I. PURPOSE:
The purpose of monitoring end-tidal CO$_2$ (etCO$_2$) is to provide a non-invasive measure of the patient’s ventilation, circulation and metabolism. Because it indirectly measures cardiac output it is also useful in assessing the efficiency of cardiopulmonary resuscitation.

II. POLICY:
Capnography will be performed as routine monitoring on all patients using noninvasive ventilation. Noninvasive capnography monitoring is indicated for patients that are experiencing, or at risk of developing, respiratory failure and also for patients weaning from mechanical ventilation and during cardiopulmonary resuscitation. Capnography may be initiated and monitored by a Nurse or Respiratory Therapist that has documented competency in the procedure.

III. INDICATIONS FOR THE USE OF CAPNOGRAPHY:
Airway & Emergency Management
- Detects airway obstruction, ventilation problems, endotracheal tube placement & verification.
- Provides continuous feedback on airway, breathing and ventilatory status for the non-intubated and intubated patients.

Critical Care Unit
- Detects apnea immediately, regardless of supplemental oxygen administration, and provides an earlier warning than pulse oximetry.
- Helps clinicians make decisions on weaning patients from mechanical ventilation and titrating pressure support.
- Provides a continuum of care of ventilation monitoring from intubated patients during mechanical ventilation to monitoring the weaning of the patient from the ventilator.

Medical/Surgical Units
- Monitoring patients who are receiving PCA or epidural opioid medications; detecting respiratory depression.
- Aids in decision making for clinical staff.

Procedural Sedation
- Effectively monitors the patient’s airway providing the earliest indication of airway compromise.
For the intubated patient EtCO2 can be used:
- To verify ETT placement
- To provide feedback regarding ventilations – too fast or too slow
- As an indicator for ROSC (return of spontaneous circulation)
- Rescuer fatigue during compressions
- Prediction of survivability

For the non-intubated patient EtCO2 can be used:
- Indicator of bronchospasm in patients with asthma, COPD exacerbation or anaphylaxis
- Indicate hypoventilation caused by CHF, drug intoxication, respiratory muscle fatigue or circulatory compromise.

IV. PROCEDURE:

- Wash hands and observe Standard Precautions.
- Enter room, introduce self, check patient ID using two (2) identifiers and explain procedure to patient, when appropriate.
- Gather necessary supplies:
  - Microstream Capnography Monitor (stored in Respiratory Care Department)
    - Smart Capnoline O2 Plus - used for EtCO2 sampling and oxygen administration on the non-intubated patient
    - Smart Capnoline Plus – used for EtCO2 sampling for patients on noninvasive ventilation
    - FilterLine H Set w/Airway Adaptor – used for EtCO2 sampling for patients on mechanical ventilation
- Turn monitor on and attach appropriate sampling line(s); allow monitor to complete self test.
  - For noninvasive ventilation, best results are obtained by placing Smart Capnoline Plus under full-face mask.
- Verify function through waveform and numerical read out.
- Wash hands upon completion when exiting patient room.
- Capnography values will be obtained as part of the patient-ventilator system checks for patients on noninvasive or mechanical ventilation, when applicable.
- The time and value obtained will be documented on the Ventilator Flow Sheet in the shift summary section for patients on noninvasive or mechanical ventilation; for the non-intubated patient the time and value obtained will be documented on the Patient Therapy Record in the comment section.
- Return Microstream Capnography Monitor to Respiratory Care Department.