



Waveform Capnography

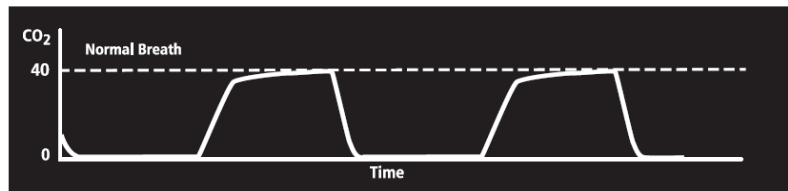
ALS PROCEDURE AP-12

<p>INDICATION</p>	<ul style="list-style-type: none">• Patient is receiving mechanical ventilation assistance (CPAP, BVM, ALS airway).• Patient is in respiratory or cardiac arrest.• Patients with head injuries.• Patients with significant respiratory distress.• Sepsis patients.
<p>PROCEDURE</p>	<p>ETCO₂ MONITORING OF VENTILATORY SUPPORT BY BVM OR ADVANCED AIRWAY:</p> <ul style="list-style-type: none">• Immediately initiate self-test, which may take up to 1 minute.• Once self-test is complete, connect the 15 mm airway adapter of the sampling sensor to the face mask, King Tube, or endotracheal tube or ETCO₂ cannula. The goal is to capture an early baseline for ETCO₂ (First breath capnography).• The CO₂ module will not recognize a breath when the ETCO₂ value < 8 mmHg. However, the waveform remains valid and can be used to determine the ETCO₂ measurement and the presence, if any, of respiration.• When CO₂ is not detected, 3 factors must be quickly evaluated for possible causes:<ul style="list-style-type: none">• Loss of airway function:<ul style="list-style-type: none">▪ Airway obstruction.▪ Apnea.• Loss of circulatory function:<ul style="list-style-type: none">▪ Massive pulmonary embolism.▪ Cardiac arrest.▪ Exsanguination.• Equipment malfunction:<ul style="list-style-type: none">▪ Improper mask seal or tube placement.• Assure the waveform is visible on the screen. The ETCO₂ monitoring area will display a reading from 0 to 100 mmHg. <p>ETCO₂ MONITORING OF NON-VENTILATORY SUPPORT PATIENTS:</p> <ul style="list-style-type: none">• The CO₂ module <u>will not</u> recognize a breath when the ETCO₂ value < 8 mmHg. However, the waveform remains valid and can be used to determine the ETCO₂ measurement and the presence, if any, of respiration.• When CO₂ is not detected, possible causes such as equipment malfunction, loss of airway function, total airway obstruction, or device malfunction may have occurred and must be quickly corrected.• Assure the waveform is visible on the screen. The ETCO₂ monitoring area will display a reading from 0 to 100 mmHg.• Oxygen can be given either by non-rebreather or a nasal cannula. Oxygen is delivered from holes proximal to the nasal/oral opening, thus O₂ will be entrained, whether the patient is a mouth breather or not.

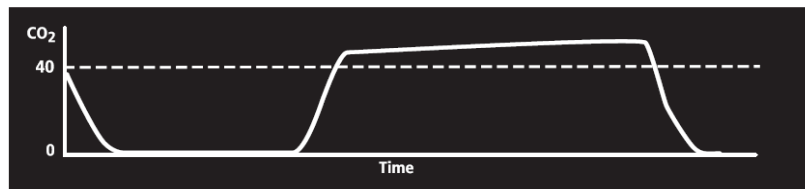
- Evaluate changes in the shape and character of the waveform as well as the ETCO₂ level.
- ETCO₂ readings may be unreliable if the patient is in shock or has poor perfusion.
- Normal ETCO₂ levels range from 32 – 36, but this may vary based on the patient's underlying respiratory and metabolic status.
- ETCO₂ levels that rise from a normal baseline to or above 40 generally indicate hypoventilation is occurring.

- The following are examples of ETCO₂ waveforms that should be used to establish a baseline and to track the patient over time. Proper interpretation of the waveform can signal the need for interventions before the classic signs and symptoms of distress are evident.

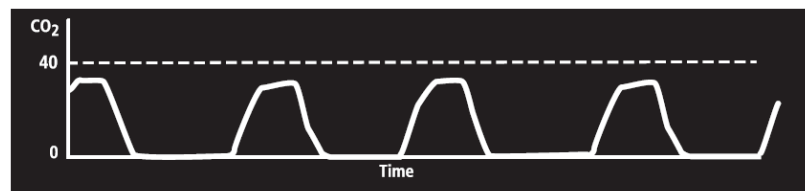
- **Normal:** Square and boxlike. Same appearance as patient's with healthy lungs.



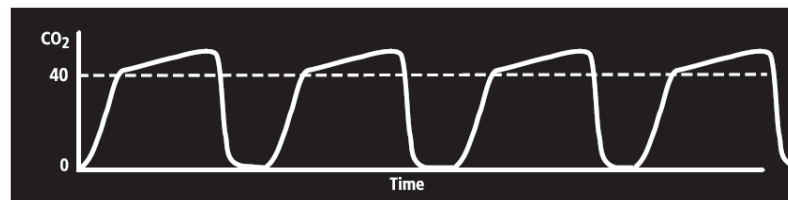
- **Hypoventilation:** Which can be due to sedation/analgesia, drug or alcohol intoxication, postictal states, head trauma, CVA, CHF, meningitis/encephalitis.



- **Hyperventilation:** Anxiety, panic attack, respiratory distress (well compensated).



- **Bronchospasm:** Diagnose the presence of bronchospasm, assess the severity of asthma and COPD and gauge the response to treatment.



- **Esophageal Intubation:** Indicates a possible esophageal intubation.

