Table 5: Advantages and Disadvantages of the Different Commonly Used Ventilator Modes

Mode	Advantages	Disadvantages	Appropriate Clinical Circumstances	Inappropriate Clinical Circumstances
Assisted mechanical ventilation (AMV) or assist/control (A/C)	Can respond to increased need for ventilation by increasing machine rate; decreased oxygen consumption in patients with high work of breathing as compared with low-rate IMV or spontaneous breathing	Higher mean intrathoracic pressure than with modes providing partial ventilatory support; respiratory alkalosis in dyspneic or agitated patients if inspiratory flows and/or sedation insufficient	Any patient requiring mechanical ventilation; increased work of spontaneous breathing, as in high minute ventilation or small endotacheal tube; depressed or fluctuating ventilatory drive	Respiratory alkalosis unresponsive to ventilator adjustment and/or sedation; use with Siemens Servo 900C ventilator in dyspneic patient with normal or low minute ventilation (insufficient flow during inspiration)
Controlled mechanical ventilation (CMV)	Decreased oxygen consumption in patients with high spontaneous work of breathing; rests ventilatory muscles; least complicated and least expensive mode for long-term ventilation	Cannot respond to increased need for ventilation by either machine-delivered or spontaneous breaths; patient distress if alert and dyspneic; usually requires heavy sedation with or without paralysis; ventilatory muscle dysfunction or atrophy with prolonged use (unproven)	Paralysis or neurologic injury rendering patient incapable of any spontaneous ventilation; deliberate hyperventilation to reduce intracranial pressure	Any patient who is capable of triggering a ventilator breath
Intermittent mandatory ventilation (IMV); synchronized intermittent mandatory ventilation (SIMV)	May reduce patient-ventilator asynchrony; lower mean intrathoracic pressure than with AMV if used for partial ventilatory support; can provide periodic deep breaths to prevent atelectasis in intubated patients with very low spontaneous tidal volumes	Cannot respond to increased patient demand with increased ventilator minute volume; increased work of breathing for patient as compared with AMV when used for partial ventilatory support; may decrease total time on ventilator when used for gradual weaning	Any patient requiring invasive mechanical ventilation provided inappropriate circumstances shown at right are not present; use for partial ventilatory support in patients with hypovolemia and hypotension on AMV; as an alternative volume-targeted mode when patients do not tolerate AMV	Use as partial ventilatory support in patients with depressed or fluctuating ventilatory drive, ventilatory muscle paralysis or weakness, or in the presence of a small-diameter endotracheal tube

Table 5, continued:

Pressure support ventilation (PSV)	Increased peak inspiratory flow as compared to volume modes; lower mean intra-thoracic pressure than with AMV or IMV; less distressing than volume-preset modes for some patients; can provide smooth transition to spontaneous ventilation during weaning	Tidal volume and minute ventilation are not assured; hypoventilation or apnea if patient's ventilatory drive fluctuates; requires closer monitoring of gas exchange and mechanics in critically ill patients than AMV or IMV; repeated triggering of apnea alarm in patients with Cheyne-Stokes respiration	As a stand-alone mode for patients with intact ventilatory drive who require modest inflation pressures; as a transitional mode during recovery from severe ARDS or other acute respiratory failure; during weaning in any patient in whom decreasing the level of ventilatory support is appropriate	Absent or fluctuating ventilatory drive; rapidly changing lung or chest wall mechanics (e.g. bronchospasm; pulmonary edema) because of need for repeated pressure adjustments
Pressure control ventilation (PCV)	Increased peak inspiratory Flow as compared to volume Modes; improved distribution of ventilation in some patients with severe oxygenation failure failure, resulting in improved oxygenation and/or decreased alveolar pressure in comparison with AMV or IMV	Tidal volume and minute ventilation are not assured; requires closer monitoring of gas exchange and mechanics than AMV or IMV; need to switch to another mode for weaning	Critically ill patients with ARDS or other severe acute respiratory failure when appropriate skilled personnel are continuously available	Use for routine ventilatory support; use in any patient when personnel experienced with its use are not available on a continuous basis