Hemodialysis
When you have kidney failure your body cannot get rid of waste products and excess fluid. Instead, these build up in your blood. Hemodialysis is one way to filter wastes and remove excess fluid from your blood. It uses an artificial kidney called a dialyzer. During treatment, some of your blood flows through the dialyzer where it is filtered and then clean blood is returned to your body.

If you choose hemodialysis, you will need a vascular access. This is the passageway that allows blood to safely leave your body, travel to the dialyzer, and return to your body. A vascular access is usually placed in your arm, leg, neck, or chest.

You have two kinds of blood vessels in your body: arteries and veins. Arteries are large, strong vessels that carry oxygen-rich blood from your heart and lungs to the rest of your body. Veins carry blood back to your heart and lungs to pick up more oxygen.

The vascular access is like a freeway exit ramp: it allows a portion of your blood to be diverted from your artery to the dialyzer while the remaining blood continues on the highway to other tissue. Clean blood from the dialyzer returns to your body through the vascular access into your vein and rejoins the blood circulating in your body.

Types of Vascular Access
Before starting dialysis, a vascular surgeon will perform a minor surgery to create a vascular access for you. There are three types of vascular access:

- Fistula
- Graft
- Catheter
**Arteriovenous (AV) Fistula**

A fistula, or AVF, is made during minor out-patient surgery by connecting one of your veins to a nearby artery. After the vein and artery are connected, the stronger arterial blood flow passing through the vein makes the vein larger and stronger. Before a fistula is created, your veins are mapped to determine the best location for the fistula; most are placed in the lower or upper arm. It usually takes a few months for the fistula to properly develop and be ready to use for hemodialysis treatments.

The National Kidney Foundation (NKF), Centers for Medicare and Medicaid Services (CMS), and other organizations and experts agree that AV fistulas are the best type of vascular access, especially for long-term hemodialysis. Low rates of complications, clotting and infection all contribute to the fistula’s reputation as the “gold standard” for vascular access.

**AVF Pros**
- The “gold standard”
- Lasts longer than other access types, usually many years (20+)
- Fewer infections than grafts or catheters
- Needs fewer follow-up procedures to keep it working (may need 2-3 procedures over 20 years)
- Increased blood flow means more effective dialysis treatment
- Less tendency to clot than catheters or grafts
- Natural tissue; needle insertion sites heal and self-repair

**AVF Cons**
- Visible as a bulge under the skin that some people feel is unattractive
- May take several months to develop and be ready to use; may not mature
- May require temporary access while AVF matures
- Not possible for all patients due to inadequate or damaged veins, or other medical conditions

**Arteriovenous Graft**

A graft, or AVG, is a small soft artificial (synthetic) tube placed under the skin to connect an artery and a vein. Grafts can be placed in an arm or leg, but are most often placed in the forearm.

**AVG Pros**
- Implanted with minor outpatient surgery
- Can be used for treatment sooner than a AVF, usually within 3-4 weeks

**AVG Cons**
- Usually lasts only 3-5 years (compared to 20+ years for an AVF)
- More likely to get infected than a AVF
- More likely to have blood clots than a AVF
- May require 2, 3 or more follow-up procedures per year for clotting problems or infection
- Synthetic graft material may wear out with repeated needle insertions and graft will require replacement
- Longer bleeding time than an AVF after dialysis needles are removed
Venous Catheter

A catheter is a small, Y-shaped plastic tube that is inserted into a large vein in the neck, chest, or groin. The top part of the catheter hangs outside the body and the bottom part sits in a vein near the heart. Because catheters have the potential for many complications, they are most commonly used as a temporary access for emergency or short-term dialysis treatment.

Catheter Pros

• Dialysis can be performed immediately after insertion
• Easy removal and replacement

Catheter Cons

• Highest infection rates; direct access to heart often results in more serious (life-threatening) infections
• Clot more frequently, may cause narrowed veins
• Difficult to obtain sufficient blood flow to allow for effective removal of wastes
• Bathing and swimming is not recommended due to infection risk
• Not for permanent access

Get the facts before making this decision!

Talk to your doctor about your options for vascular access, especially about an AV fistula. This will be your “lifeline” for hemodialysis, and it is important to make sure you have the best possible vascular access.

If you will be starting hemodialysis within the next year and do not have an access yet:

• Protect your non-dominant arm (the one you don’t write with). Don’t let anyone take your blood pressure, draw blood, or start an IV on that arm. These steps can improve your chances of having a good access.

• Ask your doctor to refer you to a surgeon who has experience placing fistulas.

• Have vessel mapping done on both arms to see if you are a candidate for a fistula.

• If one doctor says you are not able to have a fistula, ask for a second opinion.

• When you are scheduled for fistula surgery, tell your surgeon you do not want a graft or catheter substituted without your permission.

• If you choose a fistula, make sure to schedule your surgery at least 6 months before you expect to start hemodialysis.

For more information contact your nephrologist or primary care practitioner!