

## Quantitative Waveform Capnography

1. CONFIRMS ETT AND LMA LOCATION

2. MAKER OF CARDIAC OUTPUT DURING CPR 10-20

3. A JUMP IN ETCO<sub>2</sub> UP TO 35 CONFIRMS RETURN OF SPONTANEOUS CIRCULATION- IE THE HEART HAS RESTARTED

The 2010-2015 AHA Guidelines for ACLS now recommend using quantitative waveform capnography in intubated patients during CPR. Waveform capnography allows providers to monitor CPR quality, optimize chest compressions, and detect ROSC (return of spontaneous circulation) during chest compressions.

Also, according to the AHA, continuous waveform capnography along with clinical assessment is the most reliable method of confirming and monitoring correct placement of an ET tube.

### What is Waveform Capnography

Quantitative waveform capnography is the continuous, noninvasive measurement and graphical display of end-tidal carbon dioxide/ETCO<sub>2</sub> (also called PetCO<sub>2</sub>). Capnography uses a sample chamber/sensor placed for optimum evaluation of expired CO<sub>2</sub>. The inhaled and exhaled carbon dioxide is graphically displayed as a waveform on the monitor along with its corresponding numerical measurement.

As an assessment tool during CPR, capnography can help the ACLS provider determine a number of things. It is a direct measurement of ventilation in the lungs, and it also indirectly measures metabolism and circulation. For example, a decrease in perfusion (cardiac output) will lower the delivery of carbon dioxide to the lungs. This will cause a decrease in the ETCO<sub>2</sub> (end-tidal CO<sub>2</sub>), and this will be observable on the waveform as well as with the numerical measurement.

Normal ETCO<sub>2</sub> in the adult patient should be 35-45 mmHg.

Two very practical uses of waveform capnography in CPR are: 1.) evaluating the effectiveness of chest compressions; and 2.) identification of ROSC. Evaluating effectiveness of chest compressions is

accomplished in the following manner: Measurement of a low ETCO<sub>2</sub> value (< 10 mmHg) during CPR in an intubated patient would indicate that the quality of chest compressions needs improvement.

High quality chest compressions are achieved when the ETCO<sub>2</sub> value is at least 10-20 mmHg.

When ROSC occurs, there will be a significant increase in the ETCO<sub>2</sub>. (35-45 mmHg) This increase represents drastic improvement in blood flow (more CO<sub>2</sub> being dumped in the lungs by the circulation) which indicates circulation.

For the intubated patient in cardiac arrest, quantitative waveform capnography, is now considered the desired method for monitoring quality of chest compressions and determining when the patient has a ROSC.