

PROTOCOL FOR: Hemodynamic Monitoring

- POLICY:
1. Hemodynamic monitoring with Swans, or arterial lines can only be performed in areas where patient is on a cardiac monitor.
 2. CVP monitoring via H₂O Manometer may be done in non-monitored areas.

DESIRED
PATIENT OUTCOME: Patient will remain free of infection secondary to insertion.

CLINICAL
ASSESSMENTS
AND CARE:

A. Insertion, Reposition, and Removal of Hemodynamic Monitoring Line:

1. HMLs can be inserted only by MD or trained designee.
2. With the exception of radial arterial lines, all other HMLs are removed only by MD or trained designee.
3. A chest X-ray is done post-insertion of a Swan-Ganz catheter or a CVP line to confirm placement and to rule out a pneumothorax. Infusion of therapeutic fluids should not be initiated until confirmation of line placement is given by the physician, unless in an emergency.

B. Invasive Monitoring:

1. All patients with invasive monitoring lines will be assessed as follows:
 - a) wave form analysis every 12 hours, unless changes are noted.
 - b) pressure readings/trends every 4 hours except PCWP and CO (every 4 hours or as ordered by MD).
 - c) dressing for intactness, dryness, drainage every 8 hours.
 - d) correlation of arterial line with B/P cuff every 12 hours and prn.
 - e) maintain pressure bag at 300mm Hg.
 - f) calibrate transducer upon initial setup, q shift and prn.
 - g) check capillary refill/perfusion distal to insertion site every 4 hours and prn.

C. IV Fluids:

1. All pressurized tubings are flushed with NS unless otherwise ordered by MD.

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2. Other IV fluids may be infused through a CVP line, and/or proximal port of a Swan.
 3. No IV fluids are to be infused via the distal port of a Swan line, due to loss of waveform if disconnected from the pressurized tubing and transducer. An MD order is needed if this port is to be used in an emergency.
 4. No IV fluids are ever infused via an arterial line unless specifically ordered by the physician (urokinase, pitressin).
- D. Blood Samples:
1. RNs may obtain blood samples from an arterial line.
 2. Mixed venous ABGs may be drawn from the distal port of a Swan.
 3. Blood samples for lab analysis may be drawn from a CVP line if no other access is available.
- E. Position/Line Care:
1. All pressure readings must be taken at the zero reference level, which is at the level of the patient's right atrium at the 4th intercostal space, anterior axillary line. The pressure transducer is positioned level at this point. All pressures are recorded using this reference point as the zero level.
 2. No air bubbles should be in the system, as this could distort your wave form, and therefore the pressure recordings. Check that all connections are secure to prevent this. See Procedures for arterial blood pressure monitoring and Swan Ganz Catheter insertion.
 3. The lock on the balloon port should always be OPEN to allow air to escape.
- F. Complications:
1. The nurse should be alert for any of the following complications which may be secondary to a hemodynamic monitoring line.
 - a) air emboli (syringe plunger doesn't "bounce" back after air injected to wedge catheter)
 - b) nonpatent line
 - c) malposition of the catheter
 - d) vessel trauma
 - e) dysrhythmias

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- f) altered skin integrity
- g) phlebitis
- h) inaccurate pressures
- i) pulmonary emboli
- j) pneumothorax
- k) coiled catheter

G. Reportable Conditions:

1. The following conditions are to be reported to the physician:
 - a. Change in wave form (or loss).
 - b. Deterioration in pressure readings indicating hemodynamic instability/compromise.
 - c. Dysrhythmias secondary to catheter placement.
 - d. Inability to aspirate blood from catheter.
 - e. IV fluid leaking from catheter.
 - f. Continuous wedge wave form even after balloon is deflated (this is considered an emergency, since permanent wedging can lead to pulmonary ischemia/infarction).
 - g. Complications secondary to monitoring.

DOCUMENTATION: 1. A strip of each wave is placed on the flowsheet every 12 hours.

APPROVAL: ICU Standards Committee
Nursing Standards Committee
Cardiac Step-Down Standards Committee

EFFECTIVE DATE: 2/88

REVISION DATES: 1/94, 11/94, 3/96, 8/97, 8/99, 11/03