



ETCO₂ MONITORING NON-INTUBATED PATIENTS

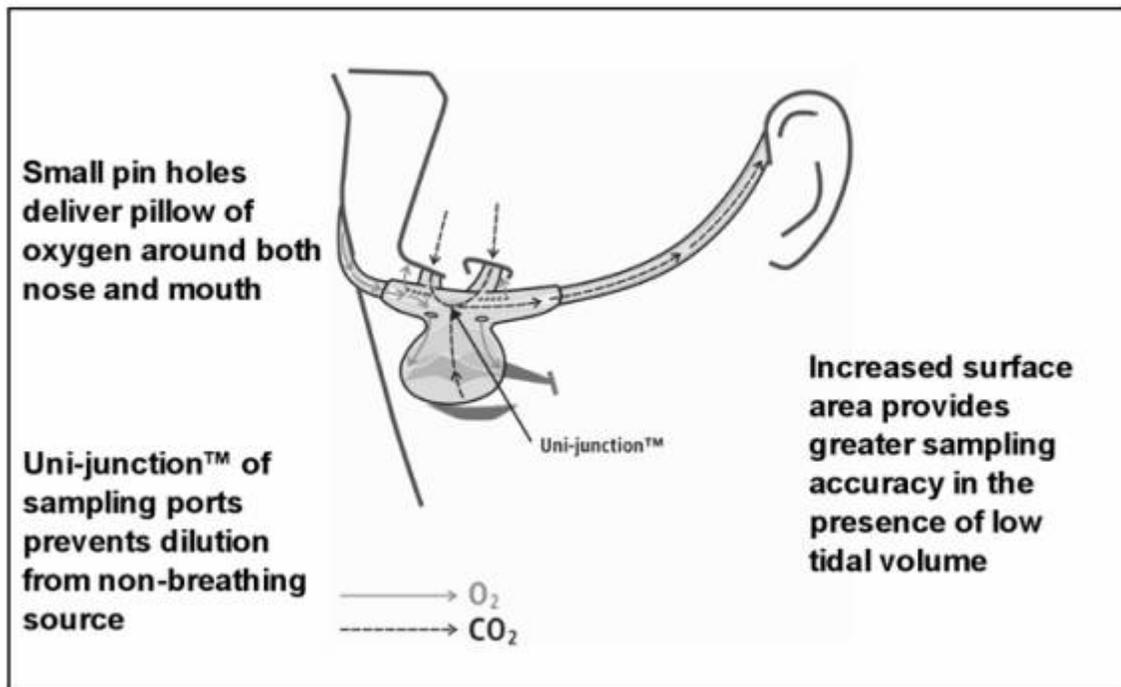


Escambia County, Florida - ALS/BLS Medical Protocol

Although the standard of care in ETCO₂ is well established for intubated patients, there has been little emphasis on the use of capnography in nonintubated patients till now.

In addition to confirming the placement of the endotracheal tube and monitoring the tube position during transport, capnography can provide qualitative and quantitative assessments of cardiac output, gauge the effectiveness of cardiopulmonary resuscitation during cardiac arrest, determine prognosis in cases of cardiopulmonary resuscitation and trauma, titrate end-tidal carbon dioxide (EtCO₂) levels in patients with suspected increases in intracranial pressure, assess response to treatment in patients in acute respiratory distress, determine the adequacy of ventilation in patients with altered mental status (including drug-induced alterations in consciousness during non-operating-room anesthesia), assess the ventilatory status of actively seizing patients, and detect metabolic acidosis in patients with diabetes and gastroenteritis.

The purpose of this protocol is to display the benefits of using capnography in nonintubated patients in emergency medicine, and to discuss recent advances in its application as a diagnostic monitoring modality.



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Charles Neal, D.O. Medical Director



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Indications:

- Rapid assessment of airway, breathing, and circulation in critically ill or injured patients.
- Assessment of ventilatory status of actively seizing patients.
- Assessment and triage of victims of chemical terrorism.



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- Assessing response to treatment for patients in acute respiratory distress.
- Determining adequacy of ventilation in patients with altered mental status.
- Assessment of patients after application of any type of restraint to prevent positional asphyxiation.

***** ANY time Physical Restraints are used (regardless of the type of restraint), the patient's status MUST be continuously monitored via Pulse Oximetry, Cardiac Monitoring, AND Nasal Capnography to avoid positional asphyxia. ***** A Lifepak monitor strip displaying ETCO2 waveform must be printed out for the record.

Procedure

1. A self test may take up to one minute to assure the display is on the screen.
2. Connect the airway adapter of the sampling sensor to the cannula and then to the LifePak12.
3. Normal exhalation moisture will not affect the sampling. However, if bronchial secretions or vomit surrounds the sampling device, erroneous readings will occur.
4. The CO2 module will not recognize a breath where the ETCO2 value is less than 8 mm Hg. However the waveform remains valid and can be used to determine the ETCO2 measurement and the presence, if any, of respiration.
5. Attach the nasal cannula ETCO2 prongs to the patient.
6. A strip should be printed out for the record.

ETCO2 normal values: 35 to 45 mm/Hg



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Special Information and Complications

When CO2 is not detected, three factors must be quickly evaluated for possible causes:

1. **Loss of ventilation**
 - Loss of Airway Function
 - Improper tube placement
 - Apnea
2. **Loss of circulatory function**
 - Massive PE
 - Cardiac Arrest
3. **Exsanguination**
4. **Equipment Malfunction**



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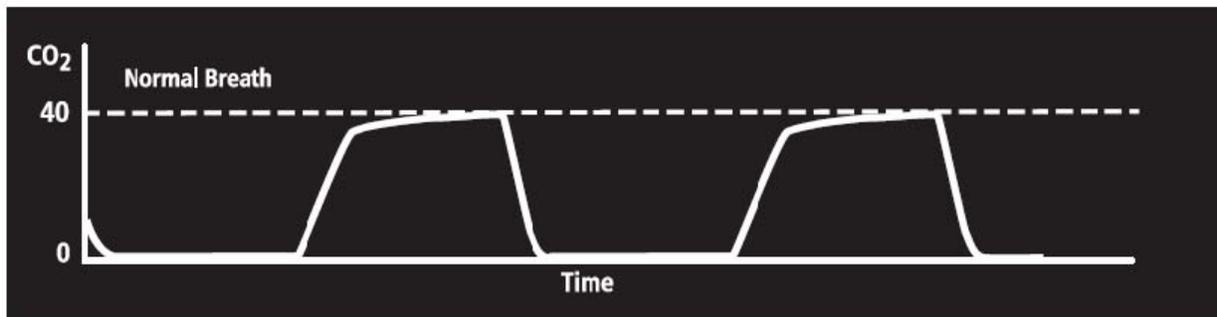


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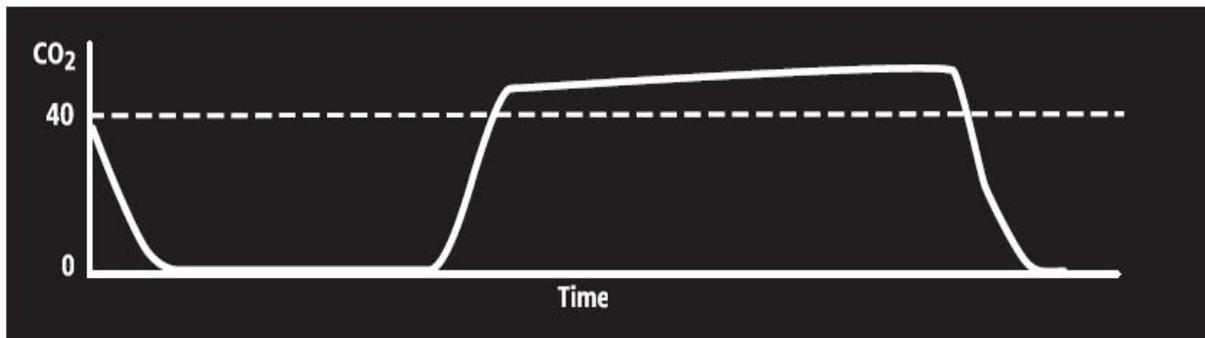
Waveform examples:

The following are examples of ETCO2 waveforms that should be used to establish a baseline and to track the patient over time.

Normal:
Square and boxlike



Hypoventilation:
Can be due to sedation/analgesia, drug or alcohol intoxication, postictal states, headtrauma, CVA, CHF



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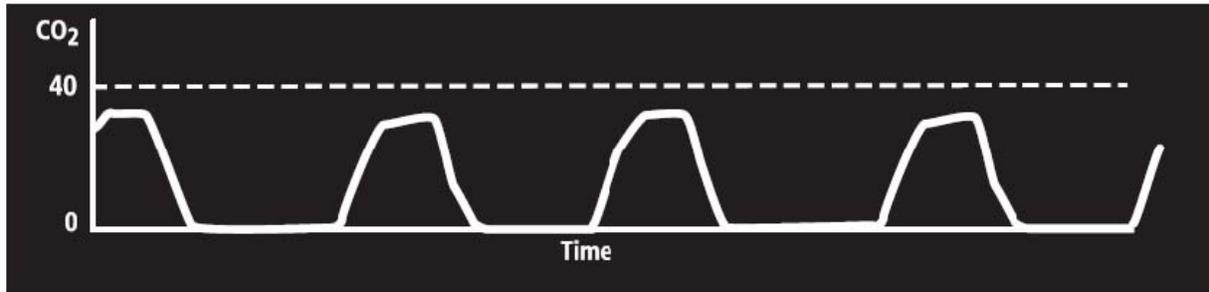


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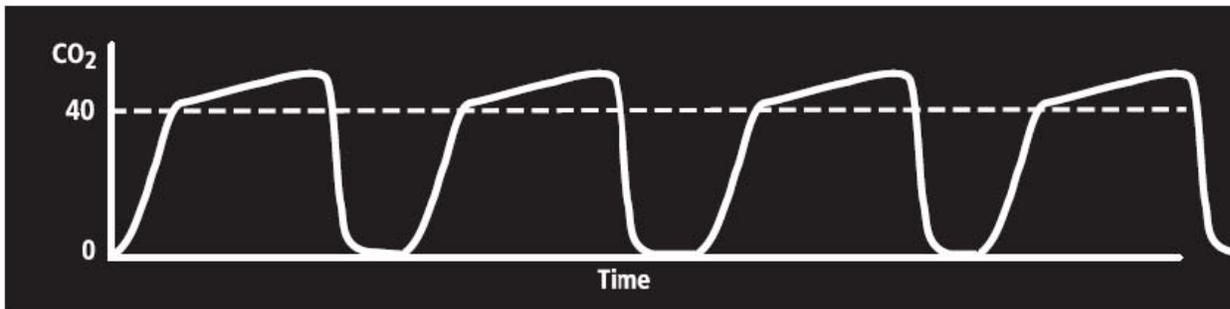


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Hyperventilation:
Anxiety, panic attack, respiratory distress (well compensated)



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



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