PROGENY
VOL XXIV, NO 2 June 2008

MANAGING ACCESS IN THE NEWBORN: PART 2
UMBILICAL VENOUS CATHETERS

INDICATIONS FOR UVC PLACEMENT

- When rapid access is needed for administering emergency medications and fluids
- When caregivers are unable to establish peripheral IV access in a reasonable amount of time
- When more than one IV line is needed
- When glucose concentrations greater than D12.5 are necessary
- When IV drip medications are required
- An umbilical venous catheter may be used for blood sampling, blood product transfusion, and central venous pressure monitoring

CATHETER SIZE

- For neonates under 1.5 Kg: 3.5 French catheter
- For neonates over 1.5 Kg: 5 French catheter

INSERTION OF UVC

For resuscitations and emergency placement: Prior to insertion, flush the catheter with normal saline using a 3-way stopcock. Tie umbilical tape at the base of the cord, and tighten it slightly. Clean the base of the cord with alcohol. Cut straight through the cord with a scalpel approximately 1-2 cm above the base allowing visualization of the umbilical vein and two arteries. Tighten the umbilical tape as needed to control bleeding. Insert the catheter into the vein 2-4 cm or until there is blood return. Secure the catheter to the baby's abdomen with tape. At this location the catheter tip is below the liver and safe for administration of emergency medications. There is non-pulsatile flow here, so it is important to flush with normal saline after infusing medications. When the patient is stable enough to obtain other peripheral or central IV access, these catheters should be removed.

For non-emergent placement: The UVC should be inserted by the physician or LIP using sterile technique. Wrap the baby's legs in a diaper or blanket and secure them so that the legs and hips do not move throughout insertion. The catheter must be flushed with normal saline prior to insertion. Assist the LIP by holding the vial of normal saline to ensure aseptic technique. If possible, obtain an x-ray to confirm placement with the sterile field intact. Once the sterile field is removed, the UVC should not be advanced. However, the catheter may be pulled back to the optimal location at this point. Upon confirmation of correct placement, clean the patient's abdomen with sterile water to remove any alcohol residue. Secure the catheter to the abdomen with a transparent dressing. If possible, first apply a hydrocolloid base layer under the transparent dressing. When blood cultures are obtained from the UVC, it is important to remove the sample *before* infusing IV fluids. At UI Children's Hospital, it is recommended that all central lines have a minimum of ¼ unit/ml Heparin added to the IV fluids to prevent thrombus formation. For neonates, the total dose of Heparin should not exceed 50 units/Kg/day.

MANAGEMENT ISSUES AND PRECAUTIONS

- Documentation of insertion should include the time of insertion, catheter size, cm marking at the umbilicus, amount of blood removed for labs, IV fluids infusing, and patient tolerance of the procedure.
- Nursing assessment of the umbilical insertion site should be documented at least once every shift. The following observations should be reported to the LIP: excess bleeding; change in the depth of insertion; and, signs of infection such as redness, edema, and purulent drainage at the umbilicus.
- It is important to maintain an air-tight system. Never leave the stopcock open to room air.
- The risk for infection increases each time the UVC is accessed. Clean the stopcock with alcohol and allow it to dry before removing the syringe for blood sampling, medication administration, and tubing change.
- With the catheter tip in proper position, it is safe to infuse vasopressors through the UVC. Do not flush the catheter with normal saline or medications when vasopressors are infusing.
- For multi-lumen catheters, the open ports should be hep-locked with 0.5 ml of 10 units/ml Heparin no less than every eight hours. If the hep-locked port is accessed greater than six times per day, IV fluids should be started to keep the line open and minimize the Heparin dosage.
- At UI Children's Hospital, neonates who are medially stable and of appropriate gestational age may be held by parents with a UVC in place. This is done only at the patient's bedside and with close nursing observation.

~ Penny Smith, RNC, BSN

QUESTIONS OR COMMENTS: Contact Penny Smith, RNC or Amy Sanborn, RNC; Iowa Statewide Perinatal Care Program, Department of Pediatrics, 200 Hawkins Drive, Iowa City, Iowa 52242-1083; Phone: (319) 356-2637; Email: penny-smith@uiowa.edu. References are available upon request.