Automatic Transport Ventilators for EMTs, EMT-Is and AEMTs

2011 Georgia Office of EMS Updates

2011 Georgia Scope of Practice

3.	Ventilation management					
	a. mouth to barrier devices	E	I	A	C	P
	b. bag-valve-mask	E	I	A	C	P
	c. manually triggered ventilators	E	I	A	C	P
	d. automatic transport ventilators	E*	I*	A*	C	P
	e. chronic-use home ventilators	E	I	A	C	P

EMTs, EMT-Is and AEMTs are limited to the initiation during resuscitative efforts of ventilators that only adjust rate and tidal volume.

Automatic Transport Ventilator

- Designed for convenience and easy use
  - Lightweight
  - Durable
- Run off portable oxygen supply
- Control of:
  - Ventilatory rate
  - Tidal volume
- Pop-off valve to control pressure
  - Hindrance in cases where high airway pressures desirable
    - ARDS
    - Cardiogenic pulmonary edema

Indications for Ventilator Use

- For EMTs, EMT-Is, and AEMTs
  - Resuscitative Efforts!
    - Only can adjust rate and tidal volume
    - *For ventilators (like the Autovent) that have an inspiratory time setting (for Adult vs. Child), this is also acceptable to adjust.*

ATV - Contraindications

- Contraindications
  - Airway obstruction
  - Resistance
  - Poor lung compliance
  - Pneumothorax - tension pneumothorax
  - Pulmonary over-pressurization (blast injury, water ascent injury, etc.)
  - *Children less than 5 years of age (check manufacturer's recommendations)*

ATV – Advantages/Disadvantages

- Advantages
  - Lightweight/portable/durable
  - Oxygen-enriched mixture
  - ET tube or other rescue airway device
  - Frees rescuer, adjustable settings
- Disadvantages
  - Needs oxygen source
  - Unable to detect increasing airway resistance
  - Hard to secure
  - Reliance on oxygen tank pressure
  - Some cannot be used in < 5-year-olds

EXAMPLES OF VARIOUS VENTILATORS

AutoVent

AutoVent 2000

AutoVent 3000

CAREvent

Uni-Vent

Pneupac VR1

2010 AHA Guidelines

- RATE:
  - Ventilations with advanced airway (HCP)
    - 1 breath every 6–8 seconds (8–10 breaths/min)
    - About 1 second per breath
    - Visible Chest Rise
- **TIDAL VOLUME:**
  - "Give a sufficient tidal volume to produce *visible chest rise*"
  - "during adult CPR tidal volumes of approximately 500 to 600 mL (6 to 7 mL/kg) should suffice. This is consistent with a tidal volume that produces visible chest rise."
  - Children – Tidal volume sufficient to make the chest rise.

SOURCE:
http://circ.ahajournals.org/content/122/18_suppl_3/S676.full.pdf+html

Procedure – Part 1

- Determine that a need for the use of the ATV exists. (resuscitation efforts only in GA)
- Assure that all tubing is free from kinks.
- Determine the proper tidal volume setting. This is done by determining the patient ideal weight (approx. weight for any physically fit patient having the same sex, height, frame) and multiplying it by 6-7 ml./kg. Begin with the lowest tidal volume limit. (Based on AHA guidelines and medical control)
- Set Breaths per Minute (BPM) control to rate of 8-15 per minute. (Based on AHA guidelines and medical control)
- Assess lung compliance and chest rise with a bag valve device. Tidal volume may be adjusted lower if poor lung compliance is found.

Procedure – Part 2

- Attach the patient valve assembly to the airway device or mask used on the patient.
- Assess the ventilation. Listen for bilateral lung sounds. Observe for proper chest rise . . . this should look normal and be symmetrical.
- Count the number of complete ventilator cycles for a full minute. The number should be the same as the setting (+/-1). (in other words – verify the rate)
- Assess and manage the airway as you normally would for any patient with controlled ventilation.
- If spontaneous breathing begins, it may be desirable to turn the BPM down as long as patient's spontaneous rate is 10-12 per minute. (i.e. ROSC – consult medical control)
- Check oxygen cylinder pressure level frequently. These devices will deplete a "D" cylinder rapidly.

Special Considerations

- Due to COPD, chest rise may not appear full . . . do not increase tidal volume (TV) past upper TV limit.
- If lung sounds are absent or on one side only: rule out airway obstruction, improper tube placement, or pneumothorax, and check tidal volume ml/bpm settings.
- If chest expansion is not adequate, the rescuer should slowly increase tidal volume until chest expansion is adequate, or the uppermost limit (for the patient's ideal weight) is reached.
- If chest appears to over expand, decrease tidal volume.

Using DOPE to figure out Problems

- D – dislodgement
- O – obstruction
- P – pneumothorax
- E – equipment failure

THE END!