Umbilical Venous Catheter Placement - Emergency Vascular Access

Site Applicability

St. Paul's Hospital Maternity & NICU

Practice Level

Specialized:

- *Perinatal Registered Nurse (RN)*
- *NICU RNs*
- *Obstetricians*
- *Family Physicians*
- *Registered Midwives (RM)*
- *Pediatricians*

Requirements

Successful completion of Neonatal Resuscitation Provider Program (NRP) is required every 2 years.

- Physician places the umbilical venous catheter (UVC)
- RN/Physician/RM prepares and assists with placement of umbilical venous catheter and administration of medications

A minimum of 2 staff are required to administer coordinated positive pressure ventilation (PPV) and chest compressions. An additional 2 staff are required to obtain intravenous access and administer the medications.

Need to Know

The most reliable route of administration of medications during resuscitation and stabilization of the newborn is intravenously. The best venous access in the newborn is the umbilical vein.

Indications:

Intravascular medication administration required during resuscitation and stabilization

Actual or anticipated need for volume expansion

Blood sampling during resuscitation and/or stabilization

Emergency medications given during neonatal resuscitation are:

Epinephrine 1:10,000 0.1 mL/kg IV

Fluid volume 10 mL/kg IV

When there is ongoing need for the umbilical vein catheter (UVC) after resuscitation and stabilization, the catheter should be removed and a new one placed.

Equipment and Supplies

1. Umbilical vein Catherization Tray
2. Umbilical catheters 3.5 Fr and 5 Fr
3. Disposable scalpel with blade
4. Disposable antiseptic swabs
5. Umbilical tape
6. 3 way stop cock
7. 10 mL Normal Saline pre-filled syringe
8. Sterile gloves
9. Mask

All above supplies are stocked in “Grab & Go” bag.

Procedure

Setting up

1. Gather all required equipment. All necessary equipment should be in the “grab and go” bag in the Neonatal Resuscitation Cart in Maternity, Neonatal Resuscitation cart in OR Core or in Emergency Cart in NICU.
2. Perform Hand Hygiene
3. Open up sterile umbilical catheter tray using aseptic technique.
4. Open and drop the umbilical catheter, the scalpel, swabs, umbilical catheter tape, 3 way stopcock, 10 mL flush syringe onto the sterile field.
5. Put on sterile gloves.

Prepare the catheter for insertion:

1. Attach 3 way stopcock to umbilical catheter
2. Turn stopcock **OFF** to catheter.
3. Attach normal saline flush to stopcock. Purge out any air by priming with normal saline.
4. Cap 3rd port.
    a. Open stopcock to catheter and purge air out and prime with normal saline.
    b. Turn stopcock off to catheter.

Placement of umbilical venous catheter (by physician)

1. Physician puts on mask and sterile gloves
2. Cord and surrounding area are cleaned with antiseptic swabs/solution
3. Umbilical tape is placed loosely around base of cord.
    a. Either around Wharton’s Jelly or the skin margin
    b. The tie can be tightened if there is excessive bleeding after the cord is cut
4. Using the scalpel the cord is cut below the cord clamp about 1-2cm above the skin. The cut is perpendicular to the umbilical cord rather than at an angle.
    a. If you are providing chest compressions, briefly stop to create a safe environment as the scalpel enters the field to cut the cord.
5. Catheter is inserted into the vein 2-4cm until free flow of blood when the stopcock is open to the syringe and gently aspirated

   a. The umbilical vein is visible at the large thin walled vessel, usually 11 to 12 o'clock position. The 2 arteries have thicker walls and frequently are close to each other within the cord.
   b. For emergency use, the catheter top should only be located a short distance into the vein. If the catheter is inserted further in, there is a risk of infusing medications directly into the liver which may cause hepatic injury.
6. One person holds the catheter in place while another administers the medication.
   a. After administration of the medication either remove the catheter or secure it to the abdomen with a small piece of tape to prevent accidental removal. Do not advance the catheter once the sterile field has been contaminated.

Medication Administration

1. **All medications must be checked by 2 providers (RNs, RMs, or Physicians)**
2. Attach the syringe containing either epinephrine or volume expander to the available stopcock port
3. Turn the stopcock so that it is open between the syringe and catheter
   a. Ensure there are no air bubbles in the syringe or catheter.
4. Administer the appropriate dose and flush the catheter.

Removal of the Umbilical Venous Catheter (by physician)

1. Slowly remove the catheter and be prepared to control bleeding by tightening the cord tape.
   a. Because the umbilical vein runs just below the skin, umbilical venous bleeding usually can be stopped by applying pressure above the umbilicus.
2. If the catheter is left in place during continued stabilization or transport, it should be secured to the abdomen with a small piece of tape.
3. If the UVC is required for longer therapy, emergency placed UVC must be removed and a new catheter placed under strict aseptic conditions.
   a. Due to the emergency conditions the UVC was placed under, there is a higher risk of contamination. To reduce the risk of infection, the UVC needs to be replaced using standard UVC procedure.

Documentation

Document Emergency Vascular Access on the Neonatal Resuscitation Record.

Patient and Family Education

Provide patient and family with information and indication for emergency vascular access using language they can understand. Use interpreter if needed (virtual/ or in person).

Related Documents

Guidelines/Procedures/Forms

1. B-00-12-10046 – NICU: Umbilical Venous/Arterial Catheter Insertion
2. Neonatal Resuscitation Textbook, 7th edition (2016)

References

American Academy of Pediatrics. (2016). Neonatal Resuscitation 7th edition.

ACORN. (2012). Acute Care of at Risk Newborns Textbook.

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