

# ASL 5000™

## End Users and Training Applications



## Who Gets Ventilation Training?

- Respiratory Therapists
- Pulmonologists
- Anesthesiologists
- Neonatologists
- Intensivists
- Critical Care Physicians
- Emergency Medicine Physicians
- Nurses (ICU, ER)
- Nurse Anesthetists
- Nurse Practitioners
- EMT/ Paramedics
- Physiotherapists
- Physician Assistants
- Perfusionists

## What Are Some Common Ventilation Training Topics?

### **Patient-Ventilator Interactions (including but not limited to)**

- Patient-ventilator synchrony issues/Flow starvation or air hunger
  - Inspiratory
  - Expiratory
  - Cycle
  - Missed triggers or missed breath
  - Reverse triggering
- Breath stacking
- AutoPEEP/air trapping
- Patient "fighting the ventilator"
- Observe the impact of external leaks on patient-ventilator interaction
  - Cuff leak
  - Circuit leak
- Impact of alarm limits on patient-ventilator interaction
- Change of patient's airway resistance as a result of drug delivery
- Observe impact of patient's spontaneous effort which triggers the ventilator
  - Negative deflection in flow or pressure waveform consistent with a patient's spontaneous breath
  - Total RR is higher than set rate
  - Change in pressure or volume from set values
- Trigger ventilator with very small spontaneous tidal volumes (less than 5 mL)
- Trigger ventilation with very large spontaneous tidal volumes (up to 2.5 L)
- Trigger ventilator while using any sensitivity
- Provoking and/or resolving alarms
  - High peak pressure

- Low or high minute ventilation
- Low or high exhaled tidal volume
- Circuit disconnect
- Observe F/V and P/V Loops
- Observe realistic changes in mean pressure
- Management of
  - Lung protective strategies
  - Protocol integration
  - Severe respiratory failure

### **Ventilator Adjustments**

- Make changes to any ventilator setting during simulation (Rate, Vt, Flow, Inspiratory time, etc.)
- Switching from any mode to another during the simulation
- Setting alarm limits
- Using PEEP (including values > 20 cmH<sub>2</sub>O)
- Spontaneous breathing trials (SBT) or ventilator weaning

### **Ventilator Maneuvers**

- Vital capacity
- Inspiratory hold maneuver
- Expiratory hold maneuver
- Analyzing dynamic compliance
- Analyzing static compliance
- Finding optimal PEEP

### **Types/Modes of Ventilation (any mode of ventilation possible)**

- Choosing the correct mode of ventilation
  - e.g. Pressure control vs volume control
- Using advanced ventilation modes such as APRV, PAV, ASV, PRVC, oscillators and jet ventilation
- Non-invasive Ventilation (NIV)
  - CPAP/ BIPAP
    - Control oxygenation and ventilation with EPAP and IPAP and observe waveform changes
  - Bag-valve Mask (BVM)
    - Feel changes in compliance and resistance (including a higher expiratory resistance versus inspiratory) while bagging the patient
    - Use self-inflating and flow-inflating BVM
    - Familiarity with mask and fit
- Use of artificial airways

## **Patient Assessments**

- Chest rise
- Lung, heart and bowel sounds
- Disease diagnosis and treatment
- Hemodynamics
- Inadequate ventilation (Capnography)
- Inadequate oxygenation (SpO<sub>2</sub>, blood gases)

## **Infinite number of conditions (including but not limited to)**

- Tension pneumothorax
- ARDS
- Asthma
- COPD
- Drug overdose
- Sepsis
- Cardiac arrest
- CHF
- Pneumonia
- Post-op
- Spinal cord injury
- Traumatic brain injury
- Drug overdose
- Morbidly obese
- Infant RSV
- Infant BPD
- And many more...