



# Vascular Access Procedure

*Midline catheter, peripherally inserted central catheter (PICC) – Hickman, Broviac, or Groshong Catheter*

**A vascular access procedure is done if you need intravenous (IV) access for longer than 7 to 10 days. This handout explains the different types of catheters, how to prepare for the procedure, what to expect during the procedure, and when to call your doctor or nurse.**

A vascular access procedure is for patients who need intravenous (IV) access for longer than 7 to 10 days. A simple IV set-up works in the short-term, but is far from ideal when a patient needs chemotherapy, several weeks of IV antibiotic treatment, or long-term IV feeding.

A vascular access catheter is a long, thin tube that is placed in a branch vein in the arm, neck, or just beneath the collarbone. The tube then is threaded into a major vein in the chest. In many conditions, having this type of tube inserted provides a simple and painless means of drawing blood or giving drugs, nutrients, or both. In this way, the patient is spared the pain and stress of repeated needle sticks. These *central catheters* can stay in place for several weeks or even months.

## What are some common uses of vascular access?

- A central catheter permits solutions containing medication or nutritional substances to be given with little risk of causing the problems that may occur with an IV, such as blood clots or local tissue damage. A central venous catheter that is a **subcutaneous** (beneath the skin) **implantable port** is ideal for cancer patients who need chemotherapy once every 2 to 4 weeks. The device does not get in the way of daily activities and needs no special maintenance.
- A **central venous access catheter** is used for a variety of medications, notably antibiotics.
- A **central line** offers a temporary, but long-term, answer to malnutrition by providing nutritional support and supplements. Patients who are expected to require IV nutrition or frequent blood draws for a prolonged time can benefit from having a **tunneled catheter**, a more permanent type of device that causes scar tissue to form, anchoring the catheter to patient tissues.

- A **vascular access catheter** may be used for a short time for hemodialysis (filtering the blood) if the usual link between an artery and vein is blocked by clotted blood. In this case, the catheter contains 2 separate routes (lumens): one that takes venous blood from the body to be cleansed in the dialysis machine, the other that returns blood to the body once the blood is cleansed. A catheter is also useful if kidney disease gets worse rapidly and there is no time to install permanent vascular access before starting hemodialysis.
- A **venous access catheter** may serve to deliver blood transfusions.

### How should I prepare for the procedure?

You will receive instructions from your doctor who has ordered placement of an access device. You will have blood drawn for pre-procedure testing at either the hospital or your doctor's office. Staff will tell you if changes in your regular medication routine are needed. You may need to avoid eating or drinking anything for several hours before the procedure. You may receive sedatives during the procedure. Make sure that someone can drive you home.

### How does the procedure work?

Several types of vascular access devices are available. They differ in the conditions for which they are used, how long they last, ease of use and many other factors. The major types are:

- The **midline catheter** is a type of IV line that is somewhat like a routine IV and a central catheter. It is placed through a vein near the elbow and threaded through a large vein in the upper arm. Though durable, at 4 to 6 inches, the midline catheter is not long enough to give some highly irritating medications. A nurse can insert a midline catheter at the patient's bedside; no imaging help is needed.
- The **peripherally inserted central catheter (PICC)** is also introduced through an arm vein but its tip lies in a large central vein. It typically provides central IV access for up to 4 to 8 weeks. A PICC may remain in place for 3 to 5 months in special cases, as long as it continues to work well and is not infected, but it still is considered to be a temporary catheter. A trained nurse or physician's assistant can place a PICC at the bedside as long as the veins close to the surface of the skin are in good shape. Imaging guidance – by *fluoroscopy* or *ultrasound* (two forms of X-rays) – is sometimes necessary, in which case the PICC will be placed by a specially trained doctor or physician's assistant in the Imaging Services department. Because a PICC can be cared for at home, patients can often go home from the hospital earlier than with other catheter placements. Any trained health care worker can easily pull the PICC line out when it is no longer needed.

- The **tunneled catheter**, also known as a **Hickman, Broviac, or Groshong catheter**, is a permanent catheter that is fixed in place when scar tissue forms. It is typically inserted into the *subclavian vein* (a large vein just below the collarbone) or into the external jugular vein (a large vein in the neck). It is then tunneled from the puncture site down onto the chest wall, emerging from the skin about 6 inches from where it entered the vein. The tip of the catheter lies in the large vein that returns blood to the heart. This type of catheter is the best choice when a patient is likely to need access for longer than 3 months and when the line will be used many times each day. It is secure and easy to use. A drawback of these catheters is that a small percentage of tunneled catheters must be removed prematurely due to infection.
- The **subcutaneous port** is a permanent device made up of a catheter attached to a small basin implanted beneath the skin. The entire device is inside – nothing can be seen on the outside of the skin except for a small bulge. The catheter, which passes from an access site in a vein of the arm, shoulder, or neck, ends in a large central vein in the chest. The basin has a silicone covering that can be punctured with a special needle. The port is used mainly when IV access is needed every so often over a long period, as in chemotherapy. Its only drawback is the need for a needle stick whenever treatment is given, but discomfort usually is not marked and tends to decrease over time.

### What will I feel during the procedure?

You will lie on your back during the procedure. The local anesthetic may burn for a short time before it takes effect. You may feel some pressure or brief discomfort when the needle is placed into your vein, and also when a tunnel is created. You will have to lie flat and hold still for about 30 to 45 minutes during catheter placement.

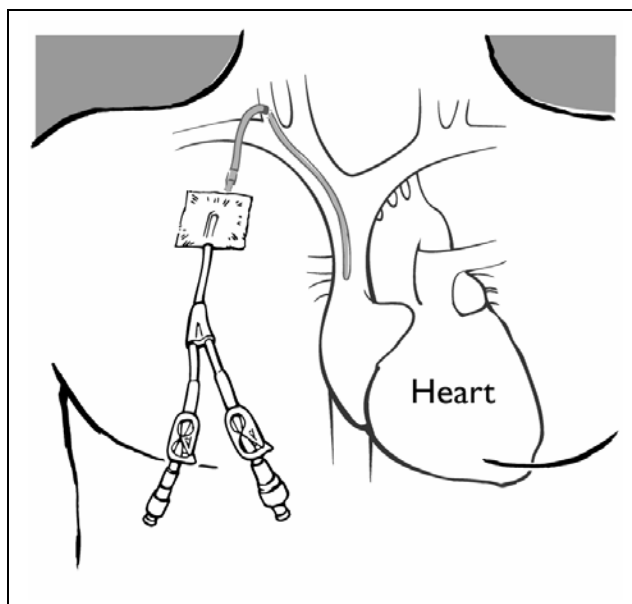


Figure 1: Hickman catheter.

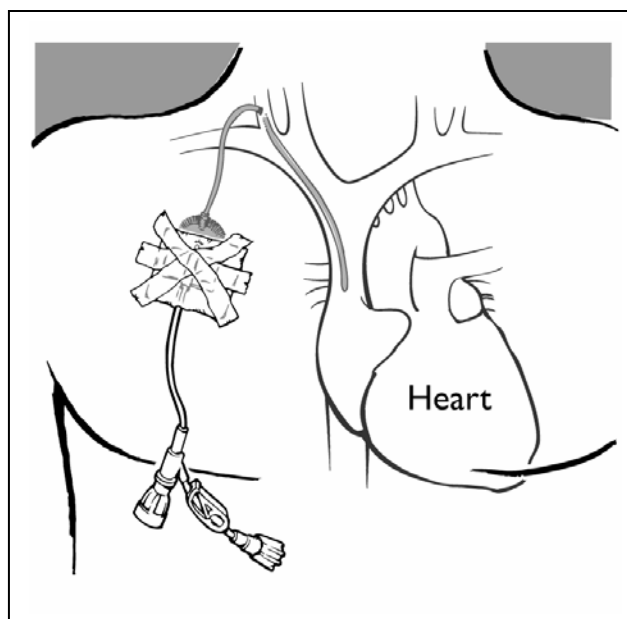
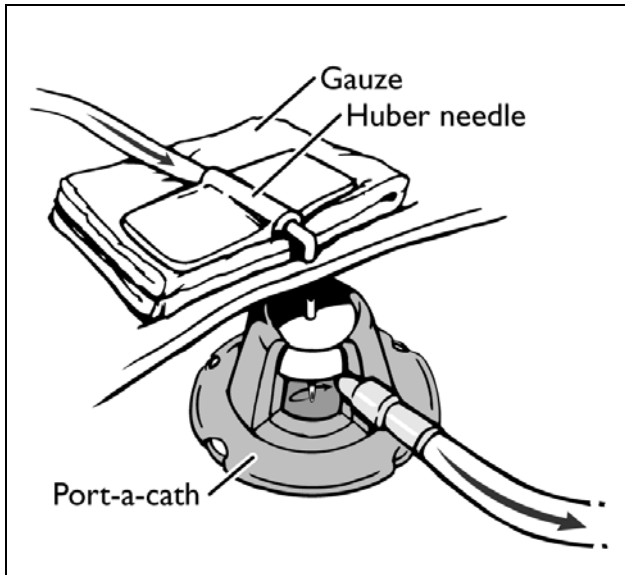


Figure 2: Port-a-cath.



**Figure 3:** Port-a-Cath accessed with a huber needle.

### What should I do after the procedure?

When discharged, you should rest at home for the rest of the day. You may resume your usual activities the next day, but avoid lifting heavy objects. After having a tunneled catheter or subcutaneous port placed, you should expect some bruising, swelling, and tenderness in the chest, neck, or shoulder, but these symptoms resolve over about 5 days. Pain medicine may help during this time. The cuts will heal in 7 to 10 days, and the stitches may be removed after that time, according to your doctor's instructions.

For the first week, it is especially important to keep the catheter site clean and dry. Some doctors will recommend sponge bathing around the catheter site, then cleaning the area with peroxide, applying an anesthetic ointment that contains an antibiotic, and bandaging the area. It is important to closely follow the instructions given to you about how to care for the cut and the device. You may be told that it is all right to shower after a week, using a piece of plastic wrap over the catheter insertion site, but not to swim.

Flushing the catheter at a stated interval with a *heparin* solution may help keep blood clots from forming and blocking the catheter.

Instructions will vary according to the type of device used. Your health care team will make sure that you know what to do.

Call your doctor or nurse if you have any questions about your vascular access device. You *must* notify them if problems develop with your catheter. Problems needing medical attention include:

- Malfunction of the device.
- Bleeding at the insertion site.
- Signs of infection such as:
  - Fever.
  - Redness, warmth, or increased swelling or tenderness at the catheter insertion site.
  - Fluid drainage from the site.

