Ministry of Health
and Long-Term Care

Ontario

SARS Provincial Operations Centre

Directive 03-06(R)
May 13, 2003

DIRECTIVES TO ALL ONTARIO ACUTE CARE HOSPITALS FOR HIGH-RISK PROCEDURES INVOLVING SARS PATIENTS CRITICAL CARE AREAS

This Directive replaces the following:

> *Directives to all Ontario Acute Care Hospitals for High-Risk Procedures in Critical Care Areas During a SARS Outbreak, May 1, 2003*

In order to contain the spread of SARS (severe acute respiratory syndrome), the Ontario Ministry of Health and Long-Term Care directs all acute care hospitals to undertake the following procedures:

High-risk procedures should be avoided whenever possible. However, in situations where such procedures are unavoidable (e.g., intubation of a SARS patient in respiratory distress), staff should follow the additional level of staff precautions outlined in this document for these high-risk procedures.

All staff working in SARS units or with SARS patients must follow the *Directives for Acute Care Hospitals Regarding Infection Control Measures for SARS Units*, Version 03-05(R), April 24, 2003.

Principles:

- High-risk procedures performed on SARS patients expose staff to a high viral burden and must be avoided as much as possible.
- High-risk procedures should be performed:
  - in a private room with negative pressure,
  - by the most experienced staff,
  - with minimum numbers of staff, and
  - with strict adherence to SARS precautions and hand disinfection.

- ICUs must have access to an infection control consultant to assist with the review of practices.

SPECIFIC DIRECTIVES FOR:

A. ALL PATIENTS REQUIRING SARS PRECAUTIONS

Protection/Equipment

- For emergency endotracheal intubation of **non-SARS** patients, ensure that each patient unit has:
  - a manual resuscitation bag with bacterial/viral filter,
  - in-line suction catheters,
  - intubation equipment, and
  - full protective apparel for the individual performing the intubation, and for the respiratory therapist. This includes gowns, gloves, full-face shields with N95 masks or equivalent. Personal protective equipment must be properly used and maintained consistent with the *Occupational Health and Safety Act* Reg. 67/93 s.10. N95 or equivalent masks must be qualitatively fit tested to ensure maximum effectiveness. (See NIOSH website at www.cdc.gov/niosh - Publication No.99-143).
- Protective apparel must be removed carefully at the end of the procedure to reduce the risk of contamination and re-aerosolization of droplets.

Procedures

- Nebulized therapies should be avoided. Ventolin® or atrovent® can be delivered using the metered dose inhaler and aerochamber.
- The need for chest physiotherapy should be carefully assessed; recognizing that cough-inducing procedures may increase the risk of transmission.
- Oxygen should be delivered DRY avoiding nebulized humidity. Maximum flow rate for nasal prongs should be 6 litres per minute.
- If a patient requires up to 50% oxygen by mask use a venti-mask. If a patient requires more than 50% oxygen then the respiratory therapist (RT) should be notified. The nebulizer system shall be emptied of the water from the prefilled water bottle. The water bottle should remain DRY. The RT will monitor the patient and wean to nasal prongs as soon as the patient can tolerate.
- Patients should receive frequent mouth care.
- Patients with tracheostomies should be provided with humidity.
- Patients who require oxygen greater than 50% should be referred to RT for set up and ongoing monitoring.
- High frequency oscillation and non-invasive ventilation (CPAP/BiPAP) should be avoided. If ventilation is essential for the patient, the patient should be screened in consultation with infectious diseases/infection control staff, to ensure that a diagnosis of SARS has been ruled out. The procedure should be performed in a

private room.

B. SARS PATIENTS IN CRITICAL CARE AREAS

1. Bronchoscopy should be avoided if possible in patients known or suspected to have SARS.

2. Equipment:

- In the ICUs and SARS units and other high risk areas identified by the hospital, include with the arrest cart (crash cart):
    - manual resuscitation bag with bacterial/viral filter,
    - in-line suction catheters, and
    - personal protection system (PPS) – an apparatus consisting of head, face and neck protection with or without enclosed body protection.

3. Intubation and bronchoscopy:

Personal Protection:

- Those performing the intubation should wear full head, face and neck protection. This may consist of positive airway pressure respirator (PAPR) or another type of PPS (see Appendix A - Parameters to Guide the Selection of Personal Protective Systems).
- The system chosen should allow for safe performance of the procedure and not fog when in use.
- Staff must be trained in the use of the specific type of PPS chosen.

Use of the Positive Airway Pressure Respirators and Personal Protection Systems:

- An N95 mask or equivalent should be worn underneath the respirator and be left in place once the respirator hood is removed until staff have left the room.
- Staff using this equipment must receive proper instruction on the application and removal to avoid contamination.
- A practice session should be carried out prior to use and written instructions should be given to staff. Staff training sessions must be documented. The hospital Infection Control Practitioner must review the written procedure/ instructions.
- Ensure that all disposable components of the equipment are carefully removed at the end of the procedure and reusable items are thoroughly cleaned using hospital disinfectant or disinfectant wipes.
- The application and removal of PAPR/PPS equipment requires the assistance of another person and should not be done alone.

Personnel:

- The procedure should be performed by the most experienced staff members available. The number of persons in the room should be kept to a maximum of 2-3 persons (note: hospitals may wish to consider a SARS intubation team).

Procedure:

- The procedure should be done in a negative pressure room. If none are available, the procedure must be done in a private room with the door closed.
- After hand-washing and prior to entering the room, the code team must apply the personal protective equipment as per Directive Version 03-05 (R), April 24, 2003 and manufacturer's instructions.
- Staff in the room during the intubation must apply the personal protection system (PPS).
- The intubation must be done while the patient is sedated and paralysed if medical condition permits.
- The ventilator and in-line suction device should be in the patient room to reduce time needed for bag ventilation and disconnecting bag from the endotracheal tube suctioning.
- Remove protective equipment following Directive Version 03-05 (R), April 24, 2003 and manufacturer's instructions after intubation.
- Minimize re-entry to the room by staff for approximately 2 hours post procedure.
- Critical care areas should preassemble medication/equipment for intubations performed in a SARS patient room. The preassembled kit must be in a disposable or easily cleaned container.

Cleaning:

- Excess medications must be discarded at the end of the procedure.
- Immediate clean up of room and equipment must be done in such a way as to reduce the re-release of aerosols.
- Staff performing the procedure must ensure that contaminated equipment and surfaces are discarded/disinfected and cleaned before leaving the room.
- Potentially contaminated surfaces in the room must be wiped with a hospital-approved disinfectant.

4. Management of SARS patients with mechanical ventilation:

Note: Infectious respiratory secretions from SARS patients will contaminate respiratory equipment and be expelled into the surrounding environment.

Procedure:

- Ventilators
    - A hydrophobic submicron filter must be placed between the endotracheal tube and the ventilator circuit tubing.
    - If possible, ventilators with built in bacterial/viral filters in the expiratory circuit should be used. If this is not possible, such a

filter must be placed in the expiratory circuit of the ventilator. Filters must be changed when fluid build-up impedes ventilation.

- Disposal of filters should be considered a high-risk exposure and staff must protect themselves using full personal protective equipment following the maximal precautions policy.
- Filters and respiratory circuits for known SARS cases must be single use and disposed of after use.
- Filters must be bagged, sealed, and then placed in a biohazardous bag for disposal.
- Heated wire circuits must be used on both the inspiratory and expiratory sides of the circuit.
- A water trap/filter combination must be placed at the end of the expiratory circuit.

- Manual Resuscitation Bags:
  - A hydrophobic submicron filter must be placed between the endotracheal tube and the bag.
  - Filters must be changed when fluid build-up impedes ventilation (at least every 24 hours).
  - Disposal of filters must be considered a high-risk exposure and staff must protect themselves following maximum precautions using full SARS protective equipment.
  - Filters must be bagged, sealed, and then placed in a biohazardous bag for disposal.
  - Equipment used for manual bagging must be disposed of after use, not cleaned.

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Appendix A

Parameters to Guide the Selection of Personal Protective Systems

1. Provides barrier precautions for droplets/splashing and completely covers all of the face and head, or can be easily combined with other protective apparel to provide full coverage.

2. Provides filtration at <0.3 micron with 95% filter efficiency. For hooded devices, the circulating air within the hood should not affect the wearing of a N95 mask or equivalent nor impede its effectiveness.

3. Hooded devices should be able to create positive pressure.

4. Consideration should be given to the extent of CO_2 build up within hood or respirator. Current guidelines recommend that CO_2 should not exceed 5000 ppm as a time weighted average (TWA).

5. Where applicable, the system should be able to provide full fit testing, similar to N95 masks.

6. The equipment should be able to be assembled with little chance of error, and disassembled easily.

7. Ability to clean the surface of the equipment with hospital grade disinfectants. Single use of high-risk components is preferred, or the product is easily disassembled and cleaned and tolerates high-level disinfection or sterilization.

8. The filter for any system should be easy to remove and dispose.

9. Demonstrable ease of donning with minimal amount of time.

10. Ability to remove equipment with minimal contamination of the wearer and the equipment.

11. The device provides a good field of vision, and a clear view with no distortion in order to perform procedures such as intubation and bronchoscopy.

12. The device should not interfere with communications between team members and allow for clinical assessments of patients such as auscultation.

13. Wearer is able to easily perform procedures based on ergonomic factors.

14. The system or device should be comfortable to wear for at least a continuous 2-hour period.

15. The equipment should be easily worn and managed by staff of varying sizes.

16. The equipment or device should allow for the wearer to remain cool and comfortable.

Examples of Personal Protective Systems:

- 3M PAPR Hood
- Stryker T4 System
- Full face respirators

A listing of powered air-purifying respirators can be found by doing the following two steps:
http://www2.cdc.gov/drds/cel/cel/_form.asp

Highlight "HEPA (PAPR only)" in the section with the heading "For Protection Against:"
Click on "View Results" at the bottom of the page on the screen.