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December 17, 2003

Infection Control Precautions for Respiratory Infections Transmitted by Large Droplet and Contact

Infection Control Guidance in a Non-Outbreak Setting, (In the Absence of SARS) When an Individual Presents to a Health Care Institution¹ With a Respiratory Infection

The recommendations in this document have been developed under the guidance of the Health Canada Infection Control Guidelines Steering Committee. The initial draft of this document was written by the professional staff in Nosocomial and Occupational Infections based on the infection control guideline *Routine Practices and Additional Precautions for Preventing the Transmission of Infection in Health Care*. A consensus meeting of experts was held on November 24, 2003 to review the initial draft. The decisions from the consensus meeting were brought to Steering Committee which further developed the recommendations. Subsequent drafts have been vetted through various expert groups.

The respiratory infections of concern in this guidance document are definite or possible respiratory tract infections, including colds, pharyngitis, croup bronchiolitis, pneumonia, and confirmed infections with adenovirus, influenza, parainfluenza virus, respiratory syncytial virus, metapneumovirus, rhinovirus, or coronavirus.

For infections transmitted by airborne route refer to the infection control guideline *Routine Practices and Additional Precautions for Preventing the Transmission of Infection in Health Care*.

For information on SARS, refer to the website: www.sars.gc.ca. *Infection Control Guidance if there is a SARS Outbreak Anywhere in the World, When an Individual Presents to a Health Care Institution with a Respiratory Infection*.

¹Health care institutions include, but are not limited to, acute care hospitals, emergency departments, rehabilitation hospitals, mental health hospitals, and long term care facilities.

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The following recommendations have been developed to assist health care workers (HCWs) in preventing the transmission of respiratory infections. Refer to Appendix I for recommendations related to aerosol-generating respiratory procedures. Refer to Appendix II for reprocessing of respiratory equipment.

Definition:

Non-outbreak: Non-outbreak refers to the situation in which there is no outbreak of acute respiratory infection.

Screening

Questionnaire to be administered to all patients at first encounter to a health care institution:

- a. Emergency Department/EMS (Emergency Medical Services)
- b. Outpatient clinics

The HCW should maintain a distance of 1 metre from the patient while asking screening questions.

If the patient responds “yes” to the screening questions:

- the HCW should don a surgical mask and consider eye protection;
- the patient should don a surgical mask and perform hand hygiene;
- the patient should be moved to a separate area;
- persons accompanying the patient should don a surgical mask.

Screening Questions:

1. Do you have new or worsening cough or shortness of breath?
2. Have you had a fever or chills?
3. Have you been to China, Taiwan, Hong Kong within the last 14 days²?
4. Have you had contact with a sick person that has travelled to these areas in the last 14 days²?

On admission, repeat the above questions and ask this additional question:

5. Are you a Health Care Worker?

Notify infection control if the response to screening questions 3, 4 or 5 is positive.

²At this time, there is no evidence to support the utility of restricted access and active screening in limiting the transmission of SARS.

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- A risk assessment should be done for all patients and procedures.
- Each institution should have its own algorithm for screening, admitting and managing patients who may have a respiratory infection.
- Signage should be posted outside triage area with self-screening questions as stated above.
- Hand hygiene stations and surgical masks should be placed at the entrances to emergency and outpatient departments.
- Screening procedures may differ for facilities or programs depending on the population (e.g., pediatric or adult, transplant), and may vary seasonally (fall/winter vs spring/summer).
- Long term care facilities should ask screening questions and document the responses with transfer information when transferring a resident to another facility/agency.
- Ambulance dispatch should ask the caller the screening questions and notify EMS. EMS should ask the patient the screening questions and, if indicated, take a temperature reading prior to transporting patients.

Triage

- If the patient has not self-screened, the triage staff should immediately ask the patient about fever and respiratory symptoms (Questions 1 and 2).
- If the patient has screened positive for Questions 1 and 2, the patient should be given a surgical mask to wear or tissues to use if a mask cannot be worn. The patient should be interviewed immediately to determine: the travel history (Question 3) and contact with a traveller with respiratory symptoms (Question 4). They should also be asked if they have worked in, visited, or been admitted to an acute care hospital in the previous 14 days.
- Triage staff should know the symptoms to screen for and specific infection control precautions required.
- Triage staff should have hand hygiene stations readily available.
- Triage staff should have the recommended personal protective equipment (i.e., surgical mask and eye protection) readily available to use if the patient responds yes to screening questions 1 and 2.

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- Triage staff should follow the required infection control precautions, including the recommended PPE.
- Until the possibility of a respiratory infection is ruled out, staff should maintain 1 metre separation if not wearing recommended personal protective equipment (PPE).
- Triage staff should consider the following infection control issues for a patient with a potential respiratory infection:
 - What additional precautions (beyond routine practices) may be required?
 - Is patient segregation required in the emergency room or in the outpatient clinic?
 - Are a surgical mask and hand hygiene required of the patient?
 - What precautions are required for the person(s) accompanying the patient?
- Local public health should be informed according to protocol developed by public health and hospital administration.

Triage Waiting Location

- Patients with respiratory infections should be segregated from others, or wait in a separate area, if available, away from the general population.

Precautions for Triage and Patient Care

1. Hand Hygiene

Hand hygiene is the most important measure in preventing the spread of infection.

- HCWs should avoid touching their face and mucous membranes (including eyes) with their hands.
- Hand hygiene should be performed:
 - before direct contact with a patient
 - after any direct contact with a patient and before contact with the next patient
 - before performing invasive procedures
 - after contact with blood, body fluids, secretions and excretions

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- after contact with items known or considered likely to be contaminated with blood, body fluids, secretions and excretions, including respiratory secretions (e.g., oxygen tubing, masks, used tissues and other items handled by the patient)
- immediately after removing gloves and other protective equipment
- between certain procedures on the same patient where soiling of hands is likely, to avoid cross-contamination of body sites
- before preparing, handling, serving or eating food and before feeding a patient.
- Waterless antiseptic hand rinses are effective for hand hygiene and should be readily available. If there is visible soiling, hands must be washed with soap and water before using waterless antiseptic hand rinses. If soap and water are unavailable, cleanse hands first with detergent-containing towelettes to remove visible soil.
- Ideally, HCWs should not wash their hands in patient washrooms. If a patient washroom is used, care must be taken to avoid hand contamination from the environment after hand washing.
- Patients, care givers and visitors should be instructed in proper hand hygiene.

2. Gloves

- Gloves should be used as an additional measure, not as a substitute for hand hygiene.
- Gloves should be put on before entering, and prior to leaving, the patient's room or dedicated bed space.
- Medical quality gloves of adequate size for wearer should be worn to prevent transmission by contact of microorganisms.
- Gloves should be changed between care activities and procedures with the same patient after contact with materials that may contain high concentrations of microorganisms, e.g., after open suctioning of an endotracheal tube.
- Hand hygiene should be performed immediately after removing gloves.
- When a gown is worn, the gloves should cover the sleeve cuffs.
- Single-use gloves should not be reused or washed.

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3. Masks

- Whenever the term mask is used in this document, the term refers to **surgical masks**. The **only** exception is the recommendation for sputum induction procedures (see Appendix I),
- The need for masks during routine patient care depends on the task performed, i.e. whether it involves activities that are likely to generate splashes or sprays of blood, body fluids, secretions or excretions.
- Masks should be worn when within 1 metre of a coughing adult or pediatric patient.
- For care of an adult patient with respiratory illness, put a surgical mask on the patient, if tolerated, whenever patient is not in his/her room.
- Masks should be removed carefully using the straps so as not to self-contaminate.
- Masks should be changed according to the manufacturer's recommendations.
- Discard a mask that is crushed, wet, or has become contaminated by patient secretions.
- HCWs should perform hand hygiene after removal of mask.

4. Eye Protection

- Eye protection (safety glasses, goggles or face shields) should be worn where there is a potential for splattering or spraying of blood, body fluids, secretions or excretions, including cough producing and aerosol-generating procedures, when providing direct patient care.
- Use of eye protection, especially for the care of pediatric patients, needs to be considered with certain organisms transmitted by large droplets, e.g., respiratory syncytial virus (RSV), adenovirus. In pediatric institutions, eye protection by face shields or goggles plus masks, has been shown to prevent RSV infections in HCWs.
- Eye protection should protect the eyes from splashes.
- Prescription eye glasses do not provide adequate protection against splashes and sprays.
- Choose eye protection that does not impair the HCW's vision and thereby interfere with patient care.

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- Safety glasses, goggles and face shields should be removed carefully to prevent self-contamination.
- If re-used, the eye protection should be cleaned in a manner that will not contaminate the HCW. The safety glasses, goggles, or face shields should be cleaned between use according to the manufacturer's recommendations using low level disinfection at a minimum.
- To prevent self-contamination, HCWs should not touch their eyes during care of a patient with a respiratory infection.
- HCWs should perform hand hygiene after removing eye protection.

5. Gowns

- Long-sleeved gowns should be worn to protect the forearms and clothing of the HCW from splashing and soiling with body substances during procedures and patient care activities likely to generate splashes or sprays of blood, body fluids, secretions, or excretions.
- Gowns should be removed before leaving the patient's room.

6. Patient Accommodation

- Generally, single rooms are not required for routine adult patient care.
- Use of single rooms may facilitate application of additional precautions when indicated.
- Establish a hierarchy of preferred accommodation that is operational in any facility so that resources are not diverted unnecessarily. For patients with non airborne transmitted respiratory infections in the absence of SARS, the following priorities can be applied to patient accommodation:
 - i. Single room
 - Door may remain open
 - Single room should have toilet and hand washing facilities.
 - For newborn nurseries, a single room is not necessary if there is a 1-2 metre aisle between infant stations.

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ii. Cohort

- Patients known to be infected with the same organism (identified by culture or rapid antigen test) may be grouped together unless acquisition of different strains of the microorganism is a concern. Assignment of patients known to be infected with the same organism to the same room, or grouping (cohorting), of infected and noninfected patients in separate wards or areas has been successful in controlling transmission of some infections.

iii. Shared room

- Maintain spatial separation of at least 1 metre between the infected patient and other patients and their visitors. Keep privacy curtains closed.

- Room-mates and all visitors should be aware of infection control precautions to follow.

- Selection of room-mates:

- Room-mates and their visitors should be capable of complying with infection control precautions.
- Room-mates should not be at high risk of complications should they acquire the infection.
- Single room indicated if above conditions are not achievable.

7. Patient Transport Within the Facility

- Patients with a respiratory infection should only be out of their rooms for essential procedures.
- If it is necessary to move patients who require infection control precautions, the transport route should be expedient and avoid well populated areas if possible.
- Transport personnel should wear gloves, and remove the gloves immediately on completion of transport.
- Patients should wear a surgical mask during transport.
- If unable to keep mask on a child, use tissues to cover the child's nose and mouth. An incubator can be used for infant transport.
- Personnel in the area to which the patient is to be transported should receive prior notification and be aware of the infection control precautions to follow.

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- Transport personnel should take precautions to minimize direct contact between the patient, and other patients and environmental surfaces and objects.

8. Patient Transfer Between Institutions

- Transport services should have existing policies and procedures for transporting patients with respiratory infections.
- The transferring institution should advise the personnel transporting the patient of infection control precautions required during transport.
- The receiving agency should be notified and be aware of the infection control precautions to follow, including recommended PPE.

9. Air Evacuation of Patients With Respiratory Infections

Will be deferred to a future working group.

10. Patient Care Equipment (Refer to the infection control guideline *Hand Washing, Cleaning, Disinfection and Sterilization in Health Care*. See web address on last page)

- Ensure that staff are trained and follow the recommendations for cleaning, disinfecting and sterilizing patient care equipment in *Infection Control Guideline Hand Washing, Cleaning, Disinfection and Sterilization in Health Care*.
- Procedures should be established for assigning responsibility and accountability for routine cleaning of all patient care equipment.
- Disposable equipment should be used whenever possible.
- Mouthpieces, resuscitation bags, or other ventilation devices should be provided for use in hospital areas where the need to resuscitate is likely to occur.
- Refer to Appendix II for disinfection and sterilization of respiratory equipment.
- Equipment that is visibly soiled should be cleaned promptly with soap and water, detergents or enzymatic agents.
- Soiled patient care equipment should be handled in a manner that prevents exposure of skin and mucous membranes and contamination of clothing or the environment.
- Equipment should be cleaned and disinfected prior to being used with other patients. The

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reprocessing method required for a specific item depends on the item's intended use, the risk of infection to the patient, and the amount of soiling.

11. **Environmental Control** (Refer to the infection control guideline *Hand Washing, Cleaning, Disinfection and Sterilization in Health Care.*)

- Procedures should be established for assigning responsibility and accountability for routine cleaning of all environmental surfaces including furniture (e.g., bed rails and over bed table) and noncritical patient care items (e.g., call bell).
- Personnel who are assigned this responsibility should be trained and supervised in cleaning and disinfection methods.
- Frequent cleaning of environmental surfaces and noncritical patient care items using hospital grade detergent-disinfectant is recommended.
- Sufficient quantity of detergent-disinfectant in the correct concentration applied with a clean cloth are components of an effective cleaning process. Comply with contact time on manufacturer's label and workplace safety requirements.
- All horizontal and frequently touched surfaces should be cleaned daily and more often when soiled.
- Routine practices should be applied in the handling of soiled linen.
- Routine practices should be applied to handling clinical waste. Double bagging of waste is not required.

12. **Visitors**

- Visitors should talk with a staff member before entering the room and, if indicated, should be instructed in the appropriate use of a surgical mask and other precautions.
- The number of visitors should be kept to a minimum.
- For infections transmitted by large droplets, surgical masks should be worn by all visitors coming within 1 metre of the patient.
- Masks are not mandatory for parents visiting a pediatric patient.
- HCWs should advise visitors of the need to adhere to hand hygiene, and ensure convenient

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access to hand hygiene facilities.

13. Patient and Family Education

- Patients and family members should have the nature of the illness and the reason for the infection control precautions explained to them.

14. HCW Education

- HCW should be able to apply routine practices and additional precautions in the clinical setting.
- HCW should be trained to don and doff PPE, perform hand hygiene, etc.
- HCW should know the epidemiology and symptoms of the respiratory diseases requiring infection control precautions.
- HCWs should know that they should not go to work if they have a febrile respiratory illness.

15. Postmortem Care

- Routine practices should be followed during postmortem procedures.

Infection Control Guidelines: Hand Washing, Cleaning, Disinfection and Sterilization in Health Care

<http://www.hc-sc.gc.ca/pphb-dgspsp/publicat/ccdr-rmtc/98pdf/cdr24s8e.pdf>

Infection Control Guidelines: Routine Practices and Additional Precautions for Preventing the Transmission of Infection in Health Care

<http://www.hc-sc.gc.ca/pphb-dgspsp/publicat/ccdr-rmtc/99vol25/25s4/index.html>

Guidelines for Preventing the Transmission of Tuberculosis in Canadian Health Care Facilities and Other Institutional Settings

<http://www.hc-sc.gc.ca/pphb-dgspsp/publicat/ccdr-rmtc/96vol22/22s1/index.html>

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APPENDIX I: **Aerosol Generating Respiratory Procedures**

Infection Control Guidance in a Non-Outbreak Situation, Where an Individual Presents With a Febrile Respiratory Infection

The following infection control guidance sheet has been developed to assist health care workers (HCWs) in preventing the transmission of respiratory infections during high risk procedures.

Definition

Aerosol Generating Respiratory Procedure: a procedure with the potential to generate a high volume of respiratory droplets and the procedure may propel these droplets over a wide radius (> 1 metre). Although all aerosol generating procedures used in the provision of health care involve risk, some present a greater infection control risk than others.

1. A risk assessment should be performed prior to any aerosol generating respiratory procedure to determine the need for administrative controls, environmental controls and personal protective equipment (e.g., surgical mask for HCW if within 1 metre of coughing patient).
2. Uncontrolled intubation procedures can be avoided in most, if not all cases if administrative controls (see point # 3 below) are established and regularly reviewed with all HCWs.
3. The following controls are recommended when performing aerosol generating procedures on patients with respiratory infections:
 - a) Predetermined administrative controls (e.g. signage, keeping the number of people in the room to a minimum, procedures such as sedating the patient which will limit the duration of the intubation, ensuring that there is adequate equipment in the room)
 - b) Engineering controls (e.g. route of air flow, air exchanges) and
 - c) Environmental controls (e.g., staff performing the procedure should ensure that contaminated equipment and surfaces are discarded or cleaned/disinfected before leaving the room).
4. Whenever possible, ensure that aerosol generating respiratory procedures are conducted in a controlled setting. This requires early recognition of patients who may require high risk interventions (e.g., intubation, bronchoscopy) in order to avoid emergency procedures.
5. The stimulation of coughing and aerosol-generating procedures on patients with suspect or probable acute respiratory infections should be limited to those deemed medically

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necessary.

6. Whenever possible, alternative methods for delivery of medication should be used instead of nebulizers (e.g., metered dose inhalers).
7. Sputum induction procedures pose a very high infection control risk. This procedure should be performed using airborne precautions including a negative pressure room with regulated air exchanges, personnel wearing N 95 (or equivalent) respirators, etc.
8. In the absence of SARS activity or the suspicion of an airborne infection, it is **not necessary** for aerosol-generating procedures to be performed in a room with negative pressure relative to the surrounding area.
9. Whenever possible, high risk aerosol generating procedures (see above table) should be performed in a private room. Consideration must be given to the infection transmission risk for the other patients in the patient care area. If a private room is not available, a > 1 metre separation with privacy curtains should be used.
10. For all aerosol generating procedures, all personnel in the room should have recommended personal protective equipment: a fluid resistant surgical mask, eye protection and gloves. Eye protection should protect the eyes from splashes from all directions. Gloves are not necessary for personnel who are only observing the procedure.
11. Health Canada does not recommend the use of enhanced respiratory personal protective equipment (PPE) such as the powered air purified respirator system (PAPRS) during high risk procedures involving airway interventions including endotracheal intubation and extubation. Additionally, enhanced PPE and the increased complexity involved in the removal and disposal/cleaning/ decontamination of this equipment, may increase the potential risk of self contamination.
12. Respiratory equipment should be cleaned and disinfected according to manufacturer's recommendations for the device, and Appendix II Reprocessing of Respiratory Equipment.

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APPENDIX II

Infection Control Guidance for Reprocessing of Respiratory Equipment and Devices

The following fact sheet has been developed to assist with the reprocessing of respiratory equipment and devices according to infection risk categories (Spaulding Classification). Manufacturer’s instructions for the reprocessing of every medical device must be followed. For the methods to achieve the level of disinfection or sterilization required for medical devices, refer to *Health Canada Infection Control Guidelines Hand Washing, Cleaning, Disinfection and Sterilization in Health Care*. <http://www.hc-sc.gc.ca/pphb-dgspsp/publicat/ccdr-rmtc/98pdf/cdr24s8e.pdf>

Sterilization and Disinfection of Respiratory Equipment and Devices According to Infection Risk Categories (Spaulding Classification)

Category	Description	Device	Processing
Critical	Devices that enter the blood stream or sterile tissue	Bronchoscope biopsy forceps and specimen brushes	Sterilization
Semicritical	Devices that directly or indirectly contact mucus membranes including devices through which air or other gases flow for delivery to the lower respiratory tract	Bronchoscopes and accessories Oral, nasal and tracheal airways Ventilator breathing circuits Bubbling or wick humidifiers Exhalation valves Small volume medication nebulizers Large volume nebulizers in ventilators PFT mouthpieces, tubing, connectors Resuscitation bags Laryngoscope blades Stylets Air-pressure monitor probes CO2 and O2 analyzer probes used within respiratory circuits or devices Temperature probes used within respirator circuits or devices Respirometers Suction catheters Anesthesia devices or equipment: <ul style="list-style-type: none"> • face masks or tracheal tubes • inspiratory and expiratory tubings • Y connectors • right angle connectors • reservoir bags • humidifier and tubing 	High-level disinfection
Noncritical	Devices that touch only intact skin but not the mucous membranes or do not contact the patient	Exterior surface of ventilator Trancutaneous oxygen monitor probes	Low/intermediate level disinfection