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MILWAUKEE COUNTY EMS
PRACTICE GUIDELINE
END TIDAL CAPNOGRAPHY IN
NON-INTUBATED PATIENTS

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End Tidal Capnography (ETCO₂) monitoring of spontaneously breathing, non-intubated patients allows for early effective detection of hypoventilation that may result from analgesia, sedation, or medical conditions such as sedating overdoses or intoxication.

ETCO₂ may be effective in detection of metabolic acidosis causing hyperventilation in conditions such as sepsis.

This policy will focus on ETCO₂ as an adjunct for early assessment of hypoventilation; other applications of ETCO₂ for various medical conditions have been reported but are beyond the scope of this guideline.

Capnography Values

ETCO₂ 35-45 mm Hg is the normal value for capnography.

ETCO₂ Less Than 35 mmHg (HYPOcapnia ↓) suggests hyperventilation.↑

ETCO₂ Greater Than 45 mmHg (HYPERcapnia ↑) suggests hypoventilation.↓

A flat-line ETCO₂ suggests apnea.

POLICY:

- ETCO₂ will be applied on all patients who receive ketamine. Since ketamine often increases respiratory rate, the ETCO₂ value may often be less than 35 mmHg. A rare side effect of ketamine is laryngospasm. The combination of absent chest wall movement and a flat-line waveform differentiates apnea from upper airway obstruction or laryngospasm, both of which manifest chest wall movement. Response to airway alignment maneuvers (e.g., chin lift, jaw thrust) can often distinguish upper airway obstruction from laryngospasm.
- ETCO₂ will be applied on all patients below age 10 and above age 60 who receive more than 2 doses of fentanyl or midazolam. An increasing ETCO₂ trend (greater than 45 mmHg) may indicate early hypoventilation requiring stimulation, airway repositioning, reversal agent, or other airway/ventilation assistance.
- ETCO₂ will be applied on all patients whenever the clinical judgement of the EMS provider feels patient is altered as a result of a medication provided by EMS or from a medical condition being experienced by the patient. An increasing ETCO₂ trend (greater than 45 mmHg) may indicate early hypoventilation requiring stimulation, airway repositioning, reversal agent, or other airway/ventilation assistance.

ETCO₂ values should be clinically correlated.