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. PaO$_2$/FiO$_2$$ \geq 150$ or SpO$_2$$ \geq 90\%$ on FiO$_2$$ \leq 40\%$ and PEEP $\leq 10$ cmH$_2$O
3. 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 $\leq 38$ to $38.5^\circ$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 cmH\textsubscript{2}O) ± Tube compensation (ATC)
  PEEP 0 - 7 (about 5 cmH\textsubscript{2}O)
- CPAP: PEEP 0-7 (about 5 cmH\textsubscript{2}O) ± Tube compensation (ATC)
- ASV: 25-50\% MV (all spontaneous breaths with PSV ≤ 7 cmH\textsubscript{2}O)
- PAV+: 20\% support (PSV ≤ 7 cmH\textsubscript{2}O)
- T-piece

* Higher PEEP maybe required in morbid obesity especially in presence of esophageal balloon
# Parameters of failure during a weaning trial

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Clinical findings</th>
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<tbody>
<tr>
<td><strong>Respiratory</strong></td>
<td>Tachypnea &gt;35 breaths per minute for &gt; 5 min</td>
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<td>Respiratory distress such as use of accessory muscles, thoracoabdominal paradox, Diaphoresis</td>
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<td><strong>Hemodynamic</strong></td>
<td>Heart rate &gt;140 beats/minute or a sustained increase of &gt;20% for &gt; 5 min</td>
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<td>Heart rate &lt;50 beats/minute or decrease by &gt; 20% of baseline</td>
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<td></td>
<td>Systolic blood pressure &gt;180 mmHg or &lt;90 mmHg for &gt; 5 min</td>
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<td><strong>Gas exchange</strong></td>
<td>Inadequate oxygenation (e.g., peripheral saturation &lt;90%, lower saturations to 88% may be tolerated in chronically hypoxemic patients; arterial oxygen tension &lt;50 mmHg)</td>
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<td>Inadequate ventilation (e.g., an increase in PaCO₂ of &gt;10 mmHg from pre-weaning value)</td>
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<td>EtCO₂ &gt; 10 from preweaning)</td>
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<td><strong>Neurologic</strong></td>
<td>Reduced mental status (e.g., somnolence, agitation, delirium)</td>
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**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