



Modes of Ventilation - Method or way a breath is delivered

Control modes

Every breath delivered to patient is a mechanical breath, full ventilatory support. 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. Also called Continuous Mandatory Ventilation (CMV).

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.

Supported or spontaneous mode

Every breath is spontaneous, patient triggered, and supported by ventilator. *Examples:* PS, CPAP. No mandatory breath type or rate.

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.
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.
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.
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. Ventilator measures inspired volume (V_{Ti}) and exhaled volume (V_{Te}).
RR/F	Respiratory Rate/Frequency – Set number 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. <i>Example:</i> 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.
FI_{O_2}	Fraction of Inspired Oxygen – The amount of oxygen the ventilator delivers, expressed as a decimal ($FI_{O_2} = .50$ or oxygen is 50%). Room air is 21% oxygen.
IP	Inspiratory Pressure - Can be set when using PC breathes. Measured on every breath. It is the pressure used to deliver the V_t .
PIP	Peak Inspiratory Pressure - Maximum pressure in the airways at the end of the inspiratory phase. The PIP is the sum of the Positive End-Expiratory Pressure (PEEP) plus the IP.
PEEP	Positive End Expiratory Pressure maintains small end-expiratory pressure to help prevent alveolar collapse and improve oxygenation. Patients are often started on 5 cmH ₂ O of PEEP but increased if the lungs are sicker and need more support.
	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.

