Z Vent

Procedure

Douglas County KS EMS System **March 2022**

Approved Provider: AEMT, Paramedic

Reference Protocols: Breathing Difficulty, Interfacility Transfers

Indications

- Primary CPAP delivery method
- AC mode only for Interfacility transfers

Contraindications

- Ventilators are currently contraindicated for use on scene/transport from scene unless used for CPAP (Rollout of BL later in 2022)

Precautions

- Do not use CPAP or BL modes unless patient is breathing independently
- Do not connect patient to ventilator until you have confirmed appropriate mode and setting are in place
- Never start ventilator with patient connected

Procedure CPAP

- Turn Ventilator on
- Scroll down to mask CPAP and select using green check
- Apply ETCO2 Nasal cannula
- Apply facemask and connect tubing to ventilator
- Adjust FIO2 based on SPO2 saturation and O2 availability (21-100)
- Adjust PEEP based on lung sounds and patient condition (5-15)
- BPM (breaths per minute) and VT are patient dependent as the pt is breathing themselves
- Reevaluate the patient often and adjust accordingly

Procedure Ventilation (Fig.1)

- Turn ventilator on
- Select appropriate patient (Adult or Ped)
- Ensure mode is set to "AC" (Default is AC Volume but can be changed to pressure if needed)
- Set FIO2 based on RT or patient (21-100%)
- Set BPM based on RT or patient condition (12-20)
- Set tidal volume based on ideal body weight chart or RT (Fig. 1)
- Set PEEP based on RT or patient condition (Defaults to 5)
- Set I:E ratio based on RT or patient condition (Defaults 1:3)
- Set trigger based on RT or patient condition (Defaults to -2) (-0.5 to -6.0)
- Confirm settings with RT prior to transferring patient to our ventilator
- Confirm sedation with MD
    - Confirm what MD wants provider to do if increased sedation is required
- Confirm settings with RT prior to leaving with patient
- ☎ Call LMH if provider needs guidance in transport

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Complications

- Lung trauma
- Death

Abbreviations

- **"BPM"** Breaths per minute
- **"BL"** Bi-level positive airway pressure (think BIPAP)
- **"FIO2"** Fraction of inspired oxygen
- **"I:E"** Inspiratory/expiratory ratio
- **"LC"** Leak compensation
- **"PEEP"** Positive end expritory pressure
- **"PIP"** Peak inspiratory pressure
- **"PS"** Pressure support
- **"Ti"** Inspiratory time
- **"VT"** Tidal Volume
- **"Vmin"** Minute volume

Modes

- AC (Assist/Control)
    - Patient is ventilated mechanically and can breathe spontaneously based on trigger setting
    - AC pressure mode allows the provider to control the pressure of the ventilations. Volume is not able to be controlled directly
    - AV volume mode allows the provider to control the tidal volume. Pressure is not able to be directly controlled.
- CPAP (Continuous Positive Airway Pressure)
    - Provides continuous pressure to support ventilations. CPAP with Z Vent does not require O2 but can be adjusted with FIO2 setting.
    - LC (Leak Compensation) can either be on or off. When LC is on the ventilator will supply more pressure to compensate for a leak
- BL (Bi-Level Positive Airway pressure)
    - The ventilator provides two pressure settings to assist patients breathing spontaneously: a higher inspired pressure (IPAP) and a lower expiratory pressure (EPAP)

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Main Settings

- FIO2
  - Adjust between 21% and 100% based on SP02
- PIP
  - Adjust up if in pressure mode to increase inspiratory pressure if patient is constricted and requires more pressure to ventilate appropriately
- PEEP
  - Adjust up to increase baseline pressure in the lungs to help keep alveoli open and push fluid out
- Trigger
  - Adjust down to decrease sensitivity and make it harder for the patient to breathe independently (or if the road is bumpy causing false breaths)
  - Adjust up to increase sensitivity and make it easier for the patient to breathe independently
  - More negative makes it harder for the patient to pull a breath
- VT
  - Adjust up or down when in volume mode based on ideal body weight chart (Fig.1) or based on RT
- BPM
  - Adjust up or down to increase or decrease breathing rate
- I:E
  - Adjust up to decrease expiratory time and down to increase expiratory time

Troubleshooting

- Alarms will show on screen
  - Troubleshoot from patient to machine
  - Alarm color indicates severity with red being severe

Documentation

- Indications for procedure
- Description of procedure
- Response to procedure

Notes

- "Solid" numbers can be changed
- "Hollow" numbers cannot be changed and are patient or setting dependent
- Diagnose your patient not the ventilator.

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Fig. 1

Ideal Body Weight									
For Males					For Females				
Height	Pounds	Kilos	Vt 6ml/kg	Vt 8ml/kg	Height	Pounds	Kilos	Vt 6ml/kg	Vt 8 ml/kg
5'-0"	108	48	288	384	4'-8"	80	36	216	288
5'-1"	112	51	306	408	4'-9"	85	38	228	304
5'-2"	118	54	324	432	4'-10"	90	41	246	328
5'-3"	124	58	348	464	4'-11"	95	43	258	344
5'-4"	130	59	354	472	5'-0"	100	45	270	360
5'-5"	136	62	372	496	5'-1"	105	48	288	384
5'-6"	143	64	384	512	5'-2"	110	50	300	400
5'-7"	148	67	402	536	5'-3"	115	52	312	416
5'-8"	154	70	420	560	5'-4"	120	54	324	432
5'-9"	160	72	432	576	5'-5"	125	57	342	456
5'-10"	166	75	450	600	5'-6"	130	59	354	472
5'-11"	172	78	468	624	5'-7"	135	61	366	488
6'-0"	178	81	486	648	5'-8"	140	63	378	504
6'-1"	184	83	498	664	5'-9"	145	66	396	528
6'-2"	190	86	516	688	5'-10"	150	68	408	544
6'-3"	196	89	534	712	5'-11"	155	70	420	560

Males wt in kg = 50 + 2.3[height(inches) -60]

Females wt in kg= 45.5 + 2.3[height(inches) -60]