

SAQ 3

A patient is intubated and has capnography attached.

1. What are four indications of capnography in intubated patients ?

Answer :

Verification of ET tube placement

Titration of ETCO₂ levels in patients (eg in patients with increased ICP)

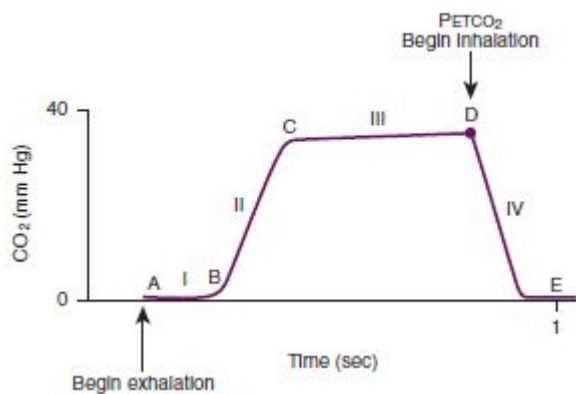
Determining adequacy of ventilation

Continuous monitoring of tube location during transport

Gauging the effectiveness of resuscitation and prognosis during cardiac arrest

2. Draw the 4 phases of the capnogram, what does each phase represent ?

Answer :



Phase I : dead space ventilation, A to B. Represents the beginning of exhalation in which dead space is cleared from the upper airway.

Phase II : (ascending phase B to C) represents the rapid rise in CO₂ concentration in the breath stream as CO₂ from the alveoli reaches the upper airway.

Phase III : (alveolar plateau, C to D) represents the CO₂ concentration reaching a uniform level in the entire breath stream, and concludes with a point of maximum CO₂ pressure (this is the number that appears on the monitor display).

Phase IV (D to E), represents the inspiratory cycle in which CO₂ concentration drops to zero as atmospheric air enters the airway.

3. What are the features of a normal capnogram ?

Answer :

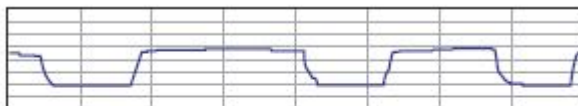
Characteristic rectangular or trapezoidal shaped capnogram and a narrow PETCO₂ – P CO₂ gradient (0-5 mm Hg), and PETCO₂ accurately reflecting PaCO₂

4. What capnogram differences do you see with a patient who has COPD ?

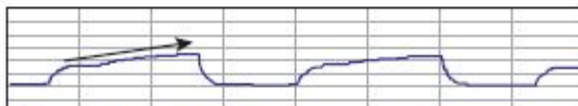
More rounded ascending phase

Upward slope in the alveolar plateau

Widened PETCO₂ – PCO₂ gradient in patients with V/Q mismatch, and PETCO₂ useful only for trending ventilatory status over time, and not as a spot check as it may not correlate with PaCO₂.



A Normal patient: Trapezoidal capnogram



B COPD patient: Rounded capnogram, upward sloping alveolar plateau (arrow)

Figure 2-13 Capnogram shape in normal subjects and patients with chronic obstructive pulmonary disease (COPD). (From Krauss B, Deykin A, Lam A, et al. Capnogram shape in obstructive lung disease. *Anesth Analg.* 2005;100:884.)