

Using The MetaNeb™ System

In-Line with a Ventilator

The MetaNeb™ System can be safely incorporated into a ventilator circuit in order to provide therapy with most ventilators. By simply utilising the following components, Continuous High Frequency Oscillation (CHFO) therapy can be administered to a ventilated patient without breaking the circuit:

- Spring-valve tee (normally used for in-line nebulizer treatments)
- 15 mm x 22 mm adaptor (included in The MetaNeb™ System circuit)
- Black occlusion ring (also included with the circuit) to replace the blue selector ring.



When the MetaNeb™ System is placed in-line with a ventilator, both flow and volume are added to the circuit. Based upon an independent lab study, the following are results one may see when adding the MetaNeb™ System to a ventilator circuit:

1. **Tidal volume and minute volume measurements may be skewed.** Most ventilators calculate volumes based on measured flow. Since flow transducers are unable to read the relatively continuous flow added to the circuit, it is common to see distorted tidal volume measurements register on the ventilator. Actual delivered volumes when measured on a test lung are close to the set volume on the ventilator.

The entrainment ports on the handset, which are always open to atmosphere, release excess volume added by the MetaNeb™ System while still allowing the oscillatory effect of the therapy.

2. **Peak Inspiratory Pressure (PIP) measurements may appear elevated.** Peak pressures are measured from a port located between the MetaNeb™ System and the patient, which may cause PIP to appear elevated. Actual delivered peak pressures measured at the patient are likely to be comparable to peak pressures without the MetaNeb™ System.

The entrainment ports on the handset serve as a pressure release outlet, and help compensate for the added flow to the circuit.

3. **Auto-cycling may occur for pressure or flow triggered breaths.** As additional pulsatile flow and pressure from the MetaNeb™ System enters the circuit, the ventilator may respond as though a patient is initiating a breath. This is called "auto-cycling." To avoid auto-cycling, it may be necessary to raise the breath trigger threshold points.

Recommendations

In order to accommodate the added flow, volume and pressure when putting the MetaNeb™ System in-line with a ventilator, one should:

- Set up in-line on a test lung prior to using on a patient
- Raise tidal volume and minute volume alarms
- Set flow and pressure breath triggers to higher thresholds
- Adjust pressure alarms
- Remember to return the ventilator settings and alarms to previous settings after use

For complete setup instructions refer to the MetaNeb™ System User Manual.

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