

# Mechanical Ventilation in the Home

## **Purpose:**

To establish and maintain mechanical ventilation safely and effectively in the home. To establish mechanical ventilation sufficient to maintain adequate carbon dioxide elimination and acceptable oxygenation of arterial blood.

## **Responsible Party:**

RN, LVN/LPN or other responsible person competent to perform this procedure.

## **General Information:**

- Mechanical ventilation is indicated for patients requiring mechanical respiratory support for conditions including (but not limited to) apnea, acute ventilatory failure, impending ventilatory failure and refractory hypoxemia.
- A. Discharge and Home Monitoring
1. Arterial blood gas studies will be obtained as ordered by physician, when clinical signs indicate a need for evaluation.
  2. Ventilator checks should be performed every 1 hour. Findings should be recorded on nursing documentation forms.
  3. The patient's general clinical status is to be assessed no less than every 4 hours, including vital signs, urine output, temperature and hemodynamic data, as applicable.
  4. Laboratory data will be ordered on an individual basis, and may include:
    - a) Hemoglobin.
    - b) Serum electrolyte concentrations.
    - c) Cultures.
  5. Spontaneous volumes will be assessed as appropriate:
    - a) Minute volume.
    - b) Tidal volume.
    - c) Vital capacity.
    - d) Negative inspiratory.
- B. Complications:
1. Barotrauma (may be indicative of pneumothorax, subcutaneous emphysema, pneumopericardium or pneumomediastinum).
  2. Increased mean intrathoracic pressure (indicative of decreased venous return and decreased cardiac output).
  3. Decreased urine output (indicative of decreased renal blood flow and increased antidiuretic hormone excretion).
  4. Mechanical ventilator malfunction.

**Equipment:**

- ✓ Appropriate ventilator.
  - ✓ Oxygen source.
  - ✓ Oxygen analyzer.
  - ✓ Sterile distilled water.
  - ✓ Humidifier.
  - ✓ Adequate power source.
  - ✓ Antimicrobial scrub.
  - ✓ Gloves.
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**Procedure:**

1. Identify patient and explain procedure.
2. Wash hands thoroughly with antimicrobial scrub.
3. Assemble equipment. Pre-fill humidifier with distilled water (if applicable).
4. Read ventilator check-off tag to verify inspection of ventilator and completion of machine circuitry.
5. Connect ventilator to power sources: oxygen source, electrical outlet, and compressed air outlet, if applicable.
6. Inspect integrity of circuit:
  - a) Turn pressure limit to maximum.
  - b) Set volume greater than 500cc.
  - c) Set peak flow at 40 L/min.
  - d) Occlude patient connector.
  - e) Press manual VT (tidal volume) button. (Note: Pressure alarm should go off, indicating that there are no leaks in circuit.)
7. Set ordered parameters:
  - Mode.
  - Tidal volume.
  - Rate.
  - Oxygen concentration.
8. Don gloves.
9. Connect ventilator to patient's artificial airway, and observe and assess patient for the following:
  - a) Rise and fall of chest.
  - b) Breathing pattern.
  - c) Breath sounds.
  - d) Vital signs.
10. Set and verify alarms limits:
  - a) If managing an LP-4 ventilator, ensure that pressure limit coincides with high pressure alarms, and use an external low pressure alarm.

11. Perform a ventilator check of the following:

- a) All parameters.
- b) Alarms.
- c) Exhaled volumes measurement.
- d) Fraction of inspired oxygen (FIO<sub>2</sub>) analysis (if applicable, although not generally done in the home).
- e) Circuit temperature.

12. Record all pertinent information on flow sheet and nursing documentation forms.