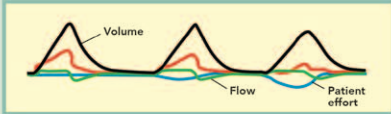


ANESTHESIOLOGY



Unconventional Ventilation: High Frequency Oscillatory Ventilation & Adaptive Support Ventilation

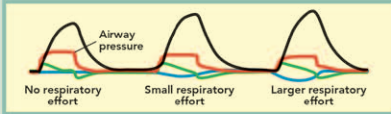
During **conventional ventilation** tidal volume and rate are set, while inspiratory pressure is monitored...



Variable pressure

$V_t \times RR = MV$

...or inspiratory pressure and rate are set while tidal volume is monitored. Patient effort increases tidal volume.

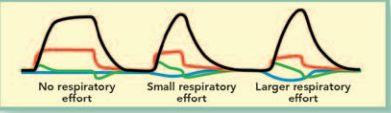


Set pressure

$V_t \times RR = MV$

Both modes require clinician adjustment of ventilation with this open loop design.

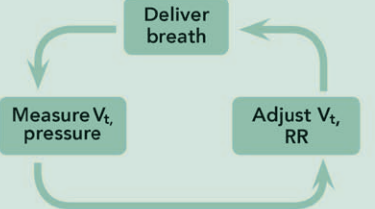
In **adaptive support ventilation**, a minute ventilation is targeted...



Variable pressure

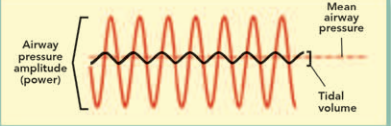
$V_t \times RR = MV$

...and tidal volume and rate are adjusted to minimize work of breathing, with automated adjustments via closed-loop design.



Recent data have shown that this ventilation mode may lead to earlier extubation.¹

High frequency oscillatory ventilation uses small tidal volumes at high frequency to facilitate gas exchange. Mean airway pressure and frequency are set as the primary parameters.



Frequency
Mean airway pressure

While this approach improves oxygenation and is used as a rescue technique, it does not improve outcomes in ARDS.²

oxygenation

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Infographic created by Jonathan P. Wanderer, Vanderbilt University School of Medicine, and James P. Rathmell, Massachusetts General Hospital/Harvard Medical School. Illustration by Annemarie Johnson, Vivo Visuals. Dr. Wanderer is funded by the Foundation for Anesthesia Education and Research, Rochester, Minnesota, and the Anesthesia Quality Institute's Mentored Research Training Grant in Health Services Research, Schaumburg, Illinois. Address correspondence to Dr. Wanderer: jon.wanderer@vanderbilt.edu

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