



Guide to Spontaneous Breathing Trial

Clinical criteria used to determine readiness for Spontaneous Breathing Trial

Required criteria
1. The cause of the respiratory failure has improved
2. $\text{PaO}_2/\text{FiO}_2 \geq 150$ or $\text{SpO}_2 \geq 90\%$ on $\text{FiO}_2 \leq 40\%$ and $\text{PEEP} \leq 10 \text{ cmH}_2\text{O}$
3. $\text{pH} > 7.2$
4. Hemodynamic stability (no or low dose vasopressor medications: Dopamine 5mcg/kg/min, Norepinephrine 0.1mc/kg/min)
5. Able to initiate an inspiratory effort
Additional criteria
1. No new infection or sepsis
2. Core temperature ≤ 38 to 38.5°C
Exclusion criteria
1. Hemodynamic instability
2. Inability to wean sedation (seizures, drug withdrawals, increased ICP)

PaO_2 : arterial oxygen tension; FiO_2 : fraction of inspired oxygen; SpO_2 : arterial oxygen saturation; PEEP: positive end-expiratory pressure.

Weaning methods (30 min)

- PSV: Inspiratory pressure 0 -7 (about 5 cmH₂O) ± Tube compensation (ATC)
PEEP 0 -7 (about 5 cmH₂O)
- CPAP: PEEP 0-7 (about 5 cmH₂O) ± Tube compensation (ATC)
- ASV: 25-50% MV (all spontaneous breaths with PSV ≤ 7 cmH₂O)
- PAV+: 20% support (PSV ≤ 7 cmH₂O)
- T-piece

* Higher PEEP maybe required in morbid obesity especially in presence of esophageal balloon

Parameters of failure during a weaning trial

Parameter	Clinical findings
Respiratory	Tachypnea >35 breaths per minute for > 5 min
	Respiratory distress such as use of accessory muscles, thoracoabdominal paradox, Diaphoresis
Hemodynamic	Heart rate >140 beats/minute or a sustained increase of >20% for > 5 min
	Heart rate <50 beats/minute or decrease by > 20% of baseline
	Systolic blood pressure >180 mmHg or <90 mmHg for > 5 min
Gas exchange	Inadequate oxygenation (e.g., peripheral saturation <90%, lower saturations to 88% may be tolerated in chronically hypoxemic patients; arterial oxygen tension <50 mmHg)
	Inadequate ventilation (e.g., an increase in PaCO ₂ of >10 mmHg from pre-weaning value) EtCO ₂ > 10 from preweaning)
Neurologic	Reduced mental status (e.g., somnolence, agitation, delirium)

Additional recordings to assess readiness at the end of the SBT:

- RR
- Minute Ventilation
- RSBI (Rapid Shallow Breathing Index) < 105
- P0.1 (Airway occlusion at 100 msec) < 5-6 cmH₂O
- Cuff leak
- Adequate cough

If patient meets failure criteria, place back on previous mode

If patient passed (tolerated) the SBT, consider 1- 2 hours rest on controlled mode or higher PSV

Please discuss with Intensivist to discuss if the patient is eligible to be extubated

Extubation to HFNC or NIV

(2-3 of criteria below)

8 – 48 hrs, HFNC can be used between NIV

High to very high-risk patients:

- Age > 65 years
- Acute Physiology and Chronic Health Evaluation II score > 12 on extubation day
- Body mass index > 30
- Inadequate secretions management
- Difficult or prolonged weaning
- Comorbidities:

Acute heart failure indicating mechanical ventilation

Moderate-to-severe chronic obstructive pulmonary disease

Airway patency problems

Prolonged mechanical ventilation or hypercapnia on finishing the SBT