

Normal Capnogram Waveform

Indications:

- ET tube is correctly positioned
- Proper ventilation is occurring



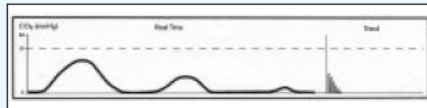
- A-B: Baseline
- B-C: Expiratory Upstroke
- C-D: Expiratory Plateau
- D: End-tidal Concentration
- D-E: Inspiration

Abnormal Capnogram Waveforms

Esophageal Intubation

Observations:

- No CO₂ sensed
- Small transient waveforms



Increasing EtCO₂ Level

Possible Causes:

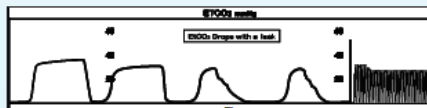
- Decrease in respiratory rate and/or tidal volume (hypoventilation)
- Increase in metabolic rate
- Rapid rise in body temperature (malignant hyperthermia)



Leak

Possible Causes:

- ET tube cuff may be deflated or ruptured
- ET tube in the vocal cords
- Mask or Bag Mask Valve leak
- Artificial airway is too small for patient



Rebreathing

Possible Causes:

- Mechanical dead space
- Mechanical ventilator failure



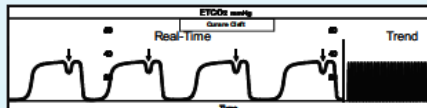
Muscle Relaxants (Curare Cleft)

Possible Causes:

- Patient is mechanically ventilated

Observations:

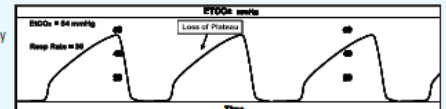
- Depth of cleft is proportional to degree of drug activity



Airway Obstruction

Possible Causes:

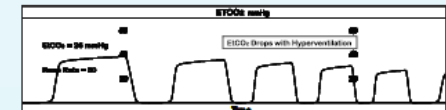
- Partially kinked or occluded artificial airway
- Presence of foreign body in the airway
- Bronchospasm
- Elevated end-tidal CO₂ valve
- Loss of alveolar plateau



Decreasing EtCO₂ Level

Possible Causes:

- Increase in respiratory rate and/or tidal volume (hyperventilation)
- Decrease in metabolic rate
- Fall in body temperature

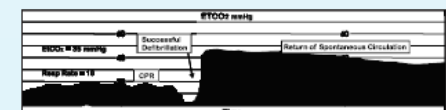
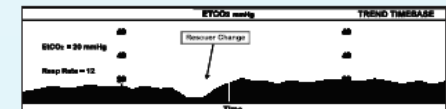


EtCO₂ During Cardiac Arrest

EtCO₂ increases significantly with the return of effective heart function.

Observations:

- EtCO₂ drops during cardiac arrest
- As rescuer tires, a decrease in EtCO₂ is observed
- Increases with effective chest compressions and heart function



On the LP-15, use the lead selector to display waveform in addition to the numeric value (print to see true scale)



Indications for ETCO₂:

- Advanced Airway Verification
- Respiratory Distress where medication is needed or considered
- Cardiac Arrest
- Sepsis
- Altered Mental Status
- Pain or Sedation Medications
- Narcan
- Any Serious Traumatic or Medical Condition



Ranges:

- Normal: 35-45mmHg (Adult & Ped)
- Cardiac Arrest: Goal >10mmHg (If <10mmHg, focus on high quality CPR)