow standard operating procedures for the containment and disposal of regulated medical waste.
- Follow standard operating procedures for containing and reprocessing used linen. Wear appropriate PPE when removing soiled linen from the vehicle. Avoid shaking the linen.
- Clean and disinfect the vehicle in accordance with standard operating procedures. Personnel performing the cleaning should wear a disposable gown and gloves (a respirator should not be needed) during the clean-up process; the PPE should be discarded after use. All surfaces that may have come in contact with the patient or materials contaminated during patient care (e.g., stretcher, rails, control panels, floors, walls, work surfaces) should be thoroughly cleaned and disinfected using an EPA-registered hospital disinfectant in accordance with manufacturer's recommendations.
- Clean and disinfect reusable patient-care equipment according to manufacturer's instructions.

What should you do if you believe you have been exposed?

According to Supplement I: Infection Control in Healthcare, Home, and Community Settings of the CDC's Public Health Guidance for Community-Level Preparedness and Response to Severe Acute Respiratory Syndrome (SARS) Version2 (at:

<http://www.cdc.gov/sars/guidance/I-infection/occupational.html>)

DISPATCH



Management of asymptomatic healthcare workers with unprotected high-risk exposures

An unprotected high-risk exposure occurs when a healthcare worker is in a room with a SARS patient during an aerosol-generating procedure or event and the recommended infection control precautions are either absent or breached. If a healthcare worker has an unprotected high-risk exposure but has no symptoms of SARS-CoV disease, the worker:

- Should be excluded from duty (e.g., administrative leave) for 10 days after the date of the last high-risk exposure.”
- Should be actively monitored for the development of fever and/or respiratory symptoms for 10 days after the date of the last high-risk exposure.

Management of asymptomatic healthcare workers with unprotected exposures that are not high risk

Unprotected exposures that are not high risk occur when a healthcare worker is in a room or patient-care area with a SARS patient (not during a high-risk procedure) and the recommended infection control precautions are either absent or breached. If a healthcare worker has an unprotected, non-high-risk exposure and has no symptoms of SARS-CoV disease, the healthcare worker:

- Need not be excluded from duty.
- Should be vigilant for the development of fever and/or respiratory symptoms (i.e., measure and record body temperature twice daily for 10 days following the date of last unprotected exposure, and immediately notify the healthcare facility if symptoms develop.)
- Should be actively monitored for the development of fever and lower respiratory symptoms before reporting to duty.

Surveillance of asymptomatic healthcare workers who have cared for SARS patient(s) but have no known unprotected exposures

- Instruct workers to be vigilant for the development of fever and/or respiratory symptoms, measure and record body temperature twice daily throughout the 10-day period following the date of last protected contact with a SARS patient, and immediately notify the healthcare facility if symptoms develop.
- Implement active follow-up surveillance of these workers for 10 days following the last protected exposure

DISPATCH



Management of symptomatic healthcare workers

- Any healthcare worker who has cared for or been exposed to a SARS patient and who develops fever and/or respiratory symptom(s) within 10 days after exposure or patient care should:
 - Immediately contact infection control, occupational health or designee in each facility where s/he works; and
 - Report to the predetermined location for clinical evaluation. (During periods of increased SARS activity in the healthcare facility and/or community, this recommendation extends to all symptomatic personnel working in the facility, regardless of whether they have had contact with a SARS patient.)
- Any healthcare worker who develops symptoms or fever while at work should immediately put on a surgical mask and notify the appropriate facility contact (e.g., occupational health, infection control, or other designee) and then report to the designated location for clinical evaluation.
- Symptomatic healthcare personnel should be managed in accordance with the recommendations in [Clinical Guidance on the Identification and Evaluation of Possible SARS-CoV Disease among Persons Presenting with Community-Acquired Illness.](#)

Supplement D: Community Containment Measures, Including Non-Hospital Isolation and Quarantine of the Public Health Guidance for Community-Level Preparedness and Response to Severe Acute Respiratory Syndrome (SARS) Version 2 (<http://www.cdc.gov/sars/guidance/D-quarantine/index.html>) and the local health department should be consulted for decisions regarding activity restrictions outside the workplace for workers in all the above categories.

For More Information and Frequently Asked Questions (FAQs), Check Out:

- National Institute for Occupational Safety and Health (NIOSH): <http://www.cdc.gov/niosh/topics/SARS/>
- Centers for Disease Control and Prevention (CDC): <http://www.cdc.gov/sars/index.html>
 - CDC, Public Health Guidance for Community-Level Preparedness and Response to SARS: <http://www.cdc.gov/sars/guidance/index.html>
 - CDC, SARS Infection Control: <http://www.cdc.gov/sars/infection/index.html>
- Canadian Centre for Occupational Health and Safety (CCOHS): <http://www.ccohs.ca/oshanswers/diseases/sars.html>