

## Bio-Med Devices IC-2A Competency

- 1) What powers the vent since it does not use electricity?
  - a. It has a built-in battery.
  - b. It doesn't need anything to power it; the patient's ventilation powers it.
  - c. It is powered by a 50 PSI gas source.
  
- 2) What sequence of events should you use to place a patient in assist control ventilation, after inspiratory time, rate and tidal volume have been set?
  - a. Turn on vent, set inspiratory effort to minimum, set toggle switch to NORMAL then adjust peep level by turning PEEP/CPAP knob.
  - b. Turn on vent, set toggle switch to NORMAL, set PEEP by turning PEEP/CPAP knob, adjust sensitivity by decreasing inspiratory effort knob until the vent auto cycles, then increase the effort until it stops auto cycling.
  - c. Set inspiratory effort to the maximum setting, set toggle switch to NORMAL, turn on vent, then set PEEP by turning PEEP/CPAP knob.
  
- 3) How can I be sure that my patient is able to trigger the vent in Assist Control or SIMV mode?
  - a. The DEMAND indicator will activate each time the patient triggers a breath.
  - b. The CYCLE indicator will activate alone with each breath.
  - c. There is no way to be sure the patient is able to trigger the vent.
  
- 4) What if my desired rate is not listed on the chart?
  - a. Tough, you'll have to pick the closest rate on the chart.
  - b. You may have to choose a different inspiratory time in order to get the rate you want.
  - c. Increase or decrease the expiratory time accordingly and with the vent in NORMAL mode and count the respirations as you would a patient.
  
- 5) You have the SIMV rate set to 15 BPM, but when you set the vent up on a test lung, why does the vent only cycle at 6 BPM when you are in the SIMV mode.
  - a. If the vent does not detect a patient effort, a back-up timer will deliver one breath every 10 seconds (thus a rate of 6 since test lungs don't breathe on their own).
  - b. Something must be wrong, you must have counted wrong.
  - c. It is impossible to set the SIMV rate higher than 6 BPM.
  
- 6) Everything appears to be hooked up correctly, and you're sure you have an adequate gas source, and you have a circuit with a test lung attached. The vent is in the CYCLE mode with the power switch on, yet you don't seem to get any volume or pressure when the vent cycles...what is the most likely causing the problem?
  - a. Nothing is wrong. Everything is working normally.
  - b. The tidal volume or flow needs to be decreased.
  - c. The MAX PRESSURE knob on the back is adjusted too low.

## IC-2A Answers and Explanations

- 1) C      The vent uses a 50 PSI gas source and consumes approximately 10 LPM gas flow to power the logic circuits. If you are trying to figure out how long the vent will run on air & oxygen tanks, make sure you add 10 LPM gas consumption to the minute ventilation of the patient when doing your calculations.
- 2) B      PEEP must be set before setting the inspiratory effort. Since the inspiratory effort does not auto-compensate, any time PEEP is changed, inspiratory effort must be readjusted.
- 3) A      When the sensitivity is set appropriately, each time the patient makes an inspiratory effort, the DEMAND indicator will activate. If the patient is on ASSIST CONTROL, the CYCLE indicator will activate along with each demand effort. If the patient is in SIMV, the DEMAND indicator should activate with each patient effort. The vent will deliver the set tidal volume according to the rate set by the Insp. Time and Exp. Time knobs, and any additional breaths will open the demand valve and deliver flow at whatever flow rate is set. (Note: If the patient happens to take a spontaneous sigh breath, it's possible they could open the demand valve flow a couple times in a row to satisfy their spontaneous need.)
- 4) C      The chart on the side should be used as a guide. By adjusting the Exp. Time knob and counting the cycles of the vent when it is in the NORMAL mode you can achieve any rate between 1 1/3 to 66 BPM.
- 5) A      **VERY IMPORTANT!!!** The SIMV setting on the IC-2A is a little different than most ventilators: Your patient must truly be making a spontaneous effort and the sensitivity must be set accordingly. If the vent does not detect any spontaneous effort, a back-up breath will be delivered only once every 10 seconds at the pre-set tidal volume. If you are concerned that your patient's spontaneous effort may not be reliable and 6 BPM is not sufficient, you may want to consider using Assist Control mode.
- 6) C      When setting up for each patient, the MAX PRESSURE knob should always be set to its maximum setting initially to assure that you are delivering the full tidal volume and not pressure limiting. Once you are satisfied with the volume delivery, you can occlude the patient circuit and set the max pressure knob to a level that will provide an appropriate pressure pop off. Or, if you desire to deliver pressure limited ventilation instead of volume limited, you may set the max pressure knob to your desired pressure limit.