

**Respiratory Care Services
John Dempsey Hospital
Policy and Procedure Manual**

Subject: Mechanical Ventilation

Rationale: Ventilators are designed for the critically ill patient who is intubated with respiratory failure from any cause including the following:

1. Inability to maintain a patent airway or clear secretions
2. Inability to adequately oxygenate tissues
3. Inability to adequately eliminate CO₂ with patient's own respirations
4. Macroscopic or microscopic atelectasis

Equipment: Ventilator
Circuit
Heated Humidifier or HME
Concha Aquapak
Temperature Probe
Flowsheet

Procedure: *Ventilator Checks and Settings*

1. Ventilator settings in regards to tidal volume, FIO₂, PEEP, mode of delivery (i.e. A/C, CPAP, IMV), pressure support and in NICU/Pediatrics, inspiratory time are per physician or nurse practitioner's written order.
 - a. The exception to requiring a written order is a STAT situation. The procedure for a STAT ventilator order is as follows:
 - verbal order by a physician or relayed by a nurse is acceptable
 - deliver the required therapy or setting change.
 - the nurse or physician who gave the verbal order must document that order in the chart as soon as possible after the STAT situation has been resolved (but always within 24 hours.)
 - in the event the order cannot be written before the therapist leaves the floor, the therapist should document in the progress notes what the order was, who gave the order, what actions they took to get the order signed, and the date and time of the order.

2. *Flow rates and waveforms* are left to the therapist's discretion with the following understanding:
 - a. I: E ratios shall not fall less than 1:1 unless specified in the patient's orders or unless inverse ratio pressure support ventilation has been ordered.
 - b. If the ventilator being used in a Time Cycled mode to deliver volume ventilation, the flow rate will be set in accordance with the accepted formula $(I \text{ Time} \times \text{LPM} \times 1000) / 60$ (also found on ventilator flow sheet).
3. *Apnea Parameters* will be set with the patient's most current settings and a time of 20 seconds.
4. *Ventilator checks* must be done every four hours (+ or - 15 minutes) and documented on the ventilator flow sheet.
5. *Oxygen* should be analyzed when the ventilator is initiated and each day thereafter and documented on the ventilator flow sheet.
6. *Humidification* - to ensure adequate humidification, temperature verification will be done every four hours during routine vent checks. Verification will be done by utilizing the temperature probe located at the Wye port of the patient circuit. The reading should be between 31 - 35 degrees centigrade. The temperature is to be recorded on the ventilator flow sheet.

HME setups are required to be changed out to a heated and humidified ventilator circuit after 48 hours of use.

7. *Circuit changes* will occur as follows:
 - The night shift staff will perform NICU and ICU circuit changes every two weeks
 - In addition, a circuit should always be changed whenever it is visibly soiled.
 - Face shields, gloves and gowns should be worn when doing any circuit changes.

8. *Pressure Support* - Puritan Bennett recommends that the 7200 be set to the patient's Resistance. The formula to determine Resistance is:
$$R = (\text{Peak Inspiratory Pressure (-PEEP)} - \text{Plateau Pressure}) / \text{Flow rate}$$
9. *Resuscitation Bags* for the mechanically Ventilated Patient - any patient receiving PEEP of 5 or greater shall have his/her bedside "resuscitation bag" fitted with a PEEP valve which has been properly set to the same PEEP as that the patient is receiving while on the ventilator
10. *Infection Control Issues* - Generally neither the ventilator circuit nor the condensation from the circuit is considered infectious waste or identified as one of the "Red-Bag" waste items requiring "*Red Bag*" Waste Handling. Unless there is visible contamination with blood or the circuit is from a patient isolated to protect others from a highly communicable disease, the patient's ventilator circuit may be removed and disposed of into the regular trash waste.

References:

1. American Association for Respiratory Care Guidelines; AARC, 1992
2. Puritan Bennett 7200 Operator's Manual, 1990
3. JDH "Red-Bag Waste Program" – Department of Epidemiology Booklet, Revised 1994

Issued: 07/20/93

Revised: 10/25/94, 12/94, 10/95, 9/96, 1/98, 6/98, 11/05