Minimally Invasive Hemodynamic Monitoring (Flo Trac, PreSep, PediSat)

I. Purpose:

1. To assess cardiac flow.
2. To provide an indication of cardiac function and volume status.
3. Contraindications:
    a. < 40 kg
    b. IABP
    c. Aortic Valvular problems (may be used depending on severity)

II. Policy:

1. RN's shall use the Flo Trac Transducer and Vigileo monitor to assess minimally invasive hemodynamics.
2. The Edward Vigileo Monitor allow for continuous cardiac output monitoring and continuous central venous oxygen saturation monitoring. Continuous cardiac output monitoring via the Edwards Vigileo Monitor using the FloTrac Sensor attached to any arterial line will allow less invasive cardiac output monitoring. Continuous central venous oxygen saturation monitoring using the PreSep/PediSat catheter will allow less invasive monitoring than mixed venous oxygen saturation.
3. RN's shall abide by the arterial line policy when using minimally invasive hemodynamics.

III. EQUIPMENT – Continuous Cardiac Output Monitoring:

Functional arterial line	IV Pole	Pressure Bag
FloTrac Sensor	Transducer Holder	
Vigileo Monitor (Edwards)	IV bag of 250cc or 500cc - 0.9% Saline	

IV. PROCEDURE – FloTrac Sensor Set up

1.	Gather equipment	
2.	Explain to patient and/or family reason for addition monitoring.	
3.	Open the FloTrac Sensor packaging. Replace all caps with non-vented caps and ensure that all connections are tight.	
4.	Remove the FloTrac Sensor from packaging and insert into a transducer holder that is secured to an IV pole.	
5.	Insert the IV bag into the pressure bag and hang on the IV pole.	Do not inflate pressure bag.
6.	Flush the FloTrac Sensor holding pressure on the IV bag and pulling the flush tab.	Clear all air and bubbles from the tubing.

7. Connect the green FloTrac connecting cable from the Vigileo Monitor to the green capped connector on the FloTrac Sensor.
8. Connect the bedside monitor's arterial pressure cable to the white cable connector on the FloTrac Sensor.
9. Connect the FloTrac tubing to the arterial line, using sterile technique.
10. Turn on the Vigileo Monitor and Set-up according to the first part of this procedure.
11. Level the FloTrac Sensor to the phlebostatic axis. Open the FloTrac Sensor to atmospheric air, rotate the knob on the monitor to **Zero** and press the knob. Select **Return** to exit screen.
12. Zero the arterial channel on the bedside monitor.
13. Close the FloTrac Sensor.
14. Inspect arterial pressure trace on bedside monitoring screen or the waveform confirmation screen on the Vigileo monitor.

KEY POINTS

IV. PROCEDURE – Vigileo Monitor Set up

1. Press the ∅ button on the front panel to turn the Vigileo monitor **ON.**

The screen will display a message indicating that a Power On Self Test **(POST)** is being performed.

2. When the **POST** is complete, enter patient information (gender, age, height, weight).

Information must be entered before continuous cardiac output monitoring can occur. Use the navigate knob to select and enter values. Press **Continue** to confirm selection and open the **Home** screen.

3. Connect the cables as outlined in the FloTrac Sensor Set up part of the procedure.
4. Rotate the navigation knob until the **CO** frame is outline in yellow and then **press** the knob to open the CO menu.
5. From the **CO Menu**, rotate the navigation knob until **Zero Arterial Pressure** is highlighted and then press the knob. The Zero Arterial Pressure screen will appear.
6. Open the FloTrac Sensor to atmospheric air, rotate the knob on the monitor to **Zero** and press the knob. Select **Return** to exit screen. Close the FloTrac Sensor.
7. Cardiac output will be displayed within 40 seconds after arterial pressure is registered by the FloTrac sensor.

III. EQUIPMENT – Central Venous Oxygenation Saturation Monitoring:

PreSep/PediSat Central Venous Catheter	IV Pole
Transducer Holder	Pressure Bag
Vigileo Monitor (Edwards)	IV bag of 250cc or 500cc - 0.9% Saline

IV. Procedure – Central Venous Oxygenation Saturation Monitoring:

1. Gather equipment
2. Explain to patient and/or family reason for addition monitoring.
3. Connect the optical module to the oximetry (red to red) connector on the back of the Vigileo monitor. Allows 20 minutes for the optical module to warm up.
4. Open the PreSep/PediSat central venous catheter lid exposing only the optics connection (or entire tray if physician is inserting at that time). Removes optics connection being careful not to contaminate tray contents. Catheter tip must remain in the sheath for in vitro calibration.
5. Connect PreSep/PediSat central venous catheter to optical module matching “TOP” on both optical module and optics connection.
6. Perform an In-Vitro calibration before inserting the catheter by:

- Rotate the navigation knob to highlight the Oximetry Frame and presses to display the Oximetry Menu.
- Rotate the knob to select “Parameter” and then

presses the knob.

- Rotate the knob and highlight the parameter to be used for oximetry (ScvO2 - when using the PreSep/PediSat central venous catheter or SvO2 – Edwards PA CCO / Oximetry catheter).
- Rotate the navigation knob to select “HGB” (hemoglobin) or “HCT” (hematocrit), then enters the lab values.

7. Select “Calibrate”. (Message seen: “In vitro calibration in progress. Ready in 20 seconds.) When the countdown reaches 0 seconds, message seen: “In vitro calibration OK. Insert catheter then select Start.”

8. Performing an “In-Vivo” calibration (May be done as an alternative to “In-Vitro” calibration. Must be done every 24 hours thereafter.)

- Rotate the navigation knob to highlight “In vivo Calibration”.
- Select “Continue” unless a “Wall Artifact or Sedge Detected or Unstable Signal” message appears. Attempts to troubleshoot per manual.
- Press the navigation knob and then:
- Draw waste sample first – slowly from the distal lumen of PreCep Catheter.
- Vigileo Monitor will remain in this mode until blood sample results are entered.
- Draw lab blood gas sample slowly (2 ml over 30 seconds). Labels sample central venous blood gas sample
- Send sample to Blood Gas Lab. Upon receipt of lab values from drawn sample, uses the navigation knob to enter the oximetry value and either HGB or HCT value.
- After values are entered, rotates navigation knob to select “Calibrate”. (At end of 25 second countdown, the Calibration Menu is removed from the screen and the Oximetry Menu is displayed.)

9. <u>Vigileo Oximetry Monitor Recall Optical Module Data</u>

- When transporting patients disconnect the optical module cable from the back of the Vigileo monitor.
- Do not disconnect the optical module from the connector or data will be lost.
- After transfer back to unit, reconnects optical module cable to the Vigileo monitor.
- If optical module is being connected to another Vigileo monitor, makes sure that previous patient data is cleared

from the monitor.

- Rotate the navigation knob to highlight the "Oximetry Frame". Presses the knob.
- Under the Oximetry Frame, selects "Recall OM Data." The calibration data in the optical module will be displayed.
- If optical module data is less than 24 hours old, confirms instructions and a Yes/No confirmation is displayed. Select "Yes" to start oximetry monitoring using the recalled calibration information OR selects "No" and performs an in vivo calibration.

~~III.~~V. DOCUMENTATION:

Cardiac output or ScvO2 will be documented on the ICU Flowsheet with each set of vital signs and with each titration of vasoactive drugs.

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