San Mateo County Emergency Medical Services

End Tidal CO₂ (EtCO₂) Monitoring

Clinical Indications:

Applies to:

Paramedic

End Tidal

INHALATION

Effective

EXHALATION

Field Procedure

1. Capnography shall be used when available with the use of all advanced airway procedures and as required by treatment guidelines.

Procedure:

- 1. Attach capnography sensor to the monitor first to allow for room air calibration, then attach to the advanced airway or any other oxygen delivery device, including bag-valve mask and nasal cannula.
- 2. Note that EtCO₂ level and waveform changes. Values shall be documented in the EHR.
- 3. The capnometer shall remain in place and be monitored throughout prehospital care and transport.
- 4. Any loss of EtCO₂ detection or waveform may indicate an airway problem and should be immediately addressed and thoroughly documented.
- 5. Document the procedure and results in the EHR.

Notes:

- 1. EtCO₂ readings may be unreliable if the patient is in shock or has poor perfusion.
- 2. Normal EtCO₂ levels range from 30s and 40s, but this may vary based on the patient's underlying respiratory and metabolic status.
- 3. EtCO₂ levels that rise from a normal baseline to or above 50 may indicate hypoventilation is occurring.
 Figure 1: Normal end-tidal capnography waveform
- 4. Patient stimulation, use of a BVM, or use of Naloxone may be appropriate based on the situation.

			Phase 1: Baseline	Phase 1: Baseline
Causes of Elevated EtCO ₂	Causes of Decreased EtCO ₂			i nase in suscime
METABOLISM Pain Hyperthermia Shivering	METABOLISM Hypothermia Metabolic acidosis	 Sudden loss of waveform ET tube disconnected, dislodged, kinked or obstructed Loss of circulatory function Decreasing EtCO₂ 	Bronchospasm ("Sha • Asthma • COPD Hypoventilation	ark-fin" appearance)
RESPIRATORY SYSTEM Respiratory insufficiency Respiratory depression COPD Analgesia/sedation	RESPIRATORY SYSTEM Alveolar hyperventilation Bronchospasm Mucus plugging	ET tube cuff leak ET tube in hypopharynx Partial obstruction CPR Assessment Attempt to maintain minimum	Hyperventilation	
CIRCULATORY SYSTEM Increased cardiac output MEDICATIONS Bicarb administration	CIRCULATORY SYSTEM Hypotension Sudden hypovolemia Cardiac arrest Pulmonary emboli	Attempt of maintain minimum difference of 10mmHg Sudden increase in EtCO2 Return of spontaneous circulation (ROSC)	Apnea Sedation	:mar

