

OPERATING MODES OF MECHANICAL VENTILATION

There are at least 23 modes of ventilation available in different ventilators. Two or more of these modes are often used together to achieve certain desired effects. For example, spontaneous plus PEEP is the same as CPAP, and it is used to oxygenate a patient who has adequate spontaneous ventilation. SIMV may be used with PSV to provide mechanical ventilation and reduce the work of spontaneous breathing.

1. Spontaneous
2. Positive end-expiratory pressure (PEEP)
3. Continuous positive airway pressure (CPAP)
4. Bilevel positive airway pressure (BiPAP)
5. Controlled mandatory ventilation (CMV)
6. Assist/control (AC)
7. Intermittent mandatory ventilation (IMV)
8. Synchronized intermittent mandatory ventilation (SIMV)
9. Mandatory minute ventilation (MMV)
10. Pressure support ventilation (PSV)
11. Adaptive support ventilation (ASV)
12. Proportional assist ventilation (PAV)
13. Volume-assured pressure support (VAPS)
14. Pressure-regulated volume control (PRVC)
15. Adaptive pressure control (APC)
16. Volume ventilation plus (VV1)
17. Pressure-controlled ventilation (PCV)
18. Airway pressure release ventilation (APRV)
19. Biphasic positive airway pressure (Biphasic PAP) 20. Inverse ratio ventilation (IRV)
21. Automatic tube compensation (ATC)
22. Neurally adjusted ventilator assist (NAVA)
23. High-frequency oscillatory Ventilation (HFOV)

SPONTANEOUS

Spontaneous setting on the ventilator is not an actual mode since the frequency and tidal volume during spontaneous breathing are determined by the patient. The ventilator simply provides the flow and supplemental oxygen. Even though the spontaneous mode is not a direct ventilator function, the role of the ventilator during the spontaneous mode is to provide the (1) inspiratory flow to the patient in a timely manner, (2) flow adequate to fulfill a patient's inspiratory demand (i.e., tidal volume or inspiratory flow), and (3) adjunctive modes such as PEEP to complement a patient's spontaneous breathing effort.

Apnea Ventilation

Apnea ventilation is a safety feature incorporated with the spontaneous breathing mode. In the event of apnea or an extremely low frequency, backup ventilation is invoked by the apnea ventilation feature and it delivers a predetermined tidal volume, frequency, FIO₂, and other essential ventilator functions to the patient.

REFERENCES

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