# SELF-ASSESSMENT RSPT 2350: MODULE K – CAPNOGRAPHY

1. What is the difference between capnography and capnometry?
    A. **CAPNOMETRY - IS THE MEASUREMENT AND <u>NUMERICAL</u> DISPLAY OF CO_2 APPEARING AT THE AIRWAY.**
    B. **CAPNOGRAPHY - IS THE MEASUREMENT AND <u>GRAPHIC</u> DISPLAY OF THE CO_2 APPEARING AT THE AIRWAY.**

2. Name the two principle ways of measuring exhaled CO_2.
    A. **MAINSTREAM SAMPLING**
    B. **SIDESTREAM SAMPLING**
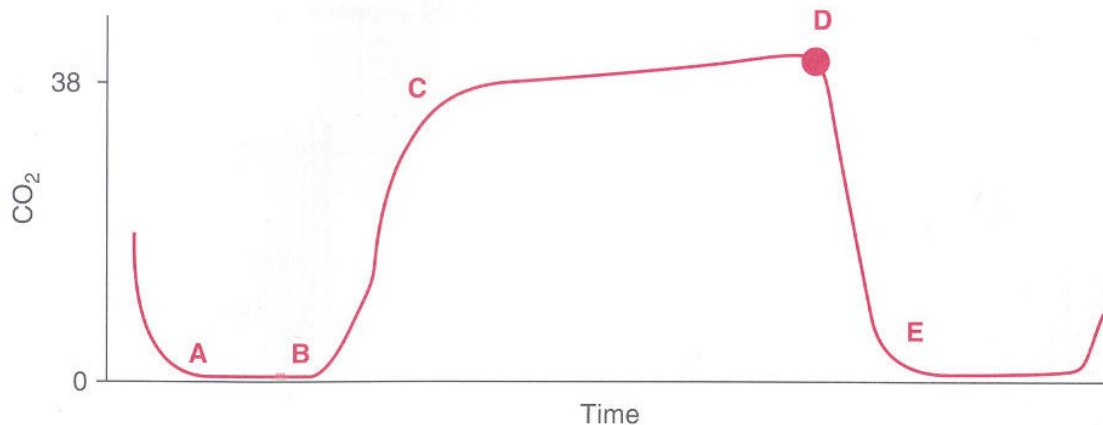
- Zero baseline (A-B)
- Rapid, sharp rise (B-C)
- Alveolar plateau (C-D)
- End-tidal value (D)
- Rapid, sharp downstroke (D-E)

3. Draw a capnogram and label the four phases. Explain the significance of each phase.

4. List the normal value for the following
    A. P_{ICO_2}: 0.3 mm Hg
    B. $PaCO_2$: 40 mm Hg
    C. F_{ICO_2}: 0.03%
    D. P_{ETCO_2}: 30-35 mm Hg
    E. P_{ACO_2}: 40 mm Hg
    F. $P\overline{E}CO_2$: 30-35 mm Hg|

5. What color will a colorimetric carbon dioxide detector (Easy Cap) turn if the endotracheal tube is in the trachea? **BIG BIRD GOOD, BARNEY BAD (YELLOW GOOD)**

6. What color will it be after 6 breaths if the tube is in the esophagus? **PURPLE**

7. What is the normal a-ADCO$_2$ gradient? **LESS THAN 5 mm Hg.**

8. Explain the effects of Deadspace on the a-ADCO$_2$ gradient. **INCREASES**

9. Explain the effects of shunting on the a-ADCO$_2$ gradient. **NO CHANGE**

10. What will happen to the CO$_2$ gradient in pure hyperventilation or pure hypoventilation?
   THERE ARE NO REAL $\dot{V}/\dot{Q}$ ABNORMALITIES IN PURE HYPER- OR HYPOVENTILATION. IF THE $P_{A}CO_2$ INCREASES, $P_{ET}CO_2$ WILL INCREASE UNLESS IT IS SO SEVERE THAT THE PATIENT IS NOT BREATHING AT ALL (RESPIRATORY ARREST) OR IS ONLY MOVING DEADSPACE GAS (INEFFECTIVE VENTILATION). IN THIS INSTANCE, THE $P_{ET}CO_2$ WILL SHARPLY DECREASE.

11. Draw a picture of the capnogram you would expect to see with COPD.
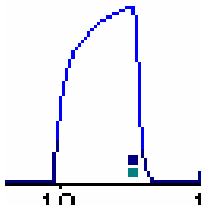
12. List 4 clinical conditions that would result in an increase in alveolar deadspace.

   A.   **COPD**
   B.   **PULMONARY HYPOPERFUSION**
   C.   **PULMONARY EMBOLISM**
   D.   **AIR EMBOLISM**
   E.   **CARDIAC ARREST**
   F.   **SHOCK (HYPOVOLEMIA OR CARDIOGENIC)**

13. List 3 clinical conditions that would result in an increase in capillary shunting.

   A.   **ATELECTASIS**
   B.   **PNEUMONIA**
   C.   **MUCUS PLUGGING**
   D.   **BRONCHIAL INTUBATION**

14. Explain how you might use the a-ADCO$_2$ gradient to track the level of optimal PEEP.

   THE $P_{ET}CO_2$ CORRELATES WITH CARDIAC OUTPUT (PULMONARY BLOOD FLOW). AS PEEP BECOMES SUB-OPTIMAL, THE GRADIENT WILL WIDEN.

15. Explain how the following conditions would effect the capnogram tracing:
  A. Hyperthermia: **INCREASE IN $P_{ET}CO_2$**
  B. Hypothermia: **SUSTAINED LOW $P_{ET}CO_2$**
  C. Decreased perfusion: **EXPONENTIAL DECREASE IN $P_{ET}CO_2$**
  D. Rebreathing of CO_2: **A RISE IN THE BASELINE**
  E. Partial airway obstruction: **SUSTAINED LOW $P_{ET}CO_2$**
  F. Hyperventilation: **SUSTAINED LOW $P_{ET}CO_2$**
  G. Hypoventilation: **INCREASE IN $P_{ET}CO_2$**

16. Explain what is meant by the curare cleft.

   A DOWNWARD SPIKE ("CURARE CLEFT") MAY BE SEEN THE PATIENT RECOVERING FROM NEUROMUSCULAR BLOCKADE.

17. Draw a picture of a slow speed capnogram.