**Respiratory Care Reference Pocket Guide**

### Positive End Expiratory Pressure (PEEP) (cmH₂O)
- Pressure: 0-5
- Setting: titrated based on ventilator mechanics and respiratory patient response
- Objective: reduce work of breathing and improve oxygenation.

### Pressure Regulated Volume Control (PRVC)
- Pressure regulated volume control (PRVC)
- Pressure: variable
- Flow: variable
- Mode: pressure regulated volume control
- Summary: used to deliver a set volume of gas at a consistent pressure

### Inspiratory Effort (I)
- **Peak Flow**: Highest flow achieved by expiratory effort during inspiration
- **I:E Ratio**: Peak flow divided by inspiratory flow
- **I:E Ratio of 2:1 is best for most patients**
- **Normal TI (~1-1.5s)**
- **TI too long**: Risk of barotrauma

### Pressure Support (PS)
- **Pressure Support**: Set pressure
- **Rise time**: Pressure rise time
- **Duration of breath**: Time at set pressure
- **Pinsp**: Set inspiratory pressure

### Inspiratory Time (T)
- **Normal TI (~1-1.5s)**
- **TI too long**: Risk of barotrauma

### Breathing Rate (R, bpm)
- **Normal RR**: 15-20
- **RR too high**: May lead to hyperventilation

### Volume Control (VC, mL)
- **Volume of each breath**: Set volume
- **Rise time**: Pressure rise time
- **Duration of breath**: Time at set pressure

### Respiratory Mechanics

#### Calculating Compliance (C): (cmH₂O/mL)
- **C = ΔV / ΔP = Tidal volume of breath / Pdr**
- **Target >5 mL/cmH₂O**

#### Calculating Resistance (R): (cmH₂O/L)
- **R = ΔP / ΔV = inspiratory pressure / tidal volume**
- **Target <3 cmH₂O/L**

#### Calculating Peak Flow (L/min)
- **MV = V̇/T (breaths per minute)**
- **Normal MV**: 7-10 L/min

### Other Names

#### AC-PC: Assist Control Volume Control
- **Volume Control (VC)**: (mL)
- **Controlled Variable**: PIP
- **Controlled Variables**: PIP
- **Initial Settings**: PIP 10, PEEP 5

#### AC-PC: Non-ventilator Care
- **Volume Control (VC)**: (mL)
- **Controlled Variable**: PIP
- **Controlled Variables**: PIP
- **Initial Settings**: PIP 10, PEEP 5

#### PSV: Pressure Support
- **Controlled Variable**: PIP
- **Controlled Variables**: PIP
- **Initial Settings**: PIP 10, PEEP 5

#### BTPS: Body Temperature, Pressure, and Saturation
- **Controlled Variable**: PIP
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### Other Names & Function

#### PSV: Pressure Support
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**Oxygen Sources & Delivery Devices**

**Nasal Cannulae (HC)**
- **High Flow Portion**: Fresh air with <15% N₂
- **Flow settings**: (max flow depends on cannula size; up to 60 LPM for adults and 100% FiO₂)
- **Capacity**: Able to achieve high FiO₂
- **Pros**: Requires humidification if >4LPM (risk of epistaxis); no work of breathing
- **Cons**: Requires high pressure/flow source; ~ >90% FiO₂

**Non-Rebreathing valves (HC)**
- **High Flow Portion**: >40 LPM
- **Low Flow Portion**: <4LPM
- **Pros**: Ability to achieve high FiO₂
- **Cons**: Requires high pressure/flow source; ~ >90% FiO₂

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- **High Flow Portion**: >40 LPM
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**Continuous Positive Airway Pressure (CPAP)**
- **Low flow (nose)**: 2-4 LPM
- **Low flow (mouth)**: 2-4 LPM
- **Pros**: Low work of breathing
- **Cons**: Requires high pressure/flow source; ~ >90% FiO₂

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**Choosing a Ventilator Mode**

- **Assist Control (AC)**: Allows end user to titrate to achieve a non-rebreathing baseline tidal volume or O₂ demand.
- **Pressure Support (PS)**: Allows the ventilator to deliver a portion of each breath at a set pressure, allowing for a reduction in the patient’s work of breathing.
- **Controlled Volume (CV)**: Delivers a set volume of gas at a consistent pressure.
- **Volume Control (VC)**: Delivers a set volume of gas at a set pressure.
- **Continuous Positive Airway Pressure (CPAP)**: Delivers a continuous PIP of gas without the need for a trigger or breath effort.
- **Synchronized Intermittent Mandatory Ventilation (SIMV)**: Delivers a set number of breaths at a set pressure or volume, with the option to add spontaneous breaths.
- **Synchronized Intermittentmandatory Ventilation + Pressure Support (SIMV+PS)**: Combines the features of SIMV and PS, allowing for a set number of breaths at a set pressure or volume, with the option to add spontaneous breaths.
- **Spontaneous (Spont)**: Allows the patient to control their own breathing with the support of assist or backup breaths.
- **Pressure Support with Backup (PSB)**: Allows the ventilator to deliver a set volume of gas at a set pressure, with the option to add spontaneous breaths.

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**Respiratory Pressure Support (MPR)**
- **Controlled Variable**: PIP
- **Controlled Variables**: PIP
- **Initial Settings**: PIP 10, PEEP 5

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**Designated patient effort and flow terminated (DPC)**
- **Controlled Variable**: PIP
- **Controlled Variables**: PIP
- **Initial Settings**: PIP 10, PEEP 5

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**Respiratory Failure and Supportive Ventilation (RFSV)**
- **Controlled Variable**: PIP
- **Controlled Variables**: PIP
- **Initial Settings**: PIP 10, PEEP 5

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**Respiratory Mechanics**

**Volume of each breath**: Set volume
- **Rise time**: Pressure rise time
- **Duration of breath**: Time at set pressure
- **Pinsp**: Set inspiratory pressure

**Other Names**: AC-PC, Assist Control Volume Control; CV - CV (controlled mandatory ventilation); SIMV - SIMV (controlled mandatory ventilation); SIMV+PS - SIMV+PS (controlled mandatory ventilation + pressure support); S/CMV - SP/CMV (synchronized mandatory ventilation + pressure support); B/CMV - B/CMV (burst synchronized mandatory ventilation + pressure support); SIMV+PS/CMV - SIMV+PS/CMV (synchronized mandatory ventilation + pressure support + pressure support)
Lung Protective Ventilation (LPV)

**Respiratory Care, Setup, & Monitoring**

- **Setup Prior to Connecting Patients**
  - Ensure all equipment is properly functioning and available.
  - Practice time on ventilator should be set for all patients.
  - Ventilator alarms should be set in accordance with institutional policy.
  - Ensure that the ventilator is properly connected to the power source.
  - Check for proper connection of the ventilator to the patient's devices.

**Ventilator Performance**

- **Check Adequate Sedation, then Consider Paralysis**
  - Paralysis may be considered in patients who are difficult to ventilate.
  - Paralysis may be used to prevent spontaneous ventilation.
  - Paralysis may be used to prevent agitation.

**Pulmonary, Endotracheal Tube & Circuit Hygiene**

- **Check cuff pressure and auscultate q12h to avoid over-inflation/leak**
  - Cuff pressure should be maintained at 20-30 cmH2O.
  - Auscultation should be performed to ensure no air leaks.
  - If over-inflation is suspected, deflate the cuff and re-inflate to a safe pressure.

**General Approach**

- **Stop if RASS ≥ 2**
  - RASS ≥ 2 indicates that the patient is responsive to verbal commands.
  - RASS ≥ 2 may indicate that the patient is too agitated to be ventilated safely.
  - RASS ≥ 2 may indicate that the patient is too alert to be ventilated safely.

**Additional LPV Reference Calculations**

<table>
<thead>
<tr>
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<tbody>
<tr>
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**Lung Protective Ventilation (LPV)**

- **Goal O₂ Saturation**
  - O₂ saturation should be maintained at 92-95%.
  - O₂ saturation should be maintained at 90-95% in patients with advanced disease.

**Adjunctive Therapies for ARDS Hypoxemia**

- **High recommends paralytics**
  - Paralytics should be used in patients who are difficult to ventilate.
  - Paralytics should be used in patients who are agitated.

**High Pressure**

- **High pressure**
  - High pressure may be observed with excessive spontaneous ventilation.
  - High pressure may be observed with upper airway obstruction.

**High V̇E**

- **High V̇E**
  - High V̇E may be observed with increased metabolic demand.
  - High V̇E may be observed with increased dead space ventilation.

**High ṖaCO₂**

- **High ṖaCO₂**
  - High ṖaCO₂ may be observed with excessive ventilation.
  - High ṖaCO₂ may be observed with hypoventilation.

**High ṖaCO₂**

- **High ṖaCO₂**
  - High ṖaCO₂ may be observed with hypoventilation.
  - High ṖaCO₂ may be observed with excessive ventilation.

**Low Compliance**

- **Low Compliance**
  - Low Compliance may be observed with increased airway resistance.
  - Low Compliance may be observed with increased pleural pressure.

**Low Resistance**

- **Low Resistance**
  - Low Resistance may be observed with decreased airway resistance.
  - Low Resistance may be observed with decreased pleural pressure.

**Dysynchrony**

- **Dysynchrony**
  - Dysynchrony may be observed with increased patient-ventilator asynchrony.
  - Dysynchrony may be observed with decreased patient-ventilator synchrony.

**Patient-Ventilator Dysfunction**

- **Patient-Ventilator Dysfunction**
  - Patient-Ventilator Dysfunction may be observed with excessive spontaneous ventilation.
  - Patient-Ventilator Dysfunction may be observed with hypoventilation.

**General Considerations**

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  - General Considerations may be observed with excessive ventilation.
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**V̇E**

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**SBT Solution Choices**

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**Weaning Strategies**

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**Extraction of V̇CO₂ vs V̇E**

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