

6.2 Quantitative Waveform Capnography

EMT/ADVANCED EMT/PARAMEDIC STANDING ORDERS

Indications:

- Confirmation of and ongoing monitoring of ETT and supraglottic airway device placement and ventilation status in both adult and pediatric patients, see [Airway Management – Adult 5.1A/Pediatric 5.1P](#), [Nasotracheal 5.5](#), [Orotracheal Intubation 5.6 Protocols](#), [Supraglottic Airways 5.8](#).
- To confirm and document ETT and supraglottic airway device placement, after every move, and at transfer of care.
- ETCO₂ should be used when respiratory distress is significant and or patient does not respond to initial beta-agonist treatment, see [Asthma, COPD, RAD 2.4A OR Asthma, Bronchiolitis, Croup 2.4P](#).
- Routine monitoring of ventilation status in patients with altered mental status or patients with a history of asthma, CHF, diabetes, circulatory shock, pulmonary embolus and or acidosis.
- Monitoring of CPR quality and for signs of return of spontaneous circulation (ROSC) in cardiac arrest patients. High quality chest compressions are achieved when the ETCO₂ is at least 10-20 mmHg. If ETCO₂ abruptly increases it is reasonable to consider that this as an indicator of ROSC.
- To assist with termination of resuscitation efforts when ETCO₂ is <20 mmHg despite adjusting the quality of chest compressions. Low CO₂ production after 20 minutes of effective CPR is a predictor of mortality. See [Resuscitation Initiation & Termination Policy 8.16](#).
- Monitoring patients following administration of narcotic pain medications or sedatives for evidence of hypoventilation and/ or apnea.
- For head injuries see, [Traumatic Brain Injury Protocol 4.7](#).

Procedure:

1. Attach the sensor to endotracheal tube, supraglottic airway, BVM or apply cannula with ETCO₂ mouth scoop or bi-cannula.
2. Observe numeric capnometry CO₂ level, (normal ETCO₂ range 35-45 mmHg) and real-time capnography waveforms.
3. Numeric capnometry as well as capnography morphology should be documented for patients undergoing airway management, cardiac arrest, altered mental status and respiratory distress.

Notes:

- High levels of CO₂ (>45 mmHg) may indicate hypoventilation/CO₂ retention, considering adjusting rate and depth of ventilation.
- Low levels of CO₂ (< 35 mmHg) may indicate hyperventilation, low perfusion, pulmonary embolus and/or sepsis, consider adjusting rate and depth of ventilation.
- Colorimetric CO₂ detectors are not an alternative to quantitative waveform capnography. ETT and supraglottic airway device placement should always be confirmed using quantitative waveform capnography.



Any abrupt loss of ETCO₂ detection or waveform may indicate a catastrophic failure of the airway, apnea, and/or cardiac arrest warranting assessment of the airway, breathing, circulation, and/ or airway device.