

## ICU Management Protocol No. 10

# WEANING OR DISCONTINUATION FROM MECHANICAL VENTILATION

In patients requiring mechanical ventilation for more than 24 hours, a search for all causes that may be contributing to ventilator dependence should be undertaken. Reversing all possible ventilatory and non-ventilatory issues should be an integral part of the weaning process.

Before a patient is considered a candidate for discontinuation of ventilatory support, a basic level of physiologic readiness must be established.

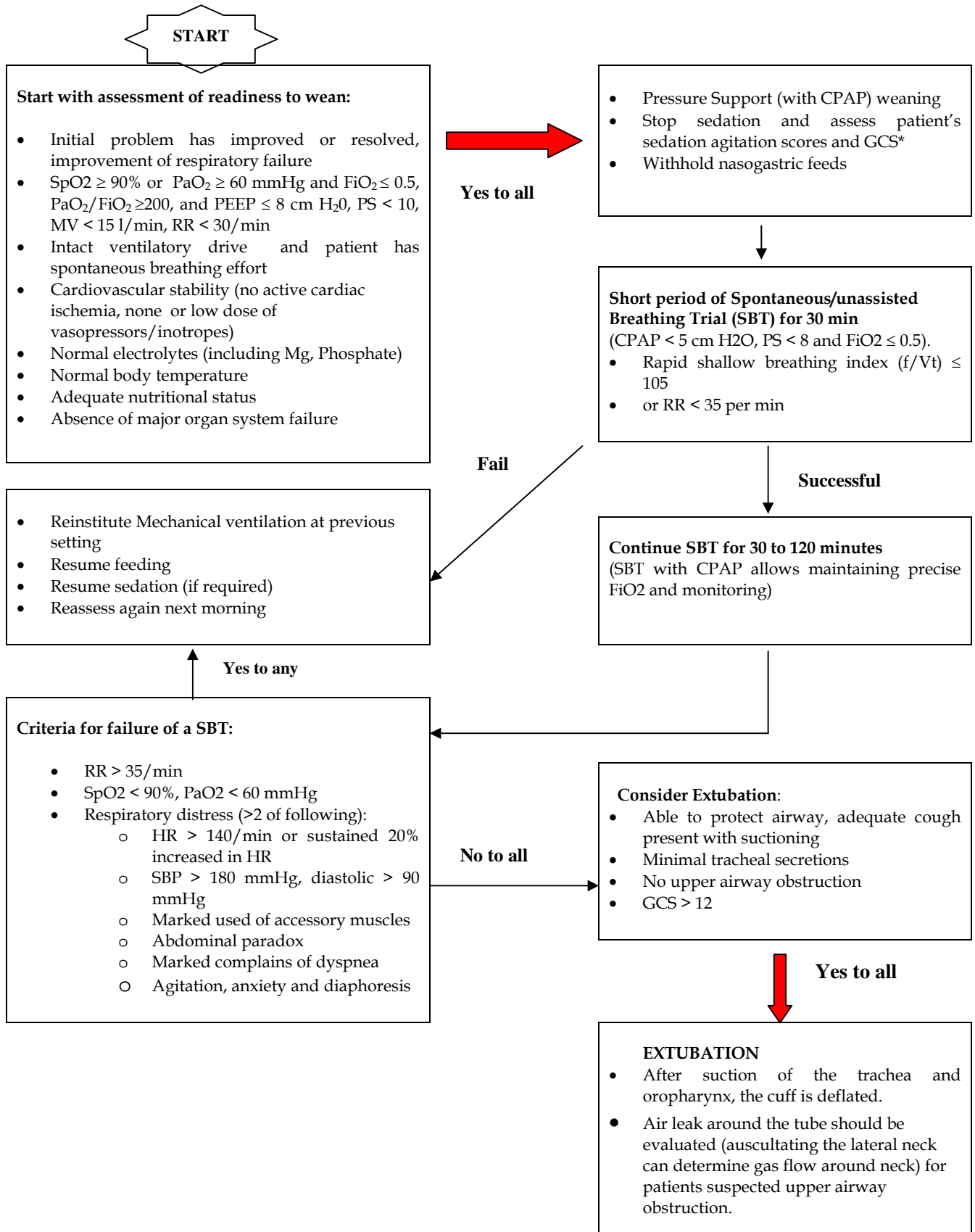
*Refer to the flow chart.*

### **Common reasons for weaning failure:**

- Chronic hypercapnic state
- Decreased CNS drive
- Weaning to exhaustion and inadequate rest of respiratory muscles
- Reduced respiratory pump capacity
  - Poor nutritional status
  - Electrolyte disturbances (decreased calcium, magnesium and phosphate levels)
  - Polyneuropathy of critical illness
  - Corticosteroid therapy
  - Prolonged neuromuscular blockade
- Auto-Peep
- Increased airway resistance (bronchospasm, endotracheal tube obstruction)
- Decreased lung or chest wall compliance
- High ventilation requirements due to increased dead space
- Overfeeding
- Myocardial ischaemia, left heart failure
- Infection/fever
- Major organ system failure

**Points to remember:**

1. Ensure an appropriate mix of work and rest periods, assurance of proper sleep and nutrition are helpful.
2. Patients who fail a spontaneous breathing trial (SBT) should have the cause for the failed SBT determined. Once reversible causes for failure are corrected, subsequent SBT should be performed every 24 hours.
3. Patients who fail an SBT should receive a stable, non-fatiguing, comfortable form of ventilatory support.
4. Protocols to decrease the use of continuous intravenous sedation reduce the duration of weaning.
5. Tracheostomy should be considered when it is apparent that the patient requires prolonged ventilator assistance. Even though the timing of tracheostomy is still controversial, it is recommended to consider tracheostomy if anticipated ventilation is going to be > 7 days. Advantages of tracheostomy include decrease need for sedation, more secure airway enabling greater patient mobility, improved efficiency of airway suctioning, faster weaning from mechanical ventilation and reduced length of stay in the ICU.
6. Unless there is evidence for clearly irreversible disease (e.g. high spinal cord injury, advanced amyotrophic lateral sclerosis), a patient requiring prolonged mechanical ventilatory support for respiratory failure should not be considered permanently ventilator dependent until 3 months of failed weaning attempts.
7. Weaning strategy in the prolonged mechanically ventilated patient should be slow-paced, and include gradually lengthening spontaneous breathing trials.



**References:**

1. MacIntyre N, Cook D, Ely E, et al (2001). Evidence-based guidelines for weaning and discontinuing ventilatory support: A collective Task Force facilitated by the American College of Chest Physicians; American Association for Respiratory Care and the American College of Critical Care Medicine. *Chest* 120:375S-396S.
2. Esteban A, Anzueto, Cook D (2004). Evidence-Based Management of Patients with Respiratory Failure.