

Practice Pointers

Standard Versus Alternative Ventilator Modes: What's the Difference?

Is pressure control ventilation, especially airway pressure release ventilation, advantageous in the setting of acute respiratory distress syndrome (ARDS)?

Pressure control ventilation and airway pressure release ventilation, a form of pressure control ventilation, have similar breath delivery patterns (square wave) that allow for early and sustained achievement of the set inspiratory pressure until exhalation. This breath pattern combined with inverse ratio (short expiratory time) can recruit the significant alveolar collapse associated with ARDS.

What evidence is there to support the use of neurally adjusted ventilatory assist (NAVA) or proportional assist ventilation (PAV)?

Both PAV and NAVA are modes that provide ventilator support in proportion to the patient's effort. These modes are designed to be more responsive to the patient in triggering the supported breath. Most of the evidence is in improved patient-ventilator synchrony over pressure support ventilation. Both PAV and NAVA are limited to only a few manufactured machines.

Can you explain pressure-regulated volume control and the patients who would benefit from this mode of ventilation?

Pressure-regulated volume control is a dual-control or volume-targeted pressure mode. In switching from standard volume control ventilation to a dual-control mode, the target tidal volume can often be achieved at a lower inspiratory pressure. The machine optimizes the delivery of the set targeted tidal volume by evaluating the lung dynamics breath-to-breath and alters the flow of gas to deliver the desired tidal volume within the desired pressure target.



What is the relationship between plateau pressure and peak inspiratory pressure (PIP)?

Peak inspiratory pressure is the highest pressure achieved during breath delivery. The plateau pressure is usually lower than PIP and is measured during an inspiratory hold maneuver. The plateau pressure approximates alveolar pressure. Elevations in plateau pressure above 30 cm H₂O signal alveolar pressures that may be injurious. When the PIP is high (eg, 50 cm H₂O), with a plateau that is also elevated but within 10 cm H₂O of the PIP (eg, 44 cm H₂O), we may infer that the elevated PIP and plateau are related to a lung compliance issue (eg, ARDS, pulmonary edema, atelectasis, tension pneumothorax). In cases of increased airway resistance, where PIP is high and plateau pressure is lower (usually >10 cm H₂O difference), the elevated PIP is related to airway resistance (eg, bronchospasm, mucous plugging). It is important to measure the PIP and plateau pressure, as well as evaluating the relationship between them. CCN

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AACN webinars include answers to audience questions, and the presenter provides written answers to the questions that are not answered during the live presentation. This feature is an excerpt of answers provided for the webinar on alternative ventilator modes, presented by John Gallagher, DNP, RN, CCRN-K, CCNS, TCRN, RRT, in September 2018. The webinar and all the questions and answers are available at <https://www.aacn.org/education/webinar-series/wb0053/standard-vs-alternative-vent-modes-whats-the-difference>.