



ALBION STREET CENTRE
INFECTION PREVENTION & CONTROL UNIT

Infection Prevention & Control Unit
Albion Street Centre
150-154 Albion Street
SURRY HILLS NSW 2010

Phone 9332 9712
Fax 9380 6572
Email albicr@sesiahs.health.nsw.gov.au

RESOURCE PACKAGE NUMBER 23

SEVERE ACUTE RESPIRATORY SYNDROME (SARS)

HISTORICAL OVERVIEW

Severe acute respiratory syndrome (SARS), a viral respiratory illness, was first reported in Guangdong province of southern China in late 2002. By late February 2003, the disease began to spread around the world and on 12th March 2003 the World Health Organisation (WHO) issued a global alert.

The virus spread to more than two dozen countries throughout the world between February and June 2003 before the SARS global outbreak was contained. The areas with the majority of SARS cases were parts of China, Hong Kong, Taiwan, Vietnam, Canada, and Singapore. As a result of public health measures, the SARS outbreak was over by early July 2003 when WHO announced on 5th July that human-to-human transmission of SARS had been interrupted.

According to WHO, a total of 8,098 people worldwide became ill with SARS during the 2003 outbreak. Of these, 774 died. In Australia six people were diagnosed with probable SARS and reported to WHO. There were no deaths. In NSW there were a total of 56 patients investigated who fitted the WHO definition of 'suspect' or 'probable' SARS. All cases had traveled to a former SARS affected area and all completely recovered. Only one case was confirmed by laboratory testing, and is in fact Australia's only confirmed case. This was a foreign traveller infected in Hong Kong en route to Australia in late February 2003, prior to the WHO global alert. The diagnosis was made retrospectively and a thorough investigation found no evidence of further spread in the community in Australia.

Overseas in late 2003 several people became infected with SARS following laboratory accidents. The first infections not linked to laboratory accidents since WHO declared the global outbreak of SARS was over in July 2003 were reported in the Guangdong province of China in early 2004 with three new infections reported. Again in April 2004 a cluster of cases linked with a laboratory incident was reported

coming from AnHui and Beijing, China, thus confirming the potential for the disease to re-emerge and the need for ongoing vigilance.

The 2003 SARS epidemic highlighted the speed with which infections may spread around the world, and the need for a rapid and coordinated international public health response.

SARS is caused by a new coronavirus, called SARS-associated coronavirus (SARS-CoV). Coronaviruses are a group of viruses that have a halo or crown-like (corona) appearance when viewed under a microscope. These viruses are a common cause of mild to moderate upper-respiratory illness in humans and are associated with respiratory, gastrointestinal, liver and neurologic disease in animals, including cats, dogs, pigs, mice, and birds.

The early days of the 2003 outbreak was characterised by 20% of all SARS deaths around the world occurring in health care workers caring for patients with SARS. Transmission to health care workers appears to have occurred after close contact with symptomatic individuals before recommended infection control precautions were implemented. Therefore the appropriate and stringent infection control recommendations should be applied to anyone *suspected* of SARS at triage.

TRANSMISSION

To be at risk of contracting SARS, a person must have exposure to the virus. During periods when there are no longer countries with ongoing human transmission, the possibility of exposure to the SARS virus is highly unlikely and therefore the risk of contracting SARS is extremely low. Currently, the risk of people in Australia contracting SARS is low.

SARS seems to be spread by close person-to-person contact or contact with contaminated environmental surfaces. The virus that causes SARS is thought to be transmitted most readily by respiratory droplets produced when an infected person coughs or sneezes. Droplet spread can happen when droplets from the cough or sneeze of an infected person are propelled a short distance (generally up to 1 metre) through the air and deposited on the mucous membranes of the mouth, nose, or eyes of persons who are nearby. The virus also can spread when a person touches a surface or object contaminated with infectious droplets and then touches his or her mouth, nose, or eyes. Rarely, the virus may spread in the air from very ill patients.

People who are infected with the virus but do not yet have symptoms are not thought to be infectious.

SYMPTOMS

In general, SARS begins with a high fever with a temperature greater than $>38.0^{\circ}\text{C}$. Other symptoms may include headache, an overall feeling of discomfort, chills, dizziness, muscle aches, poor appetite and sore throat. Some people also have mild respiratory symptoms at the outset. About 10 –20% of patients have diarrhoea. After 2 to 7 days, SARS patients may develop a dry cough. Most patients develop severe pneumonia and about 20% will require artificial ventilation in an intensive care unit.

Overall, about 15% of those diagnosed with SARS have died, with a higher risk in the elderly or those with chronic disease.

DIAGNOSIS

During the 2003 epidemic, the disease was suspected in someone who had symptoms of SARS and, in the previous 10 days, had travelled to an area affected by SARS or had close contact with a SARS case. If they had chest X-ray changes of pneumonia then SARS was more likely.

Several laboratory tests can now be used to detect SARS-CoV. A reverse transcription polymerase chain reaction (RT-PCR) test can detect SARS-CoV in clinical specimens such as blood, stool, and nasal secretions. PCR (or polymerase chain reaction) is a laboratory method for detecting the genetic material of an infectious disease agent in specimens from patients. This type of testing has become an essential tool for detecting infectious disease agents.

Serologic testing also can be performed to detect SARS-CoV antibodies produced after infection. A serologic test is a laboratory method for detecting the presence and/or level of antibodies to an infectious agent in serum from a person. Antibodies are substances made by the body's immune system to fight a specific infection.

Finally, viral culture has been used to detect SARS-CoV. For a viral culture, a small sample of tissue or fluid that may be infected is placed in a container along with cells in which the virus can grow. If the virus grows in the culture, it will cause changes in the cells that can be seen under a microscope.

TREATMENT

The Center for Disease Control and Prevention (CDC) recommend that patients with SARS receive the same medical treatment that would be used for a patient with any serious community-acquired atypical pneumonia. SARS-CoV is being tested against various antiviral drugs to see if an effective treatment can be found.

INCUBATION PERIOD

The incubation period for SARS is typically 2 to 7 days, although in some cases it may be as long as 10 days. In a very small proportion of cases, incubation periods of up to 14 days have been reported.

PERIOD OF COMMUNICABILITY

Available information suggests that persons with SARS are most likely to be contagious only when they have symptoms, such as fever or cough. Patients are most contagious during the second week of illness. However, as a precaution against spreading the disease, the CDC recommend that persons with SARS limit their interactions outside the home (such as, by not going to work or to school) until 10 days after their fever has subsided and their respiratory (breathing) symptoms have resolved.

To date, no cases of SARS have been reported among persons who were exposed to a SARS patient before the onset of the patient's symptoms.

INFECTION CONTROL

The importance of strict, continued compliance with infection control recommendations to minimise SARS transmission should be emphasised to all staff.

Infection control measures should commence from the time of assessing an individual presenting with suspected SARS symptoms. The person performing the assessment should wear gloves and a P2 (N95 equivalent) mask if possible, or at minimum a surgical mask. If the patient is coughing, the assessor should wear a disposable, long sleeve gown and eye/face protection. The assessor should avoid touching their own eyes, nose and mouth to avoid self inoculation with the virus.

Used gloves, masks and gowns should be removed and disposed of in a plastic garbage bag, which is then tied and disposed in general waste. Reusable equipment such as eye/face protection should be washed and dried as per the manufacturers instructions.

The assessor should wash their hands immediately after completing the assessment or interview irrespective of glove use.

Infection control measures for suspected, probable or confirmed SARS patients should include:

- Standard Precautions
- Contact Precautions
- Droplet Precautions
- Airborne Precautions

If airborne precautions cannot be fully implemented (ie an isolation room with negative pressure relative to the surrounding area), patients should be placed in a single room preferably with its own bathroom facilities.

The use of a P2 (N95 equivalent) mask should be worn for ALL persons entering the room. [The "N" means "Not resistant to oil". The "95" refers to 95% filter efficiency.] Staff members should not have contact with a SARS case until they have "fit checked" their mask to ensure that there are no air leaks round the mask.

Patient movement should be restricted where possible. Patients who need to leave their rooms should do so only with a mask in place. Patients, suspect or probable cases of SARS, should not wear a P2 (N95 equivalent) mask with an exhalation valve, as this valve could disseminate the virus into the environment.

For full Infection Control guidelines for SARS refer to *Interim Australian Infection Control Guidelines for Severe Acute Respiratory Syndrome (SARS)* available from www.health.gov.au/sars/guidelines/index.htm

NOTIFICATION TO THE PUBLIC HEALTH UNIT

SARS was made a notifiable disease by hospital chief executive officers (or general managers) from 16th April 2003 and by medical practitioners and laboratories from 6th June 2003. All infectious diseases notification forms are available from Public Health Units and on the NSW Health website:

www.health.nsw.gov.au/public-health/forms

REFERENCES

NSW Department of Health 2003, Notification of Infectious Diseases Under the Public Health Act 1991, PD2005_359, Communicable Diseases Branch, Sydney

NSW Department of Health 2007, Infection Control Policy, PD2007_036, AIDS/Infectious Diseases Branch, Sydney.

NSW Department of Health 2004, Key Recommendations of the NSW Taskforce on SARS (TSARS), Sydney.

Commonwealth Department of Health and Ageing, Communicable Diseases Network Australia 2003, Interim Australian Infection Control Guidelines for Severe Acute Respiratory Syndrome (SARS), Australian Government Department of Health and Ageing, Canberra.

WEBSITES

www.health.gov.au/sars/guidelines/index.htm

www.cdc.gov/ncidod/sars/

www.who.int/csr/sars/en/

SUGGESTED VIDEOS – AVAILABLE THROUGH THE IPCU

- # 42 SARS: The True Story (55 minutes)
- # 52 Confronting Epidemics