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Assist-Control Ventilation (Part 1 of 4)

- Assist-Control (A/C) is a mode of mechanical ventilation that offers a set inspiratory flow rate and terminates once the set tidal volume has been delivered.
- Tidal volume is the same for each breath
- Can be patient-initiated (based on negative airflow pressure) or ventilator-initiated (based on RR)
- Delivered airway pressure is based on airway resistance, lung compliance, and chest wall compliance
- Other terms given to A/C are: volume-targeted, volume control, volume-limited
- Tends to provide more support than other modes (i.e., SIMV, pressure)

When to Use:

- When looking for reduced work of breathing
- When patient exhibits a reduced drive to breathe (possibly due to sedation, paralysis, or etc.)
- When looking for a set tidal volume

Clinician to set:

- peak flow rate
- flow pattern
- tidal volume
- respiratory rate
- positive end-expiratory pressure (applied PEEP)
- fraction of inspired oxygen (FiO₂)

Limitations:

- Hyperventilation and respiratory alkalosis due to tachypnea if flow rate set too high
- Dysynchrony between patient breaths and machine leading to increased effort if flow rate is set too low for the patient
- Breath stacking can occur if patient initiates a second breath before the first one is completely exhaled
- Pressure is not adjustable

Initial settings:

- 6mL/kg
- 12-16 bpm
- PEEP of 5-10cm
- I:E of 1:2 to 1:3

References:

1. Courey, A. & Hyzy, R. (2013). *Overview of mechanical ventilation*. Retrieved June 30, 2013 from www.uptodate.com
2. Grossbach, I., Chlan, L., & Tracy, M.F. (2011). Overview of Mechanical Ventilatory Support and Management of Patient-and Ventilator-Related Responses. *Critical Care Nurse 31*, 30-44. Doi: 10.4037/ccn2011595
3. Hyzy, R. (2013). *Modes of mechanical ventilation*. Retrieved June 30, 2013 from www.uptodate.com
4. Singer, B. & Corbridge, T. (2009). Basic Invasive Mechanical Ventilation. *Southern Medical Journal 102*(12), 1238-1245. Retrieved July 15, 2013 from www.medscape.com