



HEALTH HOLDING

HAFER ALBATIN HEALTH  
CLUSTER  
MATERNITY AND  
CHILDREN HOSPITAL

<b>Department:</b>	Infection Prevention and Control Department		
<b>Document:</b>	Departmental Policy and Procedure (DPP)		
<b>Title:</b>	Respiratory Therapy IPC Guidelines		
<b>Applies To:</b>	Respiratory Therapist		
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## 1. PURPOSE:

- 1.1 To describe Infection Control standards for respiratory therapy services and to avoid any improper handling of respiratory care equipment that may lead to increased incidence of healthcare-associated infections.

## 2. DEFINITONS:

- 2.1 Respiratory Therapy Unit - provide diagnostic and therapeutic services to monitor and support the function of respiratory system. The activities include pulmonary function studies, administration of oxygen and medication, ventilator support and chest physiotherapy (Part of code blue team).

## 3. POLICY:

- 3.1 Certain interventions used by the Respiratory Care Service may influence infection risks to patients and HCWs.
- 3.2 Mechanical ventilation, ventilator circuit channels, handling of condensate, use of nebulizers, suction catheters and humidification methods are potential infection risks
- 3.3 Routes of transmission of pathogens most commonly associated with respiratory care are airborne, droplet nuclei and direct contact with contaminated fluids such as secretions, saliva, sputum, blood, or condensate in aerosol tubing or a ventilator circuit.
- 3.4 Transmission of pathogens in fluid occurs when the fluid physically moves, flows, or spills from one area to another.
- 3.5 Direct contact with hands or equipment is thought to be a common mode of transmission.
- 3.6 Routes of transmission may be from practitioner or device to patient, from one patient to another, or from one body site to the lower respiratory tract of the same patient, via the hands or a device.
- 3.7 Nebulizers with reservoirs can allow for the growth of hydrophilic bacteria that can be nebulized to the patient during device use.
- 3.8 Gram-negative bacilli such as *Pseudomonas* spp., *Stenotrophomonas* spp., *Flavobacterium* spp., *Legionella* spp., and non-tuberculosis mycobacteria can multiply to substantial concentrations in nebulizer fluid and increase the risk of acquiring pneumonia.
- 3.9 Sterilization or high-level disinfection can eliminate vegetative bacteria from device reservoirs, making the reservoirs safe for patient use.
- 3.10 Improved VAP incidence has been reported when using a closed-suction versus an open-suction system. Elimination of routine closed-system suction catheter changes increases safety and reduces the costs of mechanical ventilation.

## 4. PROCEDURE:

- 4.1 Standard precautions  
4.1.1 Use standard precautions for all patient care

- 4.1.2 Use personal protective equipment (PPE) singly or in combination for any or all of the following procedures as indicated:
  - 4.1.2.1 Wear gloves for handling respiratory secretions and objects contaminated with the respiratory secretions of any patient.
  - 4.1.2.2 Wear face protection (mask and goggles) when contamination of the face with aerosolized particles is likely.
  - 4.1.2.3 Wear an N95 particulate mask or a power air purifying respirator (PAPR) when managing patients with suspected or confirmed pulmonary tuberculosis.
  - 4.1.2.4 Wear PPE when contact with the respiratory secretions from a patient is likely
    - 4.1.2.4.1 Change the PPE after such contact and before providing care to another patient.
  - 4.1.2.5 Follow the required isolation precautions when entering the rooms of patients in isolation.
  - 4.1.2.6 Respiratory equipment (e.g., ventilator, monitors, etc.) in use should be cleaned regularly (when visibly soiled, daily, and when patient is discharged) to reduce environmental contamination.
  - 4.1.2.7 All reusable respiratory items requiring disinfection and sterilization must be sent to the Central Sterile Supply Department (CSSD).
- 4.2 Hand hygiene
  - 4.2.1 Wash or cleanse hands and dry them thoroughly before and after all contacts with the patient and the patient's environment.
  - 4.2.2 Wash and dry or cleanse hands before and after glove use.
- 4.3 Mechanical ventilation and humidifiers
  - 4.3.1 Use high-efficiency bacterial filters in the breathing circuit of the ventilation unit.
  - 4.3.2 Ensure that the patient is positioned with his/her head elevated at a 30° to 45° angle, except during postural drainage procedures, to minimize aspiration of secretions.
  - 4.3.3 Use filters on the inspiratory limb to eliminate contaminants from entering the inspired gas and contaminating the ventilator.
  - 4.3.4 Place bacterial filters appropriately to avoid any potential interference with the operating characteristics of the ventilator by impeding high gas flow.
  - 4.3.5 Carefully test reusable filters periodically to ensure efficient functioning. These filters must be reprocessed by CSSD.
  - 4.3.6 Use closed continuous-feed humidification on all ventilator circuits to minimize/prevent aerosols, thus preventing the transmission of bacteria from the humidifier reservoir to patients.
  - 4.3.7 Use sterile water to fill humidifiers. Heated humidification systems often operate at temperatures that reduce or eliminate bacterial pathogens. Tap or distilled water may harbor Legionella spp. that is more heat-resistant than other bacteria.
  - 4.3.8 Sterilization or high-level disinfection of reusable circuits, humidifiers and nebulizers between patients is recommended.
  - 4.3.9 Disinfect in-line temperature sensors properly according to the manufacturer.
  - 4.3.10 The ventilator circuit, including the ventilator tubing and filter, exhalation valve and humidifier, should be changed when visibly soiled or mechanically malfunctioning.
    - 4.3.10.1 No maximum time between changes has been recommended for use of ventilator circuits with non-aerosol-generating humidifiers.
    - 4.3.10.2 Circuits should not be routinely changed for infection control purposes. Increased VAP infection rates are associated with 48-hour circuit changes.
    - 4.3.10.3 HMEs should be changed if there is gross contamination or mechanical malfunction.
- 4.4 Artificial Airways
  - 4.4.1 Elevate the patient head's between 30° and 45°, during the use of artificial airways, especially during feedings and for one hour following feedings, when not contraindicated.

- 4.4.2 Do not routinely deflate the cuff of the endotracheal tube to determine the filling volume of the cuff. Alternative techniques to assure proper cuff pressure (such as minimal leak or minimal occluding pressure) should be used.
- 4.4.3 Ensure proper cuff pressure with minimal leak or minimal occluding pressure.
- 4.4.4 Perform a tracheostomy when indicated using sterile technique. Elective tracheostomy should be performed in the operating room.
- 4.4.5 Use aseptic technique to change the airway tube
- 4.4.6 Replace the tube with one that has undergone sterilization or high-level disinfection.
- 4.5 Condensate
  - 4.5.1 Drain and discard any condensate that collects in the tubing of the ventilator to prevent it from draining toward the patient.
  - 4.5.2 Use water traps to minimize spillage
  - 4.5.3 Place traps appropriately in the ventilator circuits so as to allow gravity to drain condensate continuously away from the patient
  - 4.5.4 Treat contaminated condensate as waste and properly dispose of it through the standard hospital waste system.
  - 4.5.5 Use heated wire circuits to reduce/eliminate condensate formation in the ventilator circuit.
  - 4.5.6 Set heated wire circuits so that a small amount of condensate forms on the inspiratory limb of the circuit, indicating 100% relative humidity.
  - 4.5.7 Adjust the heated wire circuit properly to deliver the appropriate humidity to the patient.
    - N.B: Heat and moisture exchanger (HME) can increase dead space and resistance to breathing and, at the same time, provide less humidity than the active systems previously discussed, resulting in thick and obstructive secretions in some patients. To be effective, >70% of the gas entering the airway must be exhaled through the HME. Place HME between the ventilator circuit and the patient's airway.
    - 4.5.7.1 If the humidity is decreased, it will result in damage to the epithelium of the respiratory tract, with potential occlusion of artificial airways, especially in infants and small children.
    - 4.5.7.2 There is no CDC recommendation for preferential use of HME rather than heated humidifiers to prevent healthcare-associated pneumonia.
    - 4.5.7.3 The HME should be changed when grossly contaminated or mechanically malfunctioning.
    - 4.5.7.4 Vent circuits should not routinely be changed when using an HME.
- 4.6 Nebulizers
  - 4.6.1 Large-volume nebulizers and mist tents: Room humidifiers that create aerosols have been associated with nosocomial pneumonia secondary to contamination of their reservoirs. The CDC recommends that aerosol-generating room humidifiers not be used unless they can be filled only with sterile fluids and be sterilized or undergo high-level disinfection every 24 hours.
    - 4.6.1.1 Reusable large-volume nebulizers, mist tents, and hoods should be subject to sterilization or high-level disinfection between patients and after every 24 hours of use on the same patient.
    - 4.6.1.2 Change disposable large-volume nebulizers every 72 hrs
  - 4.6.2 Small-volume medication nebulizers - handheld and inline:
    - 4.6.2.1 Use only sterile fluids that are dispensed aseptically.
    - 4.6.2.2 Disinfect or sterilize nebulizers between patients.
    - 4.6.2.3 Single-dose vials are preferred over multi-dose vials.
    - 4.6.2.4 Disinfect and rinse nebulizers with sterile water and air dry after each treatment on the same patient.
    - 4.6.2.5 Aseptically remove inline nebulizers from the ventilator circuit and disinfect or rinse nebulizers with sterile water, air drying between treatments
- 4.7 Suction Catheters

- 4.7.1 Use standard precautions, including eye and face protection during aerosol-generating procedures, should be taken with all patient care activities.
- 4.7.2 Open suctioning systems require:
  - 4.7.2.1 The use of a sterile catheter, sterile disposable gloves, and sterile normal saline if instillation is desirable.
  - 4.7.2.2 Personal protective equipment when contact with respiratory secretions is anticipated.
- 4.7.3 Closed suctioning systems may offer better control of lung volume and lead to fewer arrhythmias and desaturation episodes at the expense of increased tracheal colonization.
  - 4.7.3.1 Use only sterile fluid to remove secretions from the suction catheter.
  - 4.7.3.2 Change inline suction catheters no less frequently than every 72 hours.
- 4.7.4 Change the suction collection tubing and canisters between patients.
- 4.8 Medication (including multi-dose vials (MDVs))
  - 4.8.1 Medication intended for internal or external use should be labeled accordingly and stored separately
  - 4.8.2 Date, time, and initial all MDVs once opened or reconstituted.
  - 4.8.3 Refrigerate any opened MDV as recommended by the manufacturer
  - 4.8.4 Clean the rubber diaphragm of the MDV with 70% isopropyl alcohol before inserting a device into the vial.
  - 4.8.5 Access the MDV with a sterile device each time.
  - 4.8.6 Avoid touch contamination of the MDV
  - 4.8.7 MDVs should be accessed with a sterile needle each time, and the needle should be removed upon completion. The needle should not be left as a means of permanent access because it will provide a point of entry for microorganisms.
- 4.9 Specimen Collection
  - 4.9.1 Sputum/tracheal aspiration/bronchoscopy
    - 4.9.1.1 The patient should clean his/her teeth, gargle, and rinse his/her mouth with water just prior to collection.
    - 4.9.1.2 The best specimen is an early morning collection. Refer to hospital microbiology laboratory policies.
    - 4.9.1.3 For tracheal aspiration, follow the nursing procedure guidelines that pertain to patient preparation and specimen collection
    - 4.9.1.4 Wear appropriate PPE
    - 4.9.1.5 Perform sputum inductions in a private room with 6 air exchanges per hour if possible.
    - 4.9.1.6 Keep the door closed during the procedure.
    - 4.9.1.7 Ask the patient's visitors to leave the room during sputum induction.
  - 4.9.2 Percutaneous blood gases
    - 4.9.2.1 Perform hand hygiene and use gloves.
    - 4.9.2.2 Perform adequate skin preparation on the patient with hospital-approved antiseptic.
    - 4.9.2.3 Use sterile supplies
    - 4.9.2.4 Do not precool syringes by submerging them in ice water
    - 4.9.2.5 Avoid repeating unsuccessful arterial punctures with the same needle or cannula.
    - 4.9.2.6 Handle all body fluids as if contaminated.
    - 4.9.2.7 Dispose and transport specimens as appropriate.
- 4.10 Respiratory Devices
  - 4.10.11 Resuscitation bags
    - 4.10.11.1 Sterilization or high-level disinfection of bags between patients is recommended.
    - 4.10.11.2 When using a bag on the same patient, rinse it clear with sterile water immediately when the bag valve is visibly soiled with secretions.
    - 4.10.11.3 Reusable bags must be sent to CSSD for reprocessing.

- 4.10.12 Oxygen masks and cannulas
  - 4.10.12.1 Change tubing and any device, such as a cannula and mask, used to deliver oxygen from a wall outlet between patients.
  - 4.10.12.2 Restrict the use of bubble type humidifiers (BTHs) to appropriate situations. Humidifiers are not indicated for oxygen flow less than 4 L/min in adult patients under normal conditions. When operated at a flow above 10 L/min, a standard unheated BTH designed for oxygen delivery is less efficient than a humidifier and may create aerosols that can transmit bacteria.
- 4.10.13 Pulse oximetry
  - 4.10.13.1 Disinfect probes immediately between patients according to the manufacturer's recommendations.
  - 4.10.13.2 Avoid the use of clip-on probes over edematous areas
  - 4.10.13.3 Check the site frequently, repositioning the probe as necessary.
  - 4.10.13.4 Reposition all probes at appropriate time intervals in accordance with the manufacturer's recommendations.
- 4.10.14 Pulmonary function testing (PFT)
  - 4.10.14.1 Pulmonary function testing (PFT)
  - 4.10.14.2 Do not routinely disinfect the internal machinery of PFT machines between uses.
  - 4.10.14.3 Sterilize or disinfect any external devices (e.g., nose clips and mouthpieces) between patients according to the manufacturer's recommendations.
  - 4.10.14.4 The use of low-resistance, high-efficiency filters has been advocated for use between the mouth-piece and the spirometer to minimize contamination between device and patient. This filter may also reduce HCW exposure to droplet nuclei generated by the patient during forced expiratory maneuvers.
- 4.11 Reprocessing Respiratory Care Services
  - 4.11.1 Respiratory care devices have been classified as semi-critical because they come into contact with mucous membranes but do not ordinarily penetrate body surfaces.
  - 4.11.2 All single-use disposable devices must be discarded immediately after use
  - 4.11.3 Do not reprocess equipment and devices that are manufactured "for single use only"
  - 4.11.4 Proper cleaning and sterilization or high-level disinfection of reusable equipment is important to reduce infection.
  - 4.11.5 All reusable equipment or devices must be sent to CSSD for reprocessing
  - 4.11.6 The manufacturer's recommendations must be made available to CSSD to efficiently and effectively clean, disinfect and sterilize these items.

## **5. MATERIALS AND EQUIPMENT:**

- 5.1 **Forms and Records:**
  - 5.1.1 N/A
- 5.2 **Materials and Equipment**
  - 5.2.1 N/A

## **6. RESPONSIBILITIES:**

- 6.1 Respiratory Therapist Staff




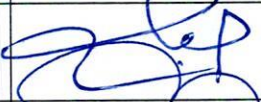



## **7. APPENDICES:**

- 7.1 N/A

## **8. REFERENCES:**

- 8.1 GCC 3rd Edition 2018. <http://gdipc.org/wp-content/uploads/2018/07/The-GCC-Infection-Prevention-and-Control-Manual-3rd-Edition.pdf>
- 8.2 Association for Professionals in Infection Control (APIC) and Epidemiology, Inc. (2014). Chapter 67: Respiratory care services. In APIC Text of infection control and epidemiology (4th ed.).

## 9. APPROVALS:

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