

**PROCEDURE FOR: Ventilator Circuit Changes in NICU**

**RATIONALE:** The ventilator circuit change consists of placing a clean ventilator circuit on an operating mechanical ventilator. The ventilator circuit consists of: gas delivery tubing (large bore), monitoring tubing (small bore), humidifier, humidifier water reservoir, water columns, thermal monitoring probes, medication delivery device.

The objectives of the ventilator circuit change procedure as described are:

1. To limit the occurrence of nosocomial infection acquired as a consequence of endotracheal intubation or tracheostomy and ventilatory support.
2. To assure that the ventilator-circuit system maintains its physical integrity and proper function.
3. To provide a circuit that is clean in appearance.
4. To minimize the risk of harm to the patient and health care personnel during the process of changing the circuit.

**PROCEDURE: *INDICATIONS:***

The decision to change a ventilator circuit should be governed by:

1. Length of time the existing circuit has been in use;
  - a. Neonatal ventilator circuits are to be changed every two weeks.
  - b. At the time of ventilator change a new sticker that is dated and initialed will be placed on the expiratory limb of the circuit next to the expiratory port of the machine.
  - c. Each new ventilator circuit will receive a sticker dated, initialed, and placed on the expiratory limb of the circuit next to the expiratory port of the machine.
  - d. Ventilators that have been discontinued with the start up of any other change in mode of therapy will remain at the bedside for 6 - 12 hours. At the time of the discontinuance a sticker will be placed on the ventilator, dated and timed.
2. Type of circuit and humidification device in use;
3. Circuit function (presence of a malfunctioning circuit or a circuit that leaks);
4. Appearance of ventilator circuit (circuits that are not clean in appearance should be replaced).

***CONTRAINdications:***

1. Presence of conditions in the patient's cardiopulmonary or neurologic status that might make tolerance of disconnection from mechanical ventilation hazardous to the patient.

Respiratory Therapy - Unit Practice Manual  
John Dempsey Hospital - Department of Nursing  
The University of Connecticut Health Center

**PROCEDURE FOR: Ventilator Circuit Changes in NICU**

2. Inability to safely and effectively ventilate or maintain patient during the ventilator circuit change.
3. Absence of a clean and functional circuit to use as a replacement.

**HAZARDS/COMPLICATIONS:**

1. Patient's condition may predispose him or her to harm or injury during the changing process.
  - a. hemodynamic instability
  - b. hypo or hyperoxia with sequela
  - c. hyper or hypocapnia
  - d. airway obstruction
  - e. artificial airway displacement
  - f. contamination of patient or staff from exposure to material in circuit
2. Patient may not be safely maintained during disconnection from ventilator.
  - a. Inappropriate or inadequate ventilation (f and/orVt)
  - b. Inappropriate or inadequate oxygenation (FiO<sub>2</sub> and/or PEEP)
  - c. Inappropriate increase in work of breathing
  - d. Airway obstruction
3. Inability to assure that the replacement circuit has been safely and effectively disinfected and that is operationally sound.
  - a. Transmission of pathogens to patient and to health care personnel.
  - b. Hazards of exposure to residual toxic disinfectants or associated disinfectant products.
  - c. Malfunctioning or suboptimally functioning ventilator or circuit.
  - d. Failure to assure proper ventilator function with patient reconnection (i.e., correct settings, absence of leaks, functioning alarms, proper alarms, proper valve placement).
  - e. Potential patient-ventilator disconnection.
4. Manipulation and disconnection of the ventilator tubing can cause contaminated ventilator condensate to the patient's airway, exposing the patient to further risk of infection.
5. Changing ventilator circuits more frequently than is necessary may increase the risk of nosocomial pneumonia.

PROCEDURE FOR: Ventilator Circuit Changes in NICU

6. Failure to assure proper ventilator function prior to reinstating mechanical ventilation may endanger patient.

REFERENCES: Respiratory Care 1994; 39(8): 797-802

APPROVAL:

EFFECTIVE DATE: 2/04

REVISION DATES: