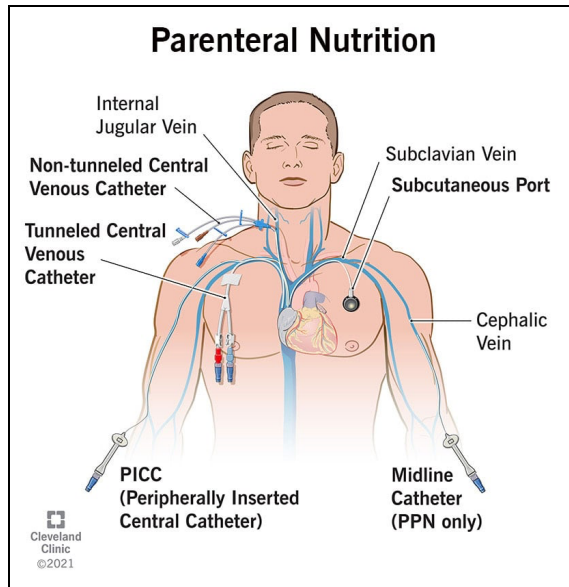


What is Parenteral Nutrition and What is Intravenous (IV) Therapy?



Whereas enteral nutrition involves the delivery of food, water, and medications to your digestive system through a feeding tube, parenteral nutrition is completely different. *Parenteral nutrition* also delivers food, water, and medications, but it does so intravenously (through a vein). This means that the digestive system is essentially bypassed, and is uninvolved in the uptake of nutrients (Cleveland Clinic).



A popular means of parenteral nutrition is intravenous (IV) therapy, in which nutrition, fluids, medicines, and blood products are received by the bloodstream. This way, the gastrointestinal tract is completely avoided.

In simplest terms, IV therapy involves the insertion of a flexible plastic tube through the skin into a vein. It can be used to deliver important treatments and medications, such as chemotherapy, immunotherapy, anti-nausea medications, electrolytes, antibiotics, and so much more. Moreover, IV therapy can be delivered in hospitals, clinics, doctor's offices, or at home.

Depending on the needs of the patient and the doctor's recommendations, different types of IV catheters may be used. Catheters differ based on two main factors: (1) where they are inserted and (2) what specific job they perform for the body. The three most widely used types of IV catheters are peripheral IVs, central venous catheters, and midline catheters.

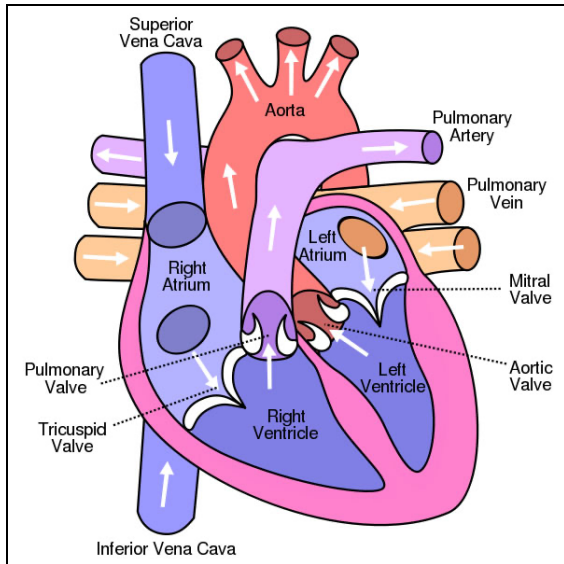
Peripheral IVs

First, we will look at peripheral IVs. According to the Cleveland Clinic, up to 80% of patients require peripheral IVs, as they can be used to draw or transfuse blood, as well as deliver IV fluids to ensure proper hydration.

Peripheral IVs are placed in areas of the body where it is easiest to access your veins, such as the hand or arm. The provider uses a needle to puncture the skin and leaves a cannula partially sticking out of the arm, where a tube is then connected. Next, a clear plastic dressing is placed on top. Once placed, a peripheral IV can remain intact for a few days, meaning you don't need multiple replacements (and you won't have to be poked with more needles). However, peripheral IVs are best used for short-term stays and treatments.

Central Venous Catheters

Next, we have central venous catheters, or CVCs. These may also be referred to as *central catheters*, *central venous access devices (CVADS)*, or *central vines*. These tubes are soft and flexible, and are usually inserted into large veins that end in or near the superior vena cava (a large vein that connects to the heart; see below).



Ports and Hickman ports are commonly placed into the neck, chest or groin, meanwhile PICC lines are often placed in the arms. CVCs may be used when patients (1) have fragile veins, or veins that are damaged or hard to locate, (2) are undergoing long term treatment, (3) cannot receive an IV via one or both arms, (4) need medication that is harmful if it leaks outside of a peripheral IV, or (5) need TPN (*total parenteral nutrition*).

The three most common types of CVCs are implanted ports, tunneled catheters, and PICCs.

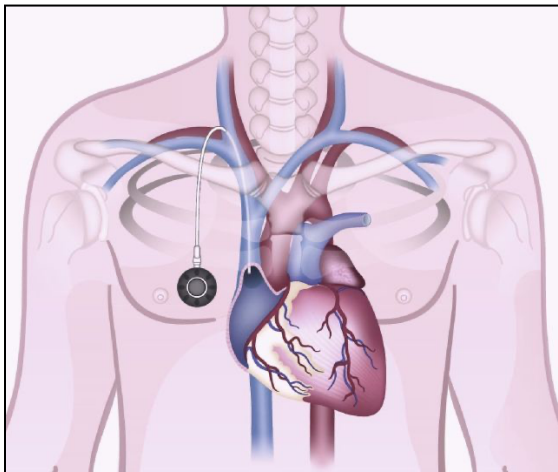
Implanted Ports

Implanted ports, aka *ports*, *Mediports*, or *port-a-caths*, are silicone tubes with small metal or plastic ports (containers) attached to them. They must be placed under the skin, usually in the chest, but sometimes in the arm or stomach.

Implanted ports are inserted by trained healthcare professionals, and therefore, they require a short surgical procedure to be initially placed, and another brief procedure

to be removed. Many times, interventional radiologists perform the procedure with X-ray technology to ensure that the port is correctly positioned and held in place. Local anesthetics are used to numb the area and minimize pain.

During this procedure, two incisions are made: one allows for the port to be placed, and the other allows the tube (catheter) to enter the vein. These incisions will be stitched and dressed, and will heal with time. After the surgery, you may notice that a small lump is left under the skin where the port was inserted. This is perfectly normal, as it is very superficial (close) to the skin.

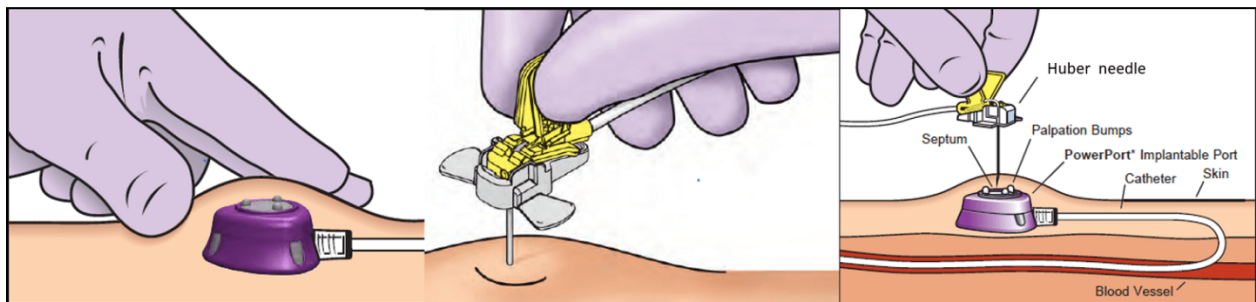


Once the incisions heal, normal activities like swimming and showering can be resumed.

When it is time to deliver medicine, nutrition, or fluids, the area of skin covering the port must be cleaned, and about thirty minutes prior to the treatment, a numbing cream should be applied to that same area. A needle is then used to “access” the port, which allows for a tube to be connected, and an infusion to occur. Single ports (single lumen ports) can be used when only one infusion is needed at a time, whereas double ports (double lumen ports) provide the option to have two infusions occurring simultaneously.

Implanted ports can stay under the skin for months or even years, but must be taken care of properly. While there are risks with implanted ports, it is always best to review these potential risks with your provider and take whatever precautions are deemed necessary. Some problems that could arise include blood clots, blocked ports, and infections.

Below is a great visual demonstrating how a port is accessed.



Tunneled Catheters

Tunneled catheters are also referred to as *Hickman*, *Groshong*, or *Broviac* catheters. What mainly differentiates the tunneled catheter from other catheters is its distinct insertion and exit sites. A tunneled catheter is inserted through a small incision in the chest or neck that leads to a vein, and it is then “tunneled” under the skin and exits through a separate incision.

Because of the exit site, part of the tunneled catheter sticks out of the skin, and it is held in place with the help of a few stitches. The reason for this is to minimize the risk of infection, and prevent it from being accidentally tugged at or completely pulled out.

It is important to know that tunneled catheters must be properly taken care of in accordance with the instructions of your provider. Most notably, tunneled catheters cannot get wet. They must be dressed (covered) before you take a bath, shower, swim, or get it wet in any other way. They must also be flushed (cleaned with a solution) before and after each use to prevent blockage.

Tunneled catheters can have between one to three lines, which is convenient for patients requiring more than one infusion. This saves a lot of time when multiple medications or fluids can be administered at the same time.

They can remain in place for weeks to months, but when it is time to remove the tunneled catheter, you must return to a nurse or doctor to have it safely taken out.

PICCs

Peripherally inserted central catheters, or PICCs, are lines placed in the arm that travel through a vein leading to the superior vena cava, which connects to the heart. PICC lines must be inserted by a healthcare provider.

Once placed, the end of the catheter will stick out of your arm, which is why a clear dressing is placed over it, so that it stays in place, doesn't interfere with everyday activities, and most importantly, isn't at risk of getting tugged or pulled out.

When using a PICC line, it is important to note that they cannot get wet. While it may seem inconvenient, they must be dressed (covered) before taking a bath or shower, or going for a swim.

PICC lines must be cleaned regularly. Before and after each use, the line should be “flushed.” This just means you need to clean it with a solution to keep it from getting clogged or blocked, which would require a replacement, and we want to avoid that as much as possible.

Notably, PICCs can support up to three infusions at once because they can have between one to three lines. This is especially great if taking multiple medications, or medications that cannot be combined with other fluids or substances.

PICCs can remain in your arm for as short a period as a few days, or up to many months. In order to remove a PICC line, you must return to your nurse or healthcare provider to do so.

Midline Catheters

And lastly, we’ll talk about midline catheters, which are similar to CVCs, except they do not extend all the way into the superior vena cava, and therefore, they are much shorter. Midlines are most often used when someone has fragile veins, as commonly seen in elderly patients, or when medication is only needed for a few days or weeks. A reason as to why a midline is favorable over a CVC is because there is a lower risk of infection in midlines.

Overall, there are many different options when it comes to vascular access devices. The most efficient way to determine which one works best for your particular needs is to consult with a medical professional. It is perfectly normal to try multiple catheters before you find the right fit for your body and lifestyle. What matters most is that your catheter safely and effectively delivers nutrition, hydration, and or medication through your bloodstream, without involving the digestive system.

While the Fighting H.A.R.D. Foundation is happy to provide the above information on parenteral nutrition and vascular access devices, we would once again like to remind you that this is for educational purposes, and that we are not licensed medical professionals. Please consult with a doctor, nurse, PA, or other provider as necessary before making any decisions related to your health.

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