American College of Emergency Physicians®

ADVANCING EMERGENCY CARE

POLICY STATEMENT

Approved February 2023

Mechanical Ventilation

Reaffirmed February 2023

Originally approved October 2017

Airway management is a cornerstone of emergency medicine practice and one of the expert skills of the emergency physician. The emergency physician should not only be adept at endotracheal intubation but also familiar with the strategies involved in the initial management of mechanical ventilation. Choosing an appropriate ventilator strategy will ensure the best clinical outcome and avoid complications, such as barotrauma, oxygen toxicity, and ventilator-associated pneumonia. This is particularly relevant in the setting of crowding, prolonged emergency department (ED) boarding times, and rise in the number of ED-based critical care units. A collaborative team effort that includes nursing and respiratory care is essential to providing optimal care of the ventilated patient.

The American College of Emergency Physicians (ACEP) is the authoritative body for the establishment of guidelines for rapid sequence intubation and mechanical ventilation in the emergency setting. To promote the safe and effective use of mechanical ventilation in ED patients, ACEP recommends the following:

- The mechanical ventilation strategy should be individualized with consideration of the patient's underlying disease process. Consider lung protective strategies that include limiting tidal volume, maintaining lung recruitment, limiting airway pressures, and minimizing oxygen toxicity. Providers may also follow measures of lung compliance, such as plateau pressure or driving pressure, to help reduce incidence of barotrauma and lung injury.

- Continuous quantitative waveform capnography (end tidal carbon dioxide) monitoring is recommended, and a post-intubation blood gas measurement may be obtained to ensure appropriate ventilator settings (eg, respiratory rate, tidal volume, fraction of inspired oxygen [FiO_2]).

- Patients should be maintained on appropriate doses of analgesia and sedation to maintain comfort while on mechanical ventilation.

- Unless contraindicated, elevate the head of the bed to at least 30 degrees to prevent ventilator-associated pneumonia.

- As prolonged periods of hyperoxia may lead to iatrogenic injury, titrate down the FiO_2 to maintain appropriate oxygen saturation.

Resources

Brower RG, Matthay MA, Morris A, et al. For the Acute Respiratory Distress Syndrome Network. Ventilation with lower tidal volumes as compared with traditional tidal volumes for acute lung injury and the acute respiratory distress syndrome. *N Engl J Med*. 2000;342:1301-1308.

Spiegel R, Mallemat H. Emergency department treatment of the mechanically ventilated patient. *Emerg Med Clin N Am.* 2016;341:63-75.

Weingart SD. Managing initial mechanical ventilation in the emergency department. *Ann Emerg Med*. 2016;68:614-617.