Health Canada Santé Canada

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Management of Severe Acute Respiratory Syndrome (SARS) in Adults: Interim Guidance for Health Care Providers

The material provided on this site has been produced through consultations among federal, provincial, territorial and local public health officials as well as experts in infectious diseases across Canada and is aimed at producing scientifically sound guidelines on SARS for health professionals. Health Canada would like to acknowledge the significant and ongoing contributions of all participating stakeholders.

This information sheet is intended for clinicians who are managing adult cases of Severe Acute Respiratory Syndrome (SARS). **Please be advised that as more information about this illness becomes available, guidance provided below may change**.

Case Definitions

Case definitions have been developed. Case definitions are subject to revision as further epidemiological and laboratory information becomes available. Please refer to the Health Canada website at: http://www.sars.gc.ca./

Infection Control

Infection control recommendations have been developed Infection control practices are subject to revision as further epidemiological and laboratory information becomes available. For full details of infection control practices for SARS cases, please refer to the Health Canada website at: http://www.sars.gc.ca/.

Diagnostic Testing

Recommended laboratory investigations for SARS have been developed. Recommended laboratory investigations are subject to revision as further information becomes available. For full details of laboratory testing recommendations, please refer to the Health Canada website at: http://www.sars.gc.ca./

Public Health Management

Public Health management recommendations hare been developed Public Health recommendations are subject to revision as further information becomes available. For full details of Public Health management recommendations, please refer to the Health Canada website at: http://www.sars.gc.ca./

Management of Probable Cases

- Notify the local public health authority.

- Detailed and repeated questioning about respiratory illness in contacts (work, school, social and religious gatherings, etc)
- Ensure that appropriate infection control procedures are in place (see above).
- Ensure that a detailed travel and contact history are obtained (including hotels, tour groups, time spent in airports in affected areas, flight information, health care facilities, etc.).
- Investigations:
  - Laboratory testing: see http://www.sars.gc.ca/
  - Chest x-ray
  - Oxygen saturation
  - Other diagnostic testing, as indicated
- Notify the patient/patient's family that the local public health authority will contact them for follow-up.

Therapy for probable cases

The most efficacious therapeutic regimen, if any, is not known. The following guidance is based on clinical experience to date and is subject to revision as further information becomes available. Several potential treatment modalities were considered.

***Antibiotics for possible community-acquired pneumonia*:**

At present, a validated diagnostic test for SARS is not yet available and there is inherent uncertainty in making a SARS diagnosis at the time of initial presentation. Treatment for possible community acquired pneumonia may be considered:

. Broad-spectrum antibiotics for severe pneumonia as per the Canadian guidelines for the management of community-acquired pneumonia. Antibiotic therapy may be modified when culture results become available.

Table. Empirical antimicrobial selection for adult patients with community-acquired pneumonia

Type of patient, factor(s) involved	Treatment regimen	
	First Choice	**Second Choice**
Outpatient without Modifying Factors	Macrolide[a]	Doxycycline
Outpatient with Modifying Factors **CHRONIC OBSTRUCTIVE LUNG DISEASE (no recent antibiotics or oral steroids within past 3 months)**	Newer macrolide[b]	Doxycycline
CHRONIC OBSTRUCTIVE LUNG DISEASE (recent antibiotics or oral steroids within past 3 mos); *H. influenzae* and enteric gram-negative rods implicated	"Respiratory" fluoroquinolone[c]	(Amoxicillin/clavulanate + macrolide) *OR* (2nd-Generation cephalosporin + macrolide)
Suspected macroaspiration: oral anaerobes	Amoxicillin/clavulanate ± macrolide	"Respiratory" fluoroquinolone (e.g. levofloxacin) + (clindamycin or metronidazole)
<u>Nursing Home Resident</u> ***Streptococcus pneumoniae*, enteric gram-negative rods, *H. influenzae* implicated** **Hospitalized**	"Respiratory" fluoroquinolone alone *OR* (amoxicillin/clavulanate + macrolide) Identical to treatment for other hospitalized patients (see below)	2nd-Generation cephalosporin + macrolide
Hospitalized patient on medical ward ***S. pneumoniae, L. pneumophila, C. pneumoniae* implicated**	"Respiratory" fluoroquinolone	2^{nd}-, 3^{rd}-, or 4^{th} -Generation cephalosporin + macrolide

Hospitalized patient in ICU		
***P. aeruginosa* not suspected; S. *pneumoniae, L. pneumophila, C. pneumoniae*, enteric gram-negative rods implicated**	IV "respiratory" fluoroquinolone + cefotaxime (or ceftriaxone or β-lactam/β lactamase inhibitor)	IV macrolide + Cefotaxime (or ceftriaxone or βlactam/ βlactamase inhibitor)
***P. aeruginosa* suspected**	Antipseudomonal fluoroquinolone (e.g. ciprofloxacin) + antipseudomonal β-lactam or aminoglycoside	Triple therapy with antipseudomonal βlactam (e.g. ceftazidime, piperacillin-tazobactam, imipenem, or meropenem) + aminoglycoside (e.g. gentamicin, tobramycin, or amikacin) + macrolide

a Erythromycin, azithromycin, or clarithromycin.
b Azithromycin or clarithromycin.
c Levofloxacin, gatifloxacin, or moxifloxacin; trovafloxacin is not recommended because of potential severe hepatotoxicity.

(Source: table adapted from *Mandell et al., CIDS/CTS Guidelines for CAP.* Clinical Infectious Diseases 2000;31:383-421)

Ribavirin

In vitro susceptibility testing at Health Canada's National Microbiology Laboratory and the U.S. Army Medical Research Institute of Infectious Diseases have failed to demonstrate direct anti-viral activity of ribavirin against two isolates of the SARS-related coronavirus at non-toxic concentrations effective for Lassa fever virus and other hemorrhagic fever viruses. In a retrospective SARS cohort study in Toronto, ribavirin use did not result in a decrease in ICU admission, ventilator use or mortality. However, the study did not have sufficient power to detect small differences in these outcomes. Given these data available at this time , ribavirin does not appear to be effective against the SARS-related coronavirus and reports of serious and unexpected adverse drug reactions have started to surface. As such, the working group recommends that the use of ribavirin be preferentially limited to research studies.

Steroids

The role of steroids in the management of SARS is unclear, but anecdotal information from Hong Kong has demonstrated that some patients may benefit from steroids. This observation must be confirmed by systematic studies before recommendations for its routine use can be made.

Other Therapy

- Preliminary in vitro data suggest activity of alpha-interferon against the SARS-related coronavirus. Additional in vitro work, animal models and clinical studies are needed to further elucidate the potential role of alpha-interferon in the treatment of SARS.
- Ensure adequate hydration
- Treatment of secondary infections, if present
- Oseltamivir is not recommended

Management of Suspect Cases

- Notify the local public health authority.
- Detailed and repeated questioning about respiratory illness in contacts (work, school, social and religious gatherings, etc)
- Ensure appropriate infection control procedures are in place (http://www.sars.gc.ca/). . Ensure that a detailed travel and contact history are obtained.
- Investigations:
  - Obtain a CBC, chest X-ray and oxygen saturation, as well as any other diagnostic tests that are clinically indicated
  - Repeat CBC, chest X-ray and oxygen saturation, if indicated
  - Laboratory testing: see http://www.sars.gc.ca./

- Provide patient with a fact sheet on SARS (available at: http://www.sars.gc.ca/)
- Hospitalize if indicated
- Advise the patient to seek medical attention immediately if symptoms worsen. Tell the patient to call ahead to the hospital and advise them of their symptoms and of their arrival.
- Advise the patient of the Public Health recommendations regarding isolation and follow up if discharged home
  - See the latest Public Health Management Recommendations (http://www.sars.gc.ca/)
- Supportive therapy
  - Ensure adequate hydration

Management of Symptomatic Patients Who Have Appropriate Travel History or Contact with A Case but Who Do Not Meet The Definition of A Probable or Suspect Case

- Infection control procedures: routine practices.
- Ensure that a detailed travel and contact history are obtained.
- Laboratory testing: as clinically indicated.
- Provide the patient with a fact sheet on SARS (http://www.sars.gc.ca/)
- Advise the patient to seek medical attention immediately if symptoms worsen. Tell the patient to call ahead to the physician's office or hospital to advise them of their symptoms and of their arrival.

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- Advise the patient of the latest Public Health recommendations regarding isolation and
- follow up
  - See the latest Public Health Management Recommendations (http://www.sars.gc.ca/).

Management of Asymptomatic Patients Who Have Appropriate Travel History or Contact With A Case

- Infection control procedures: routine practices.
- Ensure that a detailed travel and contact history are obtained.
- Provide the patient with a fact sheet on SARS (http://www.sars.gc.ca/)
- Advise the patient of the Public Health recommendations regarding follow up
  - See the latest Public Health Management Recommendations (http://www.sars.gc.ca/).
- Advise the patient to seek medical attention immediately if they develop a fever (temperature >38.0°C) and any other symptoms. Tell the patient to call ahead to the physician's office or hospital to advise them of their symptoms and of their arrival.

Discharge and Follow-up of Convalescent Cases

WHO has released preliminary guidelines for the safe discharge of patients after recovery from SARS. Please refer to the WHO website at: http://www.who.int/csr/sars/discharge/en/

It is recommended that a case is medically fit for discharge if:

- Afebrile for 48 hours
- Resolving cough
- Oxygen saturation is normal or returned to baseline if previously abnormal
- White cell (lymphocyte) count, platelet count, creatinine phosphokinase and liver function tests are returning to normal
- Chest X-ray changes are improving

Recommended follow-up for convalescent cases:

- Patients should be asked to monitor and record their temperature twice daily. If they have an elevated temperature of 38 degrees and above on two consecutive occasions they should report to the health care facility from which they were discharged.
- At a minimum, follow up is recommended at one week. Repeat a chest x-ray, complete blood count and any other blood tests that were previously abnormal. The patient should be followed up by the health care facility from which they were discharged. In addition, the clinician may decide that the patient needs to be followed up before one week. Subsequent follow-ups are recommended until the chest x-ray and patient's health returns to normal.
- Collect convalescent serology at 3 weeks after the date of onset of symptoms.
- Advise the patient of the Public Health recommendations regarding isolation once returning home
  - See the latest Public Health Management Recommendations (www.sars.gc.ca)

Definition of Acute Respiratory Distress Syndrome (ARDS)

Respiratory failure caused by various acute pulmonary injuries and characterized by non-cardiogenic pulmonary edema, respiratory distress and hypoxemia (For details, please refer to: THE MERCK MANUAL, Sec. 6, Ch. 67, ARDS).