Ventilators 102: Modes of Mechanical Ventilation:

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After knowing what types of breaths a ventilator will provide a patient, the modes of ventilation will make more sense. There are many modes of ventilation so we’ve included a list of the most commonly used ventilator modes.

There are two main types of ventilation you will see. You will see volume support and pressure support ventilation. Volume ventilation is when the volume of oxygen is the same for every breath provided to your patient (Kallet et al., 2000). Pressure ventilation is when the pressure provided is constant but the amount of oxygen delivered to your patient is variable (Kallet et al., 2000).

A rule of thumb is the higher the pressure the sicker the lungs are. There are many different ventilation modes that you will see a patient placed on, again these are chosen based on their individual needs. To the right is a list of the most common ventilator modes and descriptions of what that mode is responsible for.

Commonly Used Modes of Mechanical Ventilation

Controlled Modes:

- Controlled Mechanical Ventilation (CMV):
  - There is full ventilator support - the ventilator is doing all of the work of breathing (Wilcox et al., 2018).

- Volume Control (VC):
  - The volume of each breath is pre-set and completely controlled by the ventilator (Wilcox et al., 2018).

- Pressure Control (PC):
  - The pressure of oxygen delivery is controlled and the ventilator achieves a pressure and maintains it throughout the breath with a set rate. The amount of oxygen delivered is variable (Wilcox et al., 2018).

- Pressure Regulated Volume Control (PRVC):
  - The ventilator adjusts the pressure of oxygen delivered during each breath to ensure a target lung volume is met (Wilcox et al., 2018).

Supported (Spontaneous) Modes:

- Assist Control (AC):
  - The ventilator assists the patient by delivering support for every breath they take and the ventilator will take over if the respiratory rate goes below a predetermined rate (Wilcox et al., 2018).

- Continuous Positive Airway Pressure (CPAP):
  - This is setting often used prior to liberation from ventilation support. The patient determines how many breaths per minutes they take but they are given a continuous positive air pressure (Wilcox et al., 2018).

- Intermittent Mandatory Ventilation (IMV) and Synchronized Intermittent Mandatory Ventilation (SIMV):
  - The ventilator delivers breaths at a set rate and volume that is synchronized to the patient's effort.

- Pressure Support Ventilation (PSV):
  - The ventilator assists the patient's own spontaneous effort to breathe with a mechanical breath with a preset pressure limit. This is an assisted breath support (Wilcox et al., 2018).

- Volume Support (VS):
  - The ventilator adapts the inspiratory pressure level, breath by breath, to changes in the patient's inspiratory effort in order to maintain a consistent inspiratory volume.

- Neurally Adjusted Ventilatory Assist (NAVA):
  - A mode of ventilation in which the patient's diaphragmatic activity determines the amount of assist that the ventilator will provide (Yonis, et al., 2015).

Combination Modes:

- Synchronized Intermittent Mandatory Ventilation (SIMV) (Volume Controlled) + Pressure Support (PS):
  - The ventilator provides pressure-controlled breaths when the patient does not breathe on their own and provides pressure support for spontaneous breaths.

- Synchronized Intermittent Mandatory Ventilation (SIMV) (Pressure Controlled) + Pressure Support (PS):
  - The ventilator provides pressure-controlled breaths when the patient does not breathe on their own and provides pressure support for spontaneous breaths.

- Bi-level Ventilation (Biphasic) and Airway Pressure Release Ventilation (APRV):
  - Bilevel ventilation and APRV are essentially two levels of continuous positive airway pressure that allow a mixture of spontaneous and ventilator-mandated breaths. The rate of breathing is patient dependent. Again, this is an assisted breath support (Wilcox et al., 2018).
References:


