

Caring for the Mechanically Ventilated Patient

Mechanical ventilation is utilized in intensive care and long-term care settings to assist patients who require additional respiratory support. This handy reference guide provides critical patient care essentials, tips for trouble-shooting ventilator alarms, and potential complications.

Care Essentials for Patients on Mechanical Ventilation

- Maintain a patent airway. Per policy, note endotracheal (ET) tube position (centimeters) and confirm that it is secure.
- Assess oxygen saturation, bilateral breath sounds for adequate air movement, and respiratory rate per policy.
- Check vital signs per policy, particularly blood pressure after a ventilator setting is changed. Mechanical ventilation increases intrathoracic pressure, which could affect blood pressure and cardiac output.
- Assess patient's pain, anxiety and sedation needs and medicate as ordered.
- Complete bedside check: ensure suction equipment, bag-valve mask and artificial airway are functional and present at bedside. Verify ventilator settings with the prescribed orders.
- Suction patient only as needed, per facility policy; hyperoxygenate the patient before and after suctioning and do not instill normal saline in the ET tube; suction for the shortest time possible and use the lowest pressure required to remove secretions.
- Monitor arterial blood gas (ABG) after adjustments are made to ventilator settings and during weaning to ensure adequate oxygenation and acid-base balance.
- To minimize the risk for ventilator-associated pneumonia (VAP), implement best practices such as strict handwashing; aseptic technique with suctioning; elevating head of bed 30-45 degrees (unless contraindicated); providing sedation vacations and assessing patient's readiness to extubate; providing peptic ulcer disease prophylaxis; providing deep vein thrombosis prophylaxis; and performing oral care with chlorhexidine, per your facility policy.

VENTILATOR ALARMS		
Alarm	Potential Causes	Interventions
High Peak Inspiratory Pressure (PIP)	<ul style="list-style-type: none"> • Blockage of ET tube (secretions, kinked tubing, patient biting on ET tube) • Coughing • Bronchospasm • Lower airway obstruction • Pulmonary edema • Pneumothorax 	<ul style="list-style-type: none"> • Assess lung sounds. • Suction airway for secretions. • Insert bite block or administer sedation per orders if patient is agitated or biting on ET tube.

	<ul style="list-style-type: none"> • Ventilator/patient dyssynchrony 	<ul style="list-style-type: none"> • Assess breath sounds for increased consolidation, wheezing, and bronchospasm; treat as ordered.
Low Pressure Alarm	<ul style="list-style-type: none"> • Air leak in ventilator circuit or in the ET tube cuff 	<ul style="list-style-type: none"> • Locate leak in ventilator system. • Check pilot balloon as an indicator of ET tube cuff failure. • Replace tubing as needed, per policy.
Low Minute Ventilation	<ul style="list-style-type: none"> • Low air exchange due to shallow breathing or too few respirations 	<ul style="list-style-type: none"> • Check for disconnection or leak in the system. • Assess patient for decreased respiratory effort.
Low O₂ Saturation (SpO₂)	<ul style="list-style-type: none"> • Pulse oximeter malpositioned • SpO₂ cable unplugged 	<ul style="list-style-type: none"> • Ensure ventilator oxygen supply is connected. • Ensure pulse oximeter is positioned correctly. • Verify all cables are plugged in. • Assess patient for respiratory distress.
Apnea	<ul style="list-style-type: none"> • Breaths are not being taken by the patient or triggered on the ventilator 	<ul style="list-style-type: none"> • Assess patient effort. • Check system for disconnections.

COMPLICATIONS RELATED TO MECHANICAL VENTILATION

Patient Complication	Potential Causes	Interventions
Cardiovascular issues	<ul style="list-style-type: none"> • Decrease in venous return to the heart due to positive pressure applied to the lungs. 	<ul style="list-style-type: none"> • Assess for adequate volume status by checking heart rate, blood pressure, central venous

		pressure and urine output.
Barotrauma/Pneumothorax	<ul style="list-style-type: none"> • Positive pressure applied to lungs. • Elevated mean airway pressures may rupture alveoli. 	<ul style="list-style-type: none"> • Notify healthcare provider. • Prepare patient for possible chest tube insertion. • Avoid high pressure settings for patients with chronic obstructive pulmonary disease (COPD), acute respiratory distress syndrome (ARDS), or history of pneumothorax.
Infection	<ul style="list-style-type: none"> • Breaks in ventilator circuit. • Decreased mobility. • Impaired cough reflex. 	<ul style="list-style-type: none"> • Use aseptic technique. • Provide frequent mouth care. • Support proper nutritional status.

References:

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