



The guidelines were a cooperative effort among the American Thoracic Society and  
The American College of Chest Physicians

# Liberation from Mechanical Ventilation

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Key Points

Recommendations

## ↪ Key Points

- **Mechanical ventilation is a life-saving intervention, but it is also associated with complications. Therefore, it is desirable to liberate patients from mechanical ventilation as soon as the underlying cause that led to the mechanical ventilation has sufficiently improved and the patient is able to sustain spontaneous breathing and adequate gas exchange.**
- **These clinical practice guidelines provide recommendations regarding seven management strategies that have been shown to improve outcomes for acutely hospitalized adults who are mechanically ventilated >24 hours.**

## ↪ Recommendations

- **For acutely hospitalized patients ventilated >24 hours, the ATS and CHEST suggest that the initial SBT be conducted with inspiratory pressure augmentation (5–8 cm H<sub>2</sub>O) rather than without (T-piece or CPAP). (Conditional recommendation, moderate certainty in the evidence)**
  - Remark: This recommendation relates to how to conduct the initial SBT but does not inform how to ventilate patients between unsuccessful SBTs.
- **For acutely hospitalized patients ventilated for >24 hours, the ATS and CHEST suggest protocols attempting to minimize sedation. (Conditional recommendation, low certainty in the evidence)**
  - Remark: There is insufficient evidence to recommend any protocol over another.
- **For patients at high risk for extubation failure who have been receiving mechanical ventilation for >24 hours, and who have passed an SBT, the ATS and CHEST recommend extubation to preventative NIV. (Strong recommendation, moderate certainty in the evidence)**
  - Remark: Patients at high risk for failure of extubation may include those patients with hypercapnia, chronic obstructive pulmonary disease (COPD), congestive heart failure (CHF), or other serious co-morbidities. Physicians may choose to avoid extubation to NIV in selected patients for patient-specific factors including but not limited to the inability to receive ventilation through a mask or similar interface. Physicians who choose to use NIV should apply such treatment immediately after extubation to realize the outcome benefits.

## Recommendations

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- **For acutely hospitalized adults who have been mechanically ventilated for >24 hours, the ATS and CHEST suggest protocolized rehabilitation directed toward early mobilization.**  
(**Conditional recommendation, low certainty in the evidence**)
- Remark: There is insufficient evidence to recommend any rehabilitation protocol over another.
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- **The ATS and CHEST suggest managing acutely hospitalized adults who have been mechanically ventilated for >24 hours with a ventilator liberation protocol.**  
(**Conditional recommendation, low certainty in the evidence**)
- Remark: The ventilator liberation protocol may be either personnel-driven or computer-driven.
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- **The ATS and CHEST suggest performing a cuff leak test (CLT) in mechanically ventilated adults who meet extubation criteria and are deemed high risk for post-extubation stridor (PES).**  
(**Conditional recommendation, very low certainty in the evidence**)
- Remark: Risk factors for PES include: traumatic intubation, intubation >6 days, large endotracheal tube, female sex, and reintubation after unplanned extubation.
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- **For adults who have failed a CLT but are otherwise ready for extubation, the ATS and CHEST suggest administering systemic steroids 4–24 hours before extubation.**  
(**Conditional recommendation, moderate certainty in the evidence**)
- Remark: A repeat CLT is not required following the administration of systemic steroids.

## Sources

Schmidt GA, et al. Official Executive Summary of an American Thoracic Society / American College of Chest Physicians Clinical Practice Guideline: Liberation from Mechanical Ventilation in Critically Ill Adults. *Am J Respir Crit Care Med* 2017; 195(1):115-119 and *CHEST* 2017; 151(1):160–165.

Girard TD, et al. Liberation from Mechanical Ventilation in Critically Ill Adults: An Official American Thoracic Society/American College of Chest Physicians Clinical Practice Guideline. Rehabilitation Protocols, Ventilator Liberation Protocols, and Cuff Leak Tests. *Am J Respir Crit Care Med* 2017; 195(1):120–133.

Ouellette DR, et al. Liberation from Mechanical Ventilation in Critically Ill Adults: An Official American College of Chest Physicians/American Thoracic Society Clinical Practice Guideline. Inspiratory Pressure Augmentation during Spontaneous Breathing Trials, Protocols Minimizing Sedation, and Non-invasive Ventilation Immediately After Extubation. *CHEST* 2017; 151(1): 166–180.

**Table 1. Interpretation of strong and conditional (weak) recommendations**

	<b>Strong recommendation</b>	<b>Conditional (weak) recommendation</b>
<b>Patients</b>	Most individuals in this situation would want the recommended course of action, and only a small proportion would not.	The majority of individuals in this situation would want the suggested course of action, but many would not.
<b>Clinicians</b>	Most individuals should receive the intervention. Adherence to this recommendation according to the guideline could be used as a quality criterion or performance indicator. Formal decision aids are not likely to be needed to help individuals make decisions consistent with their values and preferences.	Recognize that different choices will be appropriate for individual patients and that you must help each patient arrive at a management decision consistent with his or her values and preferences. Decision aids may be useful in helping individuals to make decisions consistent with their values and preferences.
<b>Policy makers</b>	The recommendation can be adopted as policy in most situations.	Policymaking will require substantial debate and involvement of various stakeholders.



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## Abbreviations

ATS, American Thoracic Society; CHEST, The American College of Chest Physicians; CHF, congestive heart failure; CLT, cuff leak test; COPD, chronic obstructive pulmonary disease; CPAP, Continuous positive airway pressure; PES, post-extubation stridor; SBT, spontaneous breathing trial; NIV, non-invasive ventilation

## Disclaimer

*This Guideline attempts to define principles of practice that should produce high-quality patient care. It is applicable to specialists, primary care, and providers at all levels. This Guideline should not be considered exclusive of other methods of care reasonably directed at obtaining the same results. The ultimate judgment concerning the propriety of any course of conduct must be made by the clinician after consideration of each individual patient situation. Neither IGC, the medical associations, nor the authors endorse any product or service associated with the distributor of this clinical reference tool.*



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