(A) Policy Statement

Initiating mechanical ventilator settings, ventilator assessments, and establishing ventilator alarm settings, shall be in accordance to the following procedure.

(B) Purpose of Policy

To provide guidelines for the assembly and function testing of mechanical ventilators, and to establish guidelines for the initial ventilation and safety alarm settings, after receiving orders from the appropriate physician.

Indications: for mechanical ventilation include, but are not limited to, uncompensated respiratory acidosis, refractory oxygenation failure, central or obstructive apnea, increased work of breathing (paradoxical respiration), narcotic overdose, and cerebral edema.

Goal: the goal of mechanical ventilation is to augment or to assist the respiratory function of patients with ventilatory or oxygenation failure.

Contraindications: include patients who have a written "No Mechanical Ventilation" status, as established per appropriate physician.

Hazards: of mechanical ventilation include, but are not limited to, hyperventilation, hypoventilation, pneumothorax, hypotension, over/under pulmonary hydration, mechanical malfunction and/or accidental disconnect, loss of airway, oxygen toxicity and nosocomial infections.

(C) Procedure

Please also refer to Nursing Service Standard of Care and Practice: Management of the Intubated Patient and Daily Spontaneous Breathing Trial

1. Equipment and documents for mechanical ventilation shall consist of:
   a. Positive pressure ventilator, set up with appropriate ventilator tubing and HME.
   b. Self-inflating resuscitation bag with O2 tubing and flowmeter.
2. **Ventilator system** pre-initiation operational check.
   a. Ventilators to be used shall be cleaned then disinfected before connection of a disposable ventilator circuit. After the 840 ventilator is cleaned, and a new circuit put on, an SST procedure will be performed. alarm volume turned all the way up, then covered and placed in the storage area for ventilators.
   b. Adjust the ventilator settings according to the physician’s orders and the following guidelines:
      1) Set respiratory rate should be between 8 and 20 breaths/minute, tidal volume should be ≥4 and ≤6 mL/Predicted Body Weight (with ARDS) and ≥6 and ≤8 mL/Predicted Body Weight (Without ARDS). Any order outside this range should be verified with the physician. Set FiO2 as prescribed by physician.
      2) PEEP should be double checked if ordered more than 5cm H2O.
      3) Peak flow should be set to deliver no less than a 1:2 I:E ratio, unless specified per physician.
      4) Sensitivity should be set so that the patient has to generate no more than (-1) to (-2)cm H2O pressure to initiate flow from the machine.
      5) **Alarm settings**: Alarm settings should be tailored to the individual patient
         (a) **Low pressure alarm** will be adjusted to approximately 10 cm H2O below the patient’s peak inspiratory pressure.
         (b) **Low tidal volume alarm** will be adjusted to 50% below desired exhaled tidal volume, or spontaneous tidal volume, if on a low SIMV rate, 6 or below.
         (c) **Low minute volume alarm** will be adjusted 2 – 5 L/min below minimum SIMV or assist-control back-up minute ventilation.
         (d) **The high pressure alarm** limit will be set at 50 cm H2O then adjusted to 10 – 20 cm H2O above PIP.
         (e) **All alarms must be sufficiently audible with respect to distances and competing noises.**
         (f) **Alarm response**: for all audible ventilator alarms, the nearest available therapist, or if appropriate, nurse, will respond immediately to the patient’s bedside and assess for a disconnection, or respiratory distress.
   6) Humidification (if using heated): initial setting of 2.0 on the Concha, check airway temperature in 30 minutes and adjust to maintain 32 - 34 degrees C.

3. **The procedure of attaching (initiation)** the ventilator to the patient:
   a. The Respiratory Care personnel will check and document the following after connecting the patient to the ventilator:
      1) Breath sounds.
      2) Exhaled tidal volume.
      3) Respiratory rate.
      4) Sensitivity and synchronization.
      5) Chest movement.
      6) Airway pressure.
      7) Inspiratory time and flow.
      8) I:E ratio.
      9) Stability of tube (check for need to re-secure). Evaluation of endotracheal tube stability and integrity will be performed QShift and PRN. If the endotracheal tube stabilizing device is loose, the tube must be re-secured. The position of the oral ETT should be adjusted from the left, middle, right within the oral cavity and appropriately documented. Evaluation and documentation of endotracheal tube cuff integrity should be performed
upon initiation of mechanical ventilation (may check cuff pressure and adequate return volumes), and PRN. Cuff pressure should be measured with a pressure measuring device and maintained between 20-30 cmH2O.

10) Patients will be evaluated for suctioning on a PRN basis. The procedure for suctioning is described in policy #3364-136-04-04 of this manual.

11) Arterial blood gases shall be drawn and analyzed with a physician order.

12) Oral care, correct positioning of patient and suction equipment change out should also be documented.

4. **Ventilator Assessment:** the ventilator downloads information through the DAS to the electronic medical record. The therapist ascertains the information is correct and complete, then saves the ventilator data, as appropriate, then signs the ventilator assessment electronically. A ventilator flow sheet will be used to document all ventilator settings and patient airway data if the EMR is unavailable or “down”. Routine ventilator assessments will be completed q4 hours, and after a patient transport to verify alarm settings.

5. **The Respiratory Care Charge Therapist, Shift Supervisor or Director** will be informed of the initiation of all ventilators as soon as practical.

6. *If a patient should present with any of the adverse reactions to mechanical ventilation listed in RC departmental policy #3364-136-05-01, the practitioner is responsible for proper documentation in the electronic medical record or on a respiratory flow sheet as to his/her corrective action/involvement. If due to mechanical malfunction or practitioner error, after the appropriate corrective action has been taken, the respiratory supervisor, nurse, and physician on-call should be notified and an occurrence report generated.*

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**Approved by:**

Michael Taylor  
Director, Respiratory Care  
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Date

Monecca Smith  
Chief Nursing Officer  
3-1-2017  
Date

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**Policies Superseded by This Policy:**