### Respiratory Care Pocket Reference

#### Oxygen Sources & Delivery Devices

**High Flow Ventilation (HFOV)**

- In: Low FiO, high flow rate to achieve high FiO; Confusing terminology: PS (DP) 5/PEEP (EPAP) 5-10;
- Cons: Requires high flow; flowmeter to achieve high flow; maximum flow 150 LPM; tightly matched

#### Non-Invasive Ventilation (NIV)

**Continuous Positive Airway Pressure (CPAP)**

- Cons: In: Not for obstructive dysfunction; Only goes as far as the patient’s respiratory efforts; Titration is needed
- Cons: Requires high flow source to achieve high FiO

#### Pressure Support Ventilation (PSV)

- Cons: In: Not used for COPD; Goal of 15-20 cmH2O
- Cons: Requires high pressure source to achieve high FiO

### Choosing a Ventilator Mode

- Assisted control (PSV) or volume mode;?: No leak test; Volume control for obstructive dysfunction or NIV
- Pressure Control (PS/PC) Mode can be used for non-smooth breathing pattern or NIV
- Pressure Support (PS) Mode must be used in non-smooth breathing pattern or NIV

### Other Parameters & Functions

**Pressure Support (PS)**

- I:E 1:1 or >1:1 associated with PEEPi, decreased CO & O2.

**Peak Flow**

- High flow divided by ventilator setting during inspiration

### Initial Settings

- Adult & Pediatric

**Controlled Variables**

- Flow trigger, Rise time, Expiratory valve, PEEP, I:E ratio

**Fixed Parameters**

- Set T2, and set at needs; tidal volume goals (SV, ETV, Vt, ETV) based on both clinical and radiological

### Variables

- I:E 1:1 or >1:1 associated with PEEPi, decreased CO & O2.

### Flow

- Prime with Priming solution in line (CPM; CariSpan pulmonary system, CariSpan neonatal system, or CariSpan neonatal system, or CariSpan neonatal system)

### Apnea (Mute vent) will not work in this mode

### Expiratory Valve

- Active expiratory valve (unlike AC-VC) promotes synchrony

### Other Names & Functions

- PSV (Continuous Positive Airway Pressure)
**Lung-Protective Ventilation (LPV)**

**When to Use LPV**

- **Water-main tuberculous**
- **Severe hypoxemia**
- **ARDS**

**ARDS Berlin Definition for Adult ARDS with Modified Thresholds**

- **Acute respiratory failure** (PaO₂/FiO₂ ≤ 200 without positive end-expiratory pressure (PEEP) or Pplat ≥ 30 cmH₂O)
- **Mixed alveolar dead space**

**Acute Respiratory Distress Syndrome (ARDS) (cont’d)**

**Criteria for ARDS**

- **PaO₂/FiO₂ ≤ 200** without PEEP
- **Pplat ≥ 30 cmH₂O**

**Fluid Management**

- **Check respiratory changes**
- **Check chest x-ray**
- **Check vital signs**

**Adjunctive Therapies for ARDS Hypoxemia**

- **High pressure, low volume ventilation**
- **Open lung approach**
- **Regional recruitment and decancellation**

**High Pressures, Desaturations & Dyssynchrony**

- **High pressures**
- **Desaturations**
- **Dyssynchrony**

**Desaturations**

- **In the contralateral lung in good condition? (radionuclide)**
- **In the contralateral lung in poor condition? (radionuclide)**
- **Are there signs of infection? (radionuclide)**

**Ventilator-Related Dysynchrony**

- **Is the PEEP > 10 cmH₂O**
- **Is the PEEP > 10 cmH₂O**
- **Is the PEEP > 10 cmH₂O**

**Ventilator Weaning & Exubation**

**SBT Selection Criteria (or Consideration)**

- **Patient did not require ventilator and FiO₂ ≤ 0.5, stable > 24h**
- **P/F ratio > 300**
- **PEEP ≤ 5 cmH₂O**

**Weaning Strategies**

- **SBT 1: Goal OI < 300**
- **SBT 2: Goal OI < 200**

**Extracorporeal Oxygenation**

- **High flow oxygen**
- **Low flow oxygen**

**Contingency Planning**

- **Ensure transport (i.e., bag valve mask ventilation) device is available and team trained in use with a facemask and CPR**

**Respiratory Care, Setup, & Monitoring**

- **Impact of sedation on ventilator response and lung recruitment**
- **Include a seated position**
- **Ensure chest wall movement and breathing pattern**

**PEEP & FIO2**

- **Inspiration time**
- **Expiration time**
- **Tidal volume**

**Additional LPV Reference Calculations**

<table>
<thead>
<tr>
<th>Predicted Body Weight (BMI) (kg)</th>
<th>45-50</th>
<th>51-60</th>
<th>61-70</th>
<th>71-80</th>
<th>81-90</th>
<th>91+</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FIO2 for HME</strong></td>
<td>0.21</td>
<td>0.24</td>
<td>0.27</td>
<td>0.29</td>
<td>0.32</td>
<td>0.35</td>
</tr>
<tr>
<td><strong>PEEP for SBT</strong></td>
<td>10</td>
<td>12</td>
<td>14</td>
<td>16</td>
<td>18</td>
<td>20</td>
</tr>
</tbody>
</table>

**SBT Selection**

- **Mark as 'SBT' if patient is ready for ventilator extubation**
- **Mark as 'No SBT' if patient is not ready for ventilator extubation**

**SBT Criteria**

- **Patient stable and ready for ventilator extubation**
- **Patient is ready for ventilator extubation**

**Compliance with SBT**

- **Percentage of patients who successfully complete SBT**
- **Percentage of patients who fail SBT**

**Complications with SBT**

- **Increased risk of ventilator-associated pneumonia**
- **Decreased lung compliance**

**Ventricilator Setup (circuit to connecting patients)**

- **Perfect tall high output (I/F, PEEP, FIO2, FiO2, resp. Atm.)**
- **Hypertensive blood pressure**
- **Gas exchange settings**

**Respirator, Endotracheal Tube & Circuit Hygiene**

- **Check cuff pressures and attachment (in and out)**
- **Check inflation of plastic bags to ensure it remains inflated**
- **Check catheter tip location**

**Ventilator Circuit configurations**

- **Check the ventilator circuit for optimal ventilation and positioning**
- **Check for any signs of infection**

**Filters**

- **Minimize bacterial contamination**
- **Minimize intravenous contamination**
- **Minimize ventilation of filters**

**Heat & Humidification**

- **Active warming**
- **Passive warming**
- **Passive humidification**

**Respiratory System Monitoring**

- **Respiratory rate**
- **Rhythm of breathing**
- **Cycle of breathing**

**Ventilation Response to Change**

- **Response to change**
- **Response to change**
- **Response to change**

**Ventilator-Related Complications**

- **Respiratory system failure**
- **Ventilator malfunction**
- **Ventilator-associated pneumonia**

**Disadvantages of Mechanical Ventilation**

- **Increased sedation and pain**
- **Decreased nutrition and physical activity**
- **Increased infection risk**

**Conclusion**

- **Mechanical ventilation is a crucial component of modern critical care**
- **Continued research and advancements in technology are essential**
- **Future improvements in ventilator design and patient care are anticipated**