SUMMARY

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Mechanical ventilation has been used as a supportive therapy in essential care of critically ill patients, since the incepts of mechanical ventilation there has been considerable progresses in the modes of ventilation that has been identified with the development of critical care units more than any other technological advance.

While factors to the decision to initiate therapy are relatively uniform, the specific modes to be chosen vary, depending on the nature of the patients problem, local practice and physician perception. The recent addition of new modes emphasize the ongoing quest for improving patient's outcome through applied physiology. Indications of artificial ventilation include respiratory failure in the form of hypoxemia and or hypercarbia. In addition, mechanical ventilation is often initiated or continued as mean of physiologic support in critically ill patients for example in case of cardiovascular collapse, sepsis or multiple organ failure.

Since potential damage to lung tissue and cardiovascular embarrassment were known to result from conventional modes of ventilation. New modes of ventilation were designed to assure adequate ventilation in different situation with minimal complications. Each of these modes has a specific advantage they include:

a- Synchronized intermittent ventilation (SIMV): it include a continuous flow system that allows the patient to spontaneously breath between the positive-pressure breaths.

b- Pressure support (PS): this spontaneous mode is used alone or in combination with SIMV as a mode of weaning.

c- High frequency ventilation (HFV): that can be useful in certain situations as example difficult airway management, procedures involving upper airway. Adult and infant respiratory distress syndrome.

d- Inverse-ratio ventilation: the lower peak airway pressure in this mode may reduce the risk of barotrauma. Inverse I : E ration achieves better oxygenation. This mode is preferred in ARDS and pulmonary edema.

e- Airway pressure-released ventilation: which is a form of pressure present ventilation in which the lung is allowed to deflate to ambient pressure passively, as APRV maintains an increased FRC throughout most of ventilatory cycle arterial oxygenation is better maintained.

f- Differential lung ventilation: that have revolutionized the approach, to mechanical ventilatory support, to patient with asymmetrical lung injury.

g- Non-invasive positive airway pressure: has been designed to provide partial non-invasive pressure support. It can be defined s pressure controlled ventilation, in a system allowing unrestricted spontaneous breathing at any moment of the ventilatory cycle.

h- Positive and expiratory pressure (PEEP): that can be used during controlled or spontaneous ventilation, increases the functional residual capacity till the upper border of alveolar expansion is reached. Continuous positive airway pressure (CPAP) refers to application of positive airway pressure throughout the entire respiratory cycle, during spontaneous ventilation. In can be also used with modes such as IMV/SIMV. Positive airway pressure is beneficial because arterial oxygenation is improved with a reduction in oxygen requirements.

Complications are undesirable consequences of therapy directly leading to increased morbidity and mortality, first complications of tracheal intubation second complications of mechanical ventilation itself.

Knowledge about new modes of ventilation allow utilization of the proper mode in the proper situation and so minimizing complications resulting from artificial ventilation.