Purpose

To provide guidelines for the monitoring of central venous pressure.

Policy Statement

Central venous pressure (CVP) is the pressure exerted in the cardiovascular venous system at the level of the caval-right atrium junction. The pressure measured at this site is taken to reflect the right ventricular preload or end-diastolic volume and ability of the right ventricle to pump the systemic venous return. For individuals with “normal” heart and lungs, the CVP is closely related to pulmonary wedge pressure and, therefore, to left ventricular preload.

Serial CVP measurements are more easily interpreted than isolated measurements since CVP measurement is rarely done in neonates without cardiac and/or respiratory problems. If the CVP reading is low and the cardiac output is compromised, this may indicate a state of hypovolemia. Elevated CVP readings may reflect increased PEEP, right-side myocardial dysfunction or obstructive lesions, pulmonary hypertension or left-side ventricular failure with elevated pulmonary venous pressure (congestive heart failure).

PURPOSE
• serve as a guide for fluid replacement
• monitor pressure of the central veins

Applicability
All covenant Health Neonatal Nursery staff.

Equipment
IV solution and administration set.
Pressure cable (for monitoring system)
Disposable pressure transducer

Procedure

<table>
<thead>
<tr>
<th>ACTION</th>
<th>RATIONALE</th>
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<tbody>
<tr>
<td>1. Perform hand hygiene.</td>
<td>Central line end should be at the level of the caval-right atrium junction to reflect central pressure accurately.</td>
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<td>2. Verify catheter position.</td>
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<tr>
<td>3. Insert a pressure module in an available slot to the right of the blood pressure</td>
<td>The 0-15 mmHg scale allows for appropriate visualization of the CVP</td>
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</table>
Central Venous Pressure Monitoring

module.
Change scale to 0-15 mmHg and label to CVP. Set alarm limits by the mean @ 2-12 mmHg.

4. Connect a disposable pressure transducer to the CVP monitoring line. For multi lumen catheters, CVP readings must be taken from a port with an end-hole. Zero the transducer at the level of the right atrium. The transducer line may be attached to:
   a) A separate infusion line (commonly 0.45% NaCl with 0.5 unit heparin/mL.)
   b) An infusion of fluid or medication currently infusing through the line that may be periodically interrupted to obtain CVP readings. If this option is used, a syringe of heparinized flush solution should be attached to the IV port of the transducer setup.
   c) For a non infusing line, a heparin flush solution is attached to the IV port of the transducer setup. If fluid restrictions prevent infusion, the CVP line should be flushed with 1 mL solution every 8 hours.

The transducer must be zeroed at the level of the pressure to be measured for accurate readings. Argyle catheters are all end-holes. On Arrow catheters, the end-hole is the distal port.

A CVP line that is not infused should be treated as a “heparin locked” line and be flushed every 8 hours.

5. Record CVP hourly. If there is an infusion on the CVP line (option b), turn off the infusion before evaluating the CVP.

Pump pressures interfere with accurate recording of pressure measurements especially at lower CVP levels. Ventilator pressures interfere with CVP readings but the ventilator is not disconnected routinely to obtain measurements.

6. Assess the infant’s clinical status. Changes in measurements (interpreted within the context of the clinical condition) will serve as a guide to determine whether the heart can handle its fluid load and whether hypovolemia or hypervolemia is present.

CVP measurements are interpreted by considering the infant’s clinical picture, hourly urine output, heart rate, blood pressure, cardiac output measurements and ventilator settings; a) a low CVP indicates hypovolemia, b) an elevated CVP may be from hypervolemia, PEEP settings, abdominal pressure, or poor cardiac output, or infusion pump artifact.
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Related Documents
Adapted with permission from Stollery Children’s Policy and Procedure Manual:
http://insite.albertahealthservices.ca/assets/policy/clp-capital-nicu-pp-cardiovascular-central-venous-
pressure-monitor-pro.pdf
Central Venous Pressure Monitoring – March, 2009

References
49-55

Revisions
July 2005
November 2015
Central Venous Pressure Monitoring

Signing

Original signed

GAIL CAMERON
SENIOR DIRECTOR OPERATIONS
MATERNAL, NEONATAL & CHILD HEALTH PROGRAMS
COVENANT HEALTH
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