Providence HEALTH CARE	**RESPIRATORY SERVICES**	DATE CREATED: February 2011 DATE REVIEWED/REVISED: **July 2017**
POLICY & PROCEDURE	TITLE: CRITICAL CARE – Capnography Monitoring Using N85 or Capnostream 35 Monitor (Arrest Carts) Respiratory Therapy NUMBER: B-00-12-12074	RELATED DOCUMENTS:

SITE APPLICABILITY:

ST. PAUL'S HOSPITAL
MOUNT SAINT JOSEPH HOSPITAL

POLICY STATEMENT:

Continuous capnography monitoring will be used as an aid for the confirmation of successful endotracheal intubation, as well as with cardiac arrest events to help assess the efficacy of resuscitation. Additionally, it should be used during the transport of mechanically ventilated patients and during bronchoscopy or percutaneous tracheotomy procedures.

GENERAL INFORMATION:

The N85 and Capnostream35 monitor uses non-dispersive infrared spectroscopy to continuously measure the amount of CO_2 during every breath, the amount of CO_2 present at both the end of exhalation ($EtCO_2$) and during inhalation ($FiCO_2$), and the respiratory rate. The monitors also provide pulse oximetry measurement.

INDICATIONS:

- Confirmation of endotracheal intubation
- Assessment of resuscitation (effectiveness of compressions)
- Procedural sedation (i.e. bronchoscopy, percutaneous tracheotomy)
- Transport of mechanically ventilated patients

REQUIRED SUPPLIES & EQUIPMENT:

- N85 portable capnograph/pulse oximeter or Capnostream35 portable respiratory monitor
- Microstream Filterline set airway sampling line for intubated patients (short-term)

PROCEDURE using N85 Monitor:

1. Turn on monitor using the sliding switch at the top right hand side of the unit. Allow the self-test to complete

(less than 20 seconds).

2. Ensure data has been cleared from monitor memory.

   a. **SHORT** press the → button until **CLEAR DATA** appears on the screen.
   b. *Immediately* (while **CLEAR DATA** still appears on the screen) **PRESS** and **HOLD** the **PUMP OFF/ON** button until the screen resets.

3. Attach a sampling line to the Microstream CO_2 port at the top left hand side of the monitor.

4. The sampling pump should activate automatically and perform a zero. If the pump is not active, **PRESS** and **HOLD** the **PUMP OFF/ON** button for several seconds until sampling begins.

5. Attach the sampling line airway adapter securely to the endotracheal tube.

6. Ensure monitoring is active and that a valid CO_2 measurement is obtained continuously.

N85 MONITOR OPERATION:

Data Display Screens: In measuring mode, the monitor constantly measures and displays the CO_2 waveform, $EtCO_2$ numerical value, respiratory rate, $FiCO_2$ (if enabled), SpO_2 and pulse rate values. The SpO_2 and $EtCO_2$ values are shown in the digital displays. Waveform or trends, RR, and HR values are shown in the graphic display. If a parameter is turned off, the display indicates OFF.

> **NOTE:** The $EtCO_2$ displayed on the LED numeric display represents the maximum value during the last 15 seconds (updated every 5 seconds). The $EtCO_2$ is displayed from the first breath. The $EtCO_2$ alarm is according to the waveform graphic display.

CO_2 Waveform: The CO_2 waveform screen displays real-time CO_2 waveform, pulse bar, numeric pulse, and respiration rate. The end tidal CO_2 and SpO_2 values are shown simultaneously on the digital displays.

CO_2 Time Base: The time base is the period of time captured on the display. The time base default value is 6 seconds, but changes to 3 seconds if the actual respiration rate is greater than 35 bpm. During periods of high respiration rates, the display will automatically depict the shorter time base to avoid compression of the waveform.

CO_2 Trends: The trends graph represents data of the last 30 minutes OR last 8 hours (15 second or 4 minute resolution respectively).

Pump Off Mode: This is a selectable function designed to prevent liquids from entering and saturating the filter. During Pump Off mode, pump activity is suspended to facilitate drug delivery, suctioning and equipment changes while avoiding the need to replace the consumable due to blockage. Pump Off mode can be turned on or off by pressing the Pump Off/On button for 3 seconds. The default time for Pump Off mode is 15 minutes.

N85 MONITOR SPECIAL CONSIDERATIONS:

The monitor begins measuring after recognizing one breath (after monitor power up or after exiting Standby). The monitor recognizes two breath measurement ranges:

1. **Valid Breath:** values greater than 7.5 mmHg
2. **Low Readings Breath:** values less than 7.5 mmHg

NOTE: If the first breath the monitor recognizes is a LOW readings breath, the monitor will NOT display nor emit warning signals and a **No Breath** message will **NOT** appear. If the values go above 7.5 mmHg and then fall below these ranges, the monitor will display a No Breath message and emit warning signals.

$EtCO_2$ readings between 3.0 – 7.0 mmHg appear as numerical values on the $EtCO_2$ LEDs. Readings less than 3.0 mmHg show as 0 (zero) on the display. The waveform appears on the graphic display for all $EtCO_2$ values.

The monitor enters standby after 10 minutes if no values are measured; press any button to resume operation (a brief self-test will occur).

Cleaning: Wipe all surfaces with Cavi-wipes or spray. Discard the sample line.

PROCEDURE using CAPNOSTREAM35:

1. Turn on the monitor by pressing the Power **ON/OFF** button on the front panel. The monitor will take 30-60 seconds to calibrate after it has been turned on.

2. Connect a Nellcor SpO_2 sensor to the SpO_2 cable. The cable should be attached to the SpO_2 sensor port on the monitor. Connect the SpO_2 sensor to the patient.

3. Connect the CO_2 sampling line to the CO_2 port by gently twisting the sampling line connector into the monitor port until it can no longer be turned. Attach the sampling line airway adapter securely to the endotracheal tube.

4. To toggle between the **HOME SCREEN OPTIONS**, click the **RIGHT/LEFT** button on the front panel navigational tool.

5. To adjust **ALARM LIMITS**, select **ALARM SET UP** from the **MENU** button drop down options using the **RETURN** key on the front panel of the navigational tool.

6. Individual alarms can be accessed using the **RIGHT/LEFT** and **UP/DOWN** buttons on the front panel navigational tool. Once the box containing the parameter of choice is highlighted, the parameter can be selected by pressing the **RETURN** button on the navigational tool. The parameter can then be adjusted using the **UP/DOWN** buttons. Once you have selected your value of choice, select the **RETURN** button on the navigational tool to apply the change.

7. To adjust **ALARM VOLUME** or **CO_2** and **SpO_2 SET UP** and **WAVEFORMS**, follow instructions in steps 5 and 6 above.

DOCUMENTATION, COMMUNICATION, EDUCATION:

The $ETCO_2$ value is recorded by the RN in the cardiac arrest record during an arrest. Be sure to call out $ETCO_2$ value periodically.

REFERENCES:

- N85 Operator's Manual
- Capnostream35 Operator's Manual

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