

Respiratory and Direct Contact

Severe Acute Respiratory Infection (SARI)

Date Reviewed: January, 2015

Section: 2-170

Page 1 of 11

Notification Timeline

From Lab/Practitioner to Public Health: Immediate.

From Public Health to Ministry of Health: Upon notification from lab or physician.

Public Health Follow-up Timeline: Within 24-48 hours.

Information

Case Definition (adapted from Public Health Agency of Canada, 2013)

To confirm the diagnosis of a case of SARI, the case must meet criteria in each of the categories listed below for hospitalized cases (A) or for cases who are deceased (B):

1. Respiratory symptoms.
2. Severity.
3. Unknown diagnosis.
4. Epidemiological exposure, as detailed in the specific case definitions below.

SARI Case (A)

A person admitted to hospital with the following:

1. Respiratory symptoms, i.e.:

- Fever¹ of over 38 degrees Celsius **AND** new onset of (or exacerbation of chronic) cough or breathing difficulty.

AND

2. Evidence of severe illness progression, i.e.:

- Either radiographic evidence of infiltrates consistent with pneumonia, or a diagnosis of acute respiratory distress syndrome (ARDS) or severe influenza-like illness (ILI),² which may also include complications such as encephalitis, myocarditis or other severe and life threatening complications.

AND

3. Either admission to the ICU/other area of the hospital where critically ill patients are cared for OR mechanical ventilation.

AND

¹ As per the ILI definition, fever may not be prominent in patients under 5 years or 65 years and older as well as in immunosuppressed individuals. Failure to take temperature should not rule out a history of self-reported fever. Clinical judgment should always prevail with regard to these groups.

² **Severe ILI:** In addition to the symptoms of ILI noted below, severe ILI may also include complications such as encephalitis, myocarditis or other severe and life threatening complications.

Respiratory and Direct Contact

Severe Acute Respiratory Infection (SARI)

Date Reviewed: January, 2015

Section: 2-170

Page 2 of 11

4. No alternate diagnosis within the first 72 hours³ of hospitalization, i.e.:

- Results of preliminary clinical and/or laboratory investigations, within the first 72 hours of hospitalization, cannot ascertain a diagnosis that reasonably explains the illness.

AND

5. One or more of the following exposures/conditions, i.e.:

- Residence, recent travel (within ≤ 14 days of illness onset) to a country where human cases of novel influenza virus or other emerging/re-emerging pathogens have been detected or are known to be circulating in animals⁴.
- Close contact⁵ with an ill person who has been to an affected area/site within the 14 days prior to onset of symptoms.
- Exposure to settings in which there had been mass die offs or illness in domestic poultry or swine in the previous six weeks.
- Occupational exposure involving **direct** health care, laboratory or animal exposure, i.e.:

- **Health care exposure** involving health care workers who work in an environment where patients with SARI are being cared for, particularly patients requiring intensive care.

OR

- **Laboratory exposure** in a person who works directly with Laboratory biological specimens.

OR

- **Animal exposure** in a person employed as one of the following:
 - Poultry/swine farm worker;
 - Poultry/swine processing plant worker;
 - Poultry/swine culler (catching, bagging, transporting or disposing of dead birds/swine);

³ It is suggested that laboratory investigation, including laboratory testing for influenza and other respiratory pathogens should be started as soon as possible upon presentation (i.e., do not wait 72 hours to initiate testing) and it requires immediate infection control and public health action. Refer to [Attachment – Severe Acute Respiratory Illness \(SARI\) Screening Tool](#) and discuss with the Medical Health Officer and Infection Control.

⁴ Refer to the World Health Organization Human Animal Interface for the most recent information http://www.who.int/influenza/human_animal_interface/en/

⁵ Close contact is defined as: Anyone who provided care for the patient, including a health care worker or family member, or who had other similarly close physical contact; Anyone who stayed at the same place (e.g. lived with, visited) as a probable or confirmed case while the case was ill.

Respiratory and Direct Contact

Severe Acute Respiratory Infection (SARI)

Date Reviewed: January, 2015

Section: 2-170

Page 3 of 11

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- Worker in live animal market;
 - Dealer or trader of pet birds, pigs or other potentially affected animals;
 - Chef working with live or recently killed domestic poultry, swine or other potentially affected animals;
 - Veterinarian worker;
 - Public health inspector/regulator.

OR

SARI Case (B)

A deceased person with the following:

1. A history of respiratory symptoms, i.e.:

- History of unexplained acute respiratory illness (including fever and new onset of (or exacerbation of chronic) cough or breathing difficulty) resulting in death.

AND

2. Autopsy performed with findings consistent with SARI, i.e.:

- Autopsy findings consistent with the pathology of ARDS without an identifiable cause.

AND

3. No alternate diagnosis that reasonably explains the illness.

AND

4. One or more of exposures/conditions, as listed in (A).

SARI Case Exclusion Criteria

A person should not be reported as a case of SARI if an alternate diagnosis can reasonably explain their illness.

Health Care Facility Surveillance for SARI

It is recommended that regions/jurisdictions use the [Attachment – Severe Acute Respiratory Illness \(SARI\) Screening Tool](#) in their acute and integrated health care facilities to ensure the early recognition of potential SARI cases and the prompt notification of Infection Control and Medical Health Officers (MHOs). This will ensure that sporadic cases of SARI are reported and assessed using this case definition.

Respiratory and Direct Contact

Severe Acute Respiratory Infection (SARI)

Date Reviewed: January, 2015

Section: 2-170

Page 4 of 11

Causative Agent

Varies; includes several emerging respiratory pathogens including but not limited to influenza A (H5N1), other novel influenza virus, SARS-CoV (coronavirus), etc.

Symptoms

- Fever (> 38 degrees Celsius).
- New onset of (or exacerbation of chronic) cough or breathing difficulty.
- Radiographic evidence of infiltrates consistent with pneumonia or acute respiratory distress syndrome (ARDS) or Severe ILI.

Incubation Period

Varies depending on the organism; for example:

- SARS-CoV is 3 to 10 days.
- Avian influenza ranges from 2-8 days and as long as 17 days.

Reservoir/Source

Varies depending on the organism; for example:

- SARS-CoV is unknown.
- Avian influenza – primarily birds, but can affect humans and pigs as well.

Mode of Transmission

- Direct contact with respiratory secretions or body fluids of a confirmed, suspect or probable case or direct contact with suspected animals implicated in transmission.
- Airborne via aerosol-generating medical procedures.⁶
- SARS-CoV – person to person by close contact. Primarily through droplets and fomites.
- Avian influenza – refer to [Respiratory and Direct Contact – Influenza, Avian](#) section of the manual. (The virus is transmitted through close contact with dead or sick birds. There is limited human-to-human transmission occurring at this time.)
- MERS-CoV – contact with camels or their milk or urine; person to person by close contact.

⁶ **Aerosol Generating Medical Procedure:** A medical or surgical procedure that involves manipulation or stimulation of a patient's airway in a manner that may stimulate coughing and/or promote the generation of aerosols.

Respiratory and Direct Contact

Severe Acute Respiratory Infection (SARI)

Date Reviewed: January, 2015

Section: 2-170

Page 5 of 11

Period of Communicability

- Varies depending on the specific organism suspected or identified.
- Not completely understood for SARS-CoV – initial studies suggest that transmission does not occur before onset of clinical symptoms and maximum period of communicability is less than 21 days.
- Difficult to determine when there is no evidence of direct human-to-human transmission (avian influenza).

Specimen Collection and Transport

Appropriate testing for routine respiratory pathogens should be reinforced.

The following are suggested laboratory diagnostic tests that should be considered in the **initial** laboratory work-up of patients presenting with symptoms of SARI. Relevant medical history, as well as clinical signs and symptoms will dictate appropriate ongoing testing for each patient, (The Public Health Agency of Canada, 2013).

Specimens should be sent on a STAT basis. Refer to the Saskatchewan Disease Control Laboratory (SDCL) Compendium of Tests⁷, Time or Temperature Sensitive, STAT and Outbreak Samples Policy for details on submitting STAT samples. The MHO may be able to assist in expediting testing.

The **initial** specimens must be clearly marked “SARI Screen”.

- Blood culture.
- Sputum for C&S.
- Nasopharyngeal swab in viral transport for:
 - influenza PCR;
 - respiratory virus culture;
 - direct antigen testing.
- CBC and differential.
- Liver function tests.
- Stool for viral studies (only if the patient has diarrhea).
- Arrange for other testing as recommended by MHO and/or Infectious Disease (ID) Specialist.

⁷ <http://sdcl-testviewer.ehealthsask.ca/>

Respiratory and Direct Contact

Severe Acute Respiratory Infection (SARI)

Date Reviewed: January, 2015

Section: 2-170

Page 6 of 11

Methods of Control/Role of Investigator

Infection control procedures are paramount. Contact, droplet and airborne precautions must be implemented as necessary for patients in health care facilities and should be done in consultation with Infection Control and MHO. Refer to [Infection Prevention and Control Measures and Initial Management of Persons who May Be Infected with a Novel Respiratory Virus](#).

Prevention and Education

Refer to the [Respiratory and Direct Contact Introduction and General Considerations](#) section of the manual that highlights topics for client education and provides information on high-risk groups and activities.

Refer to [Respiratory and Direct Contact – Influenza, Avian](#) section of the manual for additional prevention measures if poultry is involved as a host or source of infection.

SARI alerts should trigger MHOs to inform clinicians about the SARI screening tool and reinforce the “Think, Tell and Test” message.

- **THINK** about the possibility of an emerging respiratory infection, e.g., novel respiratory virus and how the spread can be prevented (implementation of appropriate infection control measures).
- **TELL** the local MHO and local infection control and consult with ID Specialist.
- **TEST** for pathogens only after appropriate consultation with the MHO and ID Specialist and based on clinical and epidemiologic symptoms.

Refer to [Specimen Collection and Transport](#) above, [Attachment – Severe Acute Respiratory Illness \(SARI\) Screening Tool](#) or [Laboratory Testing for Persons Who May Be Infected with a Novel Respiratory Virus](#).

- Educate cases and contacts on the appropriate infection control measures that must be taken to reduce the spread.
- Provide education and instructions for staff who have cared for the case before appropriate precautions were implemented (i.e., had unprotected close contact with the case). This should include specific advice on how to self-monitor for fever and symptoms of respiratory illness for 14 days.

Respiratory and Direct Contact

Severe Acute Respiratory Infection (SARI)

Date Reviewed: January, 2015

Section: 2-170

Page 7 of 11

Management

I. Case

Contact, droplet and airborne precautions must be implemented as necessary for all clients being investigated for SARI.

History

- Complete the [Attachment – Severe Acute Respiratory Illness \(SARI\) Screening Tool](#) and [Attachment – Emerging Respiratory Pathogens and Severe Acute Respiratory Infection \(SARI\) Case Report](#).
- If person-to-person spread is typical for the suspected organism, identify those who may have been exposed to this case and follow-up as per [Contact Investigation](#) below.
- If the case was severely ill with the respiratory illness during air travel (i.e., on return to Canada), then the MHO should contact Health Canada's Centre for Emergency Preparedness and Response (CEPR), to request passenger contact information (e.g., airplane manifest). Follow-up of passengers may be considered if the case meets the SARI case definition and there is an identified concern of SARI globally and travel exposure occurred during the incubation period (within 14 days prior to the onset of illness), or the case is found to have another illness with significant public health implications.

Immunization

- Review immunization history specifically for Pneu-P-23 (pneumococcal 23 polysaccharide vaccine) and Influenza. If high-risk, offer as appropriate.

Treatment/Supportive Therapy

- Consult with ID Specialist.

Exclusion

- The period of exclusion will be based on the specific organism.
- While laboratory results are pending, appropriate infection control measures should be implemented including exclusion where appropriate.

Respiratory and Direct Contact

Severe Acute Respiratory Infection (SARI)

Date Reviewed: January, 2015

Section: 2-170

Page 8 of 11

Referrals

- All SARI cases should be managed in consultation with the ID specialist and MHO.
- If no organism is identified, consultation with colleagues to determine further action is recommended.

II. Contacts/Contact Investigation

Close Contact means having cared for, lived with, or had face-to-face (within 1 metre) contact with, or has had direct contact with respiratory secretions and/or body fluids of a person with SARI (Public Health Agency of Canada, 2003).

- Household contacts, intimate contacts and health care providers should be the initial priority.
- Follow-up of the other close contacts should occur if the contacts can be reached within 14 days of their last contact with an infectious case.⁸

The extent of investigation for remote contacts is dependent on the extent of illness in the close contacts and specific organism and will be directed by the MHO.

See [Attachment – Sample Severe Acute Respiratory Infection Contact Management Form](#).

Testing

- Consult with MHO for recommendations.

Prophylaxis/Immunization

- Review immunization history for contacts. The opportunity should be taken to catch up on immunizations for which the contact meets the eligibility criteria.

⁸ This recommendation takes into account the need to prioritize limited public health resources. It is acknowledged that some cases may be symptomatic and missed if no attempt is made to reach potentially ill contacts identified beyond the 14-day time frame. Therefore this should be considered a reasonable approach to contact management and should not preclude any jurisdiction from undertaking a more complete contact investigation.

Respiratory and Direct Contact

Severe Acute Respiratory Infection (SARI)

Date Reviewed: January, 2015

Section: 2-170
Page 9 of 11

Education

- Public health should ensure that contacts receive education/instructions regarding infection control measures, self-monitoring, and who to contact if they become ill with respiratory symptoms. This should include informing the contact that if they develop symptoms (i.e., fever, cough or difficulty breathing), they should do the following:
 - Phone their personal physician so that decisions regarding the need for a clinical assessment can be individualized.
 - Health care providers should be asked to check in with their respective occupational health departments prior to returning to work.
 - Hospital/home isolation⁹ may be recommended until symptoms have resolved/returned to baseline.

Exclusion

- If the close contact is **symptomatic** (i.e., has fever, cough or difficulty breathing), manage as a case.
- No exclusion recommended if the close contact is **asymptomatic** (i.e., is afebrile and has no respiratory symptoms that are different from their baseline status):
 - Self-monitor for fever and new respiratory symptoms for 14 days following last contact with the case.

III. Environment

Child Care Centres/Institutional Control Measures

- Facilities should promptly initiate contact, droplet and airborne precautions (in addition to Routine/Standard Precautions) and consult their local infection control policies. Infection Control and the MHO should be consulted on all SARI cases.
- Patients with suspected SARI should be moved to a designated isolation room ASAP (or negative pressure room if available).

⁹ The symptomatic contact should be isolated in their home unless hospitalization is clinically indicated. These individuals would be instructed to stay home from work/school/other activities, wash their hands frequently and avoid direct face to face contact with others for the duration of their illness. The extent of the isolation requirements should be based on the severity of illness in the case, the composition of the household (e.g., presence of immunocompromised individuals) and any available evidence regarding communicability and ease of transmission.

Respiratory and Direct Contact

Severe Acute Respiratory Infection (SARI)

Date Reviewed: January, 2015

Section: 2-170
Page 10 of 11

Refer to provincial and national guidelines and discuss with the local MHO or Infection Control Practitioner for Infection Control guidance. Initial precautions may be more conservative and include airborne as well as contact and droplet precautions.

Epidemic Measures

If SARI cases are identified in a health care facility, it is important to heighten surveillance to assist in early identification and implementation of control measures and further outbreak control measures as required.

PHAC may be in a position to provide direction. Saskatchewan Ministry of Health will participate in communication messages and provide direction. Specific measures include:

- Use media to clearly inform the general public about the disease, risk of transmission/infection, signs and symptoms, and how to avoid contact with cases.
- Provide HealthLine with updated information to address concerns from the public.
- Ensure that health care workers are well informed of infection control measures and have appropriate facilities for triage.
- Promote the location of the triage facilities to the public.

Respiratory and Direct Contact

Severe Acute Respiratory Infection (SARI)

Date Reviewed: January, 2015

Section: 2-170

Page 11 of 11

References

Public Health Agency of Canada. (2003). *Public health management of cases and clusters of severe respiratory illness (SRI) in the SARS post-outbreak period: Interim guidelines, version 1*. Retrieved October, 2011 from http://www.phac-aspc.gc.ca/sars-sras/pdf/phm-of-cases-and-clusters-sars-pop_e.pdf.

Public Health Agency of Canada. (2013). *Severe acute respiratory illness (SARI) Case Definition*.

Public Health Agency of Canada. (2013). *Protocol for Microbiological Investigations of Severe Acute Respiratory Infections (SARI)*. Retrieved January, 2015 from <http://www.phac-aspc.gc.ca/eri-ire/proto-sari-iras-eng.php>.

Please see the following pages for the Severe Acute Respiratory Illness (SARI) Screening Tool.

SEVERE ACUTE RESPIRATORY ILLNESS (SARI)* SCREENING TOOL

PHYSICIANS to complete

For all persons with severe acute respiratory illness* presenting to the Emergency Department or admitted to Hospital.

*SARI may be caused by respiratory pathogens of known or unknown origin including novel respiratory viruses (Avian Influenza H7N9, H5N1, Novel Coronaviruses e.g. MERS CoV, Wuhan, etc.)

Addressograph/Patient Name:

Date/Time	Place surgical mask on all patients presenting with severe acute respiratory symptoms (unless the patient's clinical condition will be compromised by wearing the mask). Ensure that it remains in place during any transportation of the patient for medical investigations/examinations, including Chest X-ray			
COMPLETE THE FOLLOWING SCREENING QUESTIONS - Indicating Yes or No for each of the criteria				
PATIENT presents with SARI-defining features:				
Yes	No	Fever (over >38° C), <u>and</u>		
Yes	No	Cough or breathing difficulty, <u>and</u>		
Yes	No	Radiographic evidence of infiltrates consistent with pneumonia or Respiratory Distress Syndrome		
NOTE: If answered "NO" to any of the above, there is no need to proceed with this screening tool.				
IN THE 14 DAYS BEFORE THE ONSET OF SYMPTOMS, WERE ANY OF THE FOLLOWING PRESENT:				
Yes	No	1.a) Close contact with a suspect or probable case of SARI <i>[Close contact means having cared for, lived with, or had face to face (within 2 meters) contact with, or having had direct contact with respiratory secretions and/or body fluids of a person with SARI]</i>		
Yes	No	1.b) Travel to a country where there is a Public Health Agency of Canada public health notice of respiratory illness in effect: http://www.phac-aspc.gc.ca/phn-asp/index-eng.php		
Yes	No	1.c) Recent exposure/close contact to a potential source of a SARI which may include reports of illness or die offs in domestic poultry flocks or illness in other animal vectors such as camels or swine.		
Yes	No	2. Current illness is inconsistent with other known cause.		
If you answered " NO " to questions 1 (a, b & c) and 2 The patient has <i>not</i> had any exposures of concern, and <i>does</i> have another explanation for their symptoms			Initiate Contact & Droplet Precautions (in addition to Routine Practices)	
If you answered " YES " to questions 1 (a, b or c) or 2 		Initiate Airborne and Contact precautions; admit patient to a single room with negative pressure (AIIR). If not available, place in a private room with the door closed.		
1. THINK infection control Everyone entering the room should observe hand hygiene, airborne and contact precautions (N95 respirator, gowns, gloves, eye protection).			Done	Not Done
2. TELL your Medical Health Officer (Regional contact ##) or if after hours, the MHO on call. ### The MHO will call Roy Romanow Provincial Laboratory (RRPL) to expedite STAT testing (306-798-1234).			Done	Not Done
3. TELL Infection Control (Monday to Friday) – insert Regional contact ##			Done	Not Done
4. CONSULT an Infectious Disease Specialist – insert Regional contact ##			Done	Not Done
5. TEST - Collect specimens and clearly mark specimens " URGENT: for SARI Screen " Collect the specimens when clinically indicated - Nasopharyngeal and oropharyngeal swab in viral transport media - CXR - CBC and differential - Endotracheal secretions, Bronchoalveolar lavage (BAL) - Serum for <i>Mycoplasma pneumoniae</i> and <i>Chlamydia pneumoniae</i> serology. - If patient has diarrhea, send stool for viral studies. - Arrange other testing as recommended by MHO and/or ID specialist (document on this form). - Local lab to contact RRPL and confirm details related to delivery/arrival for the STAT specimens. - Liver function tests - Blood culture - Sputum C & S			Done	Not Done