



Basic Ventilator Application for the Non-Respiratory Therapist (Non-RT)

Ventilation vs Respiration

Structures and Physiology of the Airway

Respiratory Failure - Definition

Indications for Mechanical Ventilation

Invasive vs Non-Invasive Ventilation

Ventilator Settings that Require a Physician's Order

Ventilator Settings that are Set by Respiratory Therapy

Types of Positive Pressure Ventilation

Ventilator Modes - Descriptions:

- Assist Control/Volume Control (AC/VC)
- Pressure Control (PC)
- Pressure Regulated Volume Control (PRVC)
- Synchronized Intermittent Mechanical Ventilation (SIMV)
- Pressure Support
- CPAP

Application of the PMV® in the Critical Care Setting

Airway Assessment and PMV Placement on Mechanical Ventilation:

- Cuff Inflated
- Cuff Deflated
- Passy Muir[®] Valve In-Line
- Ventilator Adjustments

Alarm Settings Assessment

Suggested Ventilator Connections

Team Approach



KEY POINTS/NOTES





Modes of Ventilation - Method or way a breath is delivered

Control mode

Every breath delivered to patient is a mechanical breath. The breath may be triggered by a timing mechanism or patient effort. May be volume or pressure controlled. Examples: AC, VC/IMV, PC/IMV, PRVC.

Supported or spontaneous mode

Every breath is spontaneous, patient triggered, and supported by ventilator. Examples: PS, CPAP

Combination mode

Combination of both controlled and supported breaths. Example: SIMV/PS is a combination of a set number of volume controlled breaths and pressure supported breaths.

VC/AC Volume Control/Assist Control - the ventilator is set to deliver a specific volume each breath, regardless of the amount of pressure required to deliver the volume. The clinician can set a high-pressure limit.

SIMV Synchronized Intermittent Mandatory Ventilation – tidal volume and rate are set, but the ventilator senses patient effort and "reschedules" mandatory (set) breaths.

PS **Pressure Support** is a patient-initiated breathing mode in which the ventilator supports patient effort. Provides a set amount of pressure during inspiration to help patient draw in a spontaneous breath. The patient regulates the breath rate. The inspiratory time and/or volume of each breath may vary.

PC Pressure control is an alternative to volume control. A pressure level is preset. Breaths are delivered at a preset frequency rate and inspiratory time. Pressure is constant throughout the delivered breath. Tidal volume can be variable. Patient can breathe above set rate.

PEEP Positive End Expiratory Pressure maintains small end-expiratory pressure to help prevent alveolar collapse and improve oxygenation. Patients are often started on 5 cmH₂O of PEEP.

CPAP Continuous Positive Airway Pressure is positive pressure maintained in the airway to prevent alveolar collapse, but is generally used to describe positive pressure set in spontaneous mode.

Settings - In addition to the mode of ventilation, the following are physician ordered and/or set by the clinician.

 V_T **Tidal Volume** - Volume of air delivered per breath. Pressure to deliver the breath may vary depending on lung mechanics.

RR/F **Respiratory Rate/Frequency** – Set frequency of ventilator delivered breaths per minute.

I-Time Inspiratory Time, expressed in seconds, is the amount of time spent in inspiration during the total respiratory cycle. Example: RR is 12, total cycle time is 5 seconds (60/12 = 5 seconds). If I-Time set at 1 second, then 1 second is spent in inspiration, 4 seconds are available for exhalation.

FI02 **Fraction of Inspired Oxygen** – The amount of oxygen the ventilator delivers, expressed as a percentage. Room air is 21%.

Sensitivity

The level of effort from the patient needed to "trigger" the ventilator to deliver a breath from the ventilator. Increase sensitivity to decrease patient effort.

