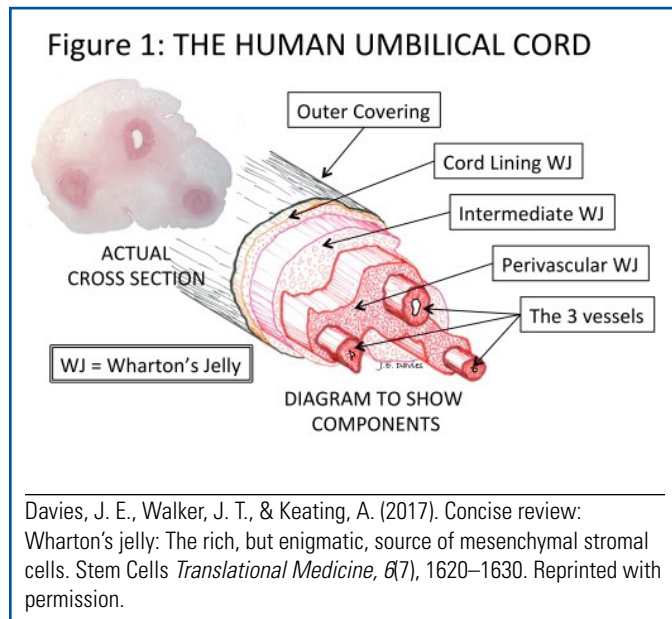




Umbilical Venous Catheter/Umbilical Artery Catheter

The umbilical cord is clamped just prior to separating an infant from his or her mother. This cord usually has three vessels consisting of two arteries and one vein. Because these vessels are easily accessible, if an infant is sick or premature and needs intravenous or arterial access, these vessels may be used first for quick access.

The umbilical venous catheter (UVC) is placed in the vein of the cord. This line is used to administer total parenteral nutrition, emergency or vasoactive medications (epinephrine, dopamine, etc.), and other fluids to infants who are sick and will need to receive nothing by mouth for some time. The line also may be used to administer blood products if needed. UVCs decrease the need for intravenous (IV) lines in the hands, arms, or feet and thereby decreases the number of times an infant is stuck to maintain a peripheral IV. The line is placed by a neonatal provider (medical doctor, neonatal nurse practitioner) or specially trained registered nurses. Line placement should be a sterile procedure with full barrier protection. The procedure usually takes place at the infant's bedside, and requires an X ray to validate line placement. Placement should be verified before any fluids are infused through the UVC. The UVC tip should be above the diaphragm but below the junction of the inferior vena cava and the superior vena cava on chest X ray. The only exception to this rule is when the UVC is placed in the delivery room during resuscitation. When the catheter tip is in a good position, a UVC can be left in place for several days but should be removed as soon as possible.



Umbilical Catheters

1. Remove and do not replace umbilical artery catheters if any signs of CRBSI, vascular insufficiency in the lower extremities, or thrombosis are present [145]. **Category II**
2. Remove and do not replace umbilical venous catheters if any signs of CRBSI or thrombosis are present [145]. **Category II**
3. No recommendation can be made regarding attempts to salvage an umbilical catheter by administering antibiotic treatment through the catheter.
Unresolved issue
4. Cleanse the umbilical insertion site with an antiseptic before catheter insertion. Avoid tincture of iodine because of the potential effect on the neonatal thyroid. Other iodine-containing products (e.g., povidone iodine) can be used [146–150]. **Category IB**
5. Do not use topical antibiotic ointment or creams on umbilical catheter insertion sites because of the potential to promote fungal infections and antimicrobial resistance [88, 89]. **Category IA**
6. Add low-doses of heparin (0.25–1.0 U/ml) to the fluid infused through umbilical arterial catheters [151–153]. **Category IB**
7. Remove umbilical catheters as soon as possible when no longer needed or when any sign of vascular insufficiency to the lower extremities is observed. Optimally, umbilical artery catheters should not be left in place >5 days [145, 154]. **Category II**
8. Umbilical venous catheters should be removed as soon as possible when no longer needed, but can be used up to 14 days if managed aseptically [155, 156]. **Category II**
9. An umbilical catheter may be replaced if it is malfunctioning, and there is no other indication for catheter removal, and the total duration of catheterization has not exceeded 5 days for an umbilical artery catheter or 14 days for an umbilical vein catheter. **Category II**

From the Centers for Disease Control and Prevention



CDC Guidelines for Umbilical Catheters

The umbilical artery catheter (UAC) is placed in one of the arteries in the cord. This line is used to continuously monitor an infant's blood pressure and also to collect frequent blood samples without sticking the infant. A UAC is usually placed at the same time a UVC is inserted. X-ray confirmation reveals the position of the UAC, and assuming the infant's abdomen is included in the film, the tip of the UAC should be between the sixth and eighth ribs. Some units still place the tip at the third to fourth lumbar intervertebral space, but a Cochrane systematic review (Barrington, 1999) found that high lines (T6-T8 tip position) had fewer complications than those placed low (L3-L4).

Lines should be secured according to the unit's policy. Securement is important as it reduces "play" in the lines and may reduce migration of the catheters to unsafe areas. The UAC will then require a pressure transducer to be connected to the line for pressure monitoring. It also is important to remember that all umbilical lines should always have luer connections and stopcocks, to decrease the risk of blood loss due to loose connections.

With both or either umbilical lines, care should be used when handling the infant to prevent dislodgement

of the line or stopcock (which can lead to bleeding). Dislodgment will require line replacement, repositioning, or removal. Meticulous care will help prevent inadvertent turning of the stopcock, which can lead to blood loss. When an infant is being held and wrapped in blankets, special attention should be paid to the integrity of the catheter and connections.

Reference

Barrington, K. J. (1999). Umbilical artery catheters in the newborn: effects of position of the catheter tip. Cochrane Collaborative, Neonatal Group. Retrieved from www.cochrane.org/CD000505/NEONATAL_umbilical-artery-catheters-in-the-newborn-effects-of-position-of-the-catheter-tip

Bibliography

- Gardner, SL, Carter, BS, Hines, ME & Hernandez, JA. Merenstein and Gardner's Handbook of Neonatal Intensive Care. 8th Ed. 2016. Elsevier.
- Centers for Disease Control and Prevention. (2017). Guidelines for the prevention of intravascular catheter-related infections. Retrieved from www.cdc.gov/infectioncontrol/guidelines/bsi/recommendations.html
- O'Grady, N. P., Alexander, M., Burns, L. A., Dellinger, E. P., Garland, J., Heard, S. O. ... Saint, S.; Healthcare Infection Control Practices Advisory Committee (HICPAC). Guidelines for the prevention of intravascular catheter-related infections. *American Journal of Infection Control*, 39(4 Suppl 1), S1–S34.



Umbilical Vein Catheter and Umbilical Artery Catheter: Information for Parents

After delivery, a baby is separated from his or her mom by clamping, then cutting, the umbilical (navel) cord. The cord typically has two arteries and one vein that are easily accessible, providing quick access to the central circulation and are used frequently when infants are born early or sick. These lines will keep your baby from needing a regular intravenous (IV) line for several days and decrease the number of times they have their skin poked. Umbilical lines are inserted by a physician or neonatal nurse practitioner (NNP). The physician or NNP will explain the risks and benefits of the procedure.

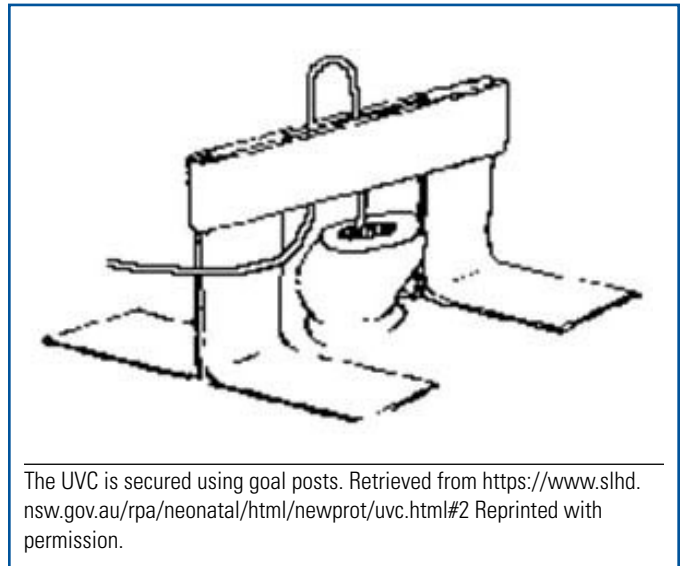
Umbilical Artery Catheter

An umbilical artery catheter (UAC) is placed in the artery of your baby's umbilical or navel cord. This catheter is used to obtain frequent blood samples and monitoring of your baby's blood pressure. Blood samples are necessary to help the medical team determine how well your baby's lungs and other body organs are functioning. Blood is drawn directly from this line, alleviating the need to do heel sticks on your baby. The UAC typically is in place for 7–10 days. If your baby still needs blood pressure monitoring or blood samples, an arterial line may be inserted in his or her ankle or wrist.

A UAC line usually is placed right after delivery or right after transport and admission to the referring hospital, and typically at the same time as an umbilical venous catheter (UVC) is placed. Once the lines are in place, an X ray is done to make sure the lines are in the correct position before they are used. The lines are then held in place with suture (like string) and secured to the infant's abdomen (see picture).

Umbilical Venous Catheters

An umbilical venous catheter (UVC) is placed in the vein of your baby's umbilical or navel cord. This catheter is used to give your baby IV nutrition (nutrition given in the vein) or medications. The line typically remains in place for 7–10 days. If your baby still needs IV nutrition, either a peripherally inserted central catheter (PICC) or regular IV



will be inserted. The UVC usually is inserted with a UAC right after delivery or transport. There are times when a UVC will be placed after the baby is a few days old when access to a big vein is needed. In this case, the provider caring for your baby will explain the reason for the line and get your approval.

When the proper position of both catheters is confirmed by the X ray, the lines will be sutured in place or secured to the infant's abdomen.

Possible Complications

Complications may include infection, formation of blood clot (thromboembolism) on the tip of the line, or the line moving in or out of position. Because of these possible complications, the nurse will watch your baby closely. The lines are placed with a sterile (without germs) technique to decrease the risk of infection. Fluids going in both UVC and UAC lines will contain a medicine called heparin, which prevents the formation of blood clots. Finally, the nursing staff will closely monitor the catheters for any potential issues. All umbilical lines will be discontinued as soon as they are no longer needed.