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Venous Access/Central Venous Catheters (Broviac, Hickman, Portacath, PICC line, Mediport)

Patient and family information, brought to you by the Education Committee of APSA

Overview - “What is it?”

Venous catheters (“central lines”) are special thin plastic or silicone tubes placed into a large vessel with the tip of the catheter positioned near the heart. Central lines are often used instead of peripheral IVs (a short catheter in the arm or leg) when long term treatment (weeks or months) will be needed. In addition, central lines may be used when a child has very small veins or there is difficulty in obtaining an IV. Typically, these catheters are used for chemotherapy, intravenous nutrition, intravenous fluids, intravenous antibiotics, and blood draws.

There are many types of central venous access devices:

- PICC lines (**P**eripherally **I**nserted **C**entral venous **C**atheters) (Figure 1)
- Non-Tunneled Catheters (“Cook”® catheters)
- Broviac®/Hickman® tunneled catheters (Figure 2)
- Portacath/Mediport/Infusaport (Figure 3)
- Umbilical catheters in newborns

Figure 1: PICC Line
Photo courtesy of lymelens.com

Figure 2: Broviac or Hickman catheter: The entry to the catheter is exposed on the skin.

Figure 3 (left): Mediport/ Infusaport/Portacath ***Figure 3 (right):*** Smiths-medical.com
When not in use, the chamber is completely underneath the skin. When infusion or blood draw is needed, a special needle is used to go through the skin and access the port.

Signs and Symptoms - "What symptoms will my child have?"

Children may need central venous access for many different reasons and your doctor may recommend one type of device over another because of the type of treatment needed. Excellent vascular access is a necessity in the treatment of many cancers. A central line may be necessary for some types of cancer, while a portacath may be needed for others. Chemotherapy and blood product administration and frequent blood draws are made possible with these important devices.

Another use for central lines includes short term IV nutrition in those patients who cannot eat for a period of time, or long-term IV nutrition in patients who may not have enough intestine to support growth. Other patients may need central IV access for long-term IV antibiotics for certain infections.

Diagnosis - “What tests are done to find out what my child has?”

Blood tests may be obtained to make sure blood is able to clot appropriately
An **ultrasound or Duplex study** of the blood vessels may be needed to see which vessels may be suitable for placement of the catheter, especially if your child has had previous central venous catheters.

Treatment - “What will be done to make my child better?”

Surgery: Your doctor will first decide what type of catheter is needed based on length of treatment and the indication for the central catheter. PICC lines can often be inserted at the bedside with just a small amount of pain medication injected at the site of insertion. Most other central catheters will be placed in the operating room or radiology department with sedation or anesthesia. The blood vessels used for placement may be located either by percutaneous (needle directed through the skin into the vein) or cutdown (incision directly over the vein) techniques.

Informed consent: A consent form is a legal document that states the tests, treatments or procedures that your child may need and the doctor or practitioner that will perform them. Before surgery, your doctor should tell you what the operation is, the goal of the surgery and other possible treatment options that are available. Your doctor should explain the risks and benefits of the surgery. You give your permission when you sign the consent form. You can have someone sign this form for you if you are not able to sign it. You have the right to understand your child’s medical care in words you know. Before you sign the consent form, make sure all of your questions are answered. It is important to know that during surgery, there are things that can happen that your doctor may have not predicted before going in. He or she will explain these to you after the surgery.

Preoperative care: Your child will have to have an empty stomach for several hours before the sedation/anesthesia.

Postoperative care: Most children do not experience much pain after the procedure, but pain medications may be ordered as needed. The catheters can usually be used immediately after they are placed.

A chest X-ray may be obtained after the procedure to confirm correct positioning of the catheter.

You will be taught how to care for the incision and the catheter before you leave the hospital.

Risks/Benefits: The main risks of central venous catheter insertions are bleeding and infection but in an experienced surgeon's hands, these risks are very low. Depending on how and where the catheter is placed, other risks include pneumothorax (air in the chest outside of the lung), injury to surrounding arteries and nerves and clotting of the blood vessels near and around the catheter.

The primary benefits of the catheter are ease of administering fluids and medicines, ease of obtaining blood draws and avoids the need for frequent needle sticks to find a vein for a peripheral IV.

Home Care - "What do I need to do once my child goes home?"

Diet: There should be no restrictions on the diet after this procedure.

Activity: Your child should avoid any direct contact or trauma to the site of the catheter. Once the wounds are healed, your child should be able to bathe normally although with exposed catheters (PICC lines and Broviacs) the skin exit site of the catheter will need to be covered with a waterproof dressing.

Wound care: A dry, sterile dressing will need to be placed over exposed catheters, and you should be instructed in dressing care before leaving the hospital. In some instances, the parent will be taught care. In other instances, the dressing will only be changed at certain times in clinic by a health care professional.

Medicines: Your child should not need any additional medicines from catheter placement, but he/she may be started on new medicines that were the indication for the catheter.

What to call the doctor for: Call your doctor or go to the emergency room for any redness, drainage, fluid leakage or increased tenderness around the catheter. You should also notify your doctor immediately for any fever or pain when the catheter is flushed or used.

Follow-up care: Your child will need to follow up with their regular physician who requested the central line placement. You will need to see the surgeon again when it's time for removal of the catheter. This can sometimes be done in the office for PICC lines and some Broviac/Hickman catheters. For catheters that have been in for several months and for portacaths, your child will need to go to the operating room for removal.

Long Term Outcomes - "Are there future conditions to worry about?"

Long-term complications of central venous catheters include infection and clotting of the catheter. These problems can sometimes be treated with administration of medication through the catheter but occasionally the catheter will have to be removed and replaced with a new one.

The more catheters your child has (especially if placed in the same blood vessel), the greater the risk of chronic scarring and possible clotting of the blood vessels, which may make it more difficult to place additional catheters in the future.

Updated 10/2021
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