

# Dialysis Vascular Access: What Every Patient Should Know

This webinar will start shortly. The slides and the webinar recording will be available at [www.dpcedcenter.org](http://www.dpcedcenter.org)

**Next webinar: September 24th**

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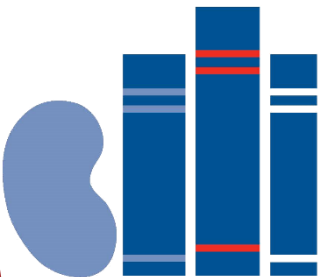
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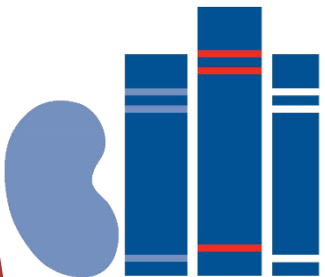
# Today's Presenter

- ▶ David L. Mahoney MD FASN  
FASDIN
- ▶ Chief Medical Officer,  
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- ▶ Former Chief Medical  
Officer, Lifeline Vascular  
Care



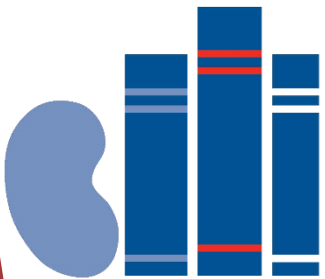
# Learning Objectives

- ▶ Describe the functions that dialysis performs when kidneys fail
- ▶ Discuss the different types of dialysis
- ▶ Review how a hemodialysis machine works
- ▶ Explain why a vascular access is necessary for hemodialysis
- ▶ Demonstrate the different types of dialysis vascular access
- ▶ Explain why catheters are the least preferable form of access
- ▶ Review important things to know about fistulas and grafts



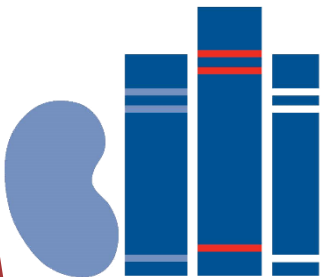
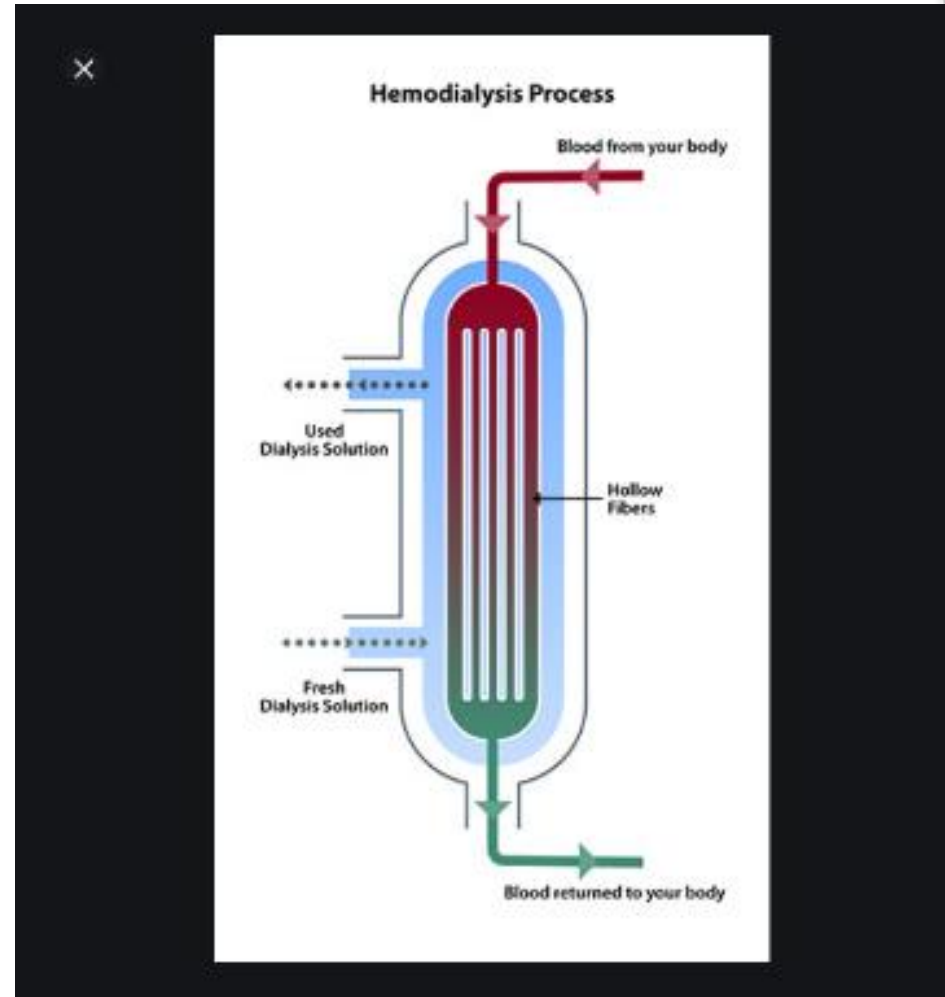
# Brief Overview of Dialysis

- ▶ Removes waste from the blood
- ▶ Restores normal fluid balance to the body
- ▶ Corrects abnormalities in blood chemistry
- ▶ May be performed by hemodialysis or peritoneal dialysis
- ▶ Is far less efficient than normal kidney function
- ▶ Requires a true team approach for effective therapy



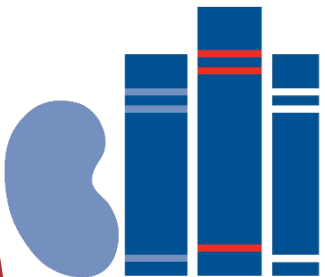
# How a Hemodialysis Machine Works

- ▶ Blood flows from your body, is pumped to the dialysis filter where it passes through thousands of tiny fibers
- ▶ Fluid called dialysate passes on the outside of the fibers, flowing in the opposite direction to the blood
- ▶ Tiny pores in the fibers of the filter permit water, waste, and other chemicals to pass out of the blood and be discarded



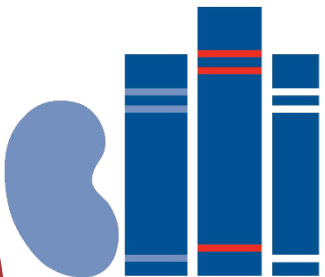
# Why Is a Vascular Access Necessary?

- ▶ The dialysis process usually requires a blood flow rate of over 350 cc per minute (about 12 ounces)
- ▶ Even if we have large and prominent superficial veins, they do not have an adequate blood flow rate to permit dialysis
- ▶ A vascular access allows for blood to be removed from and returned to the body at a rate sufficient to allow for effective dialysis



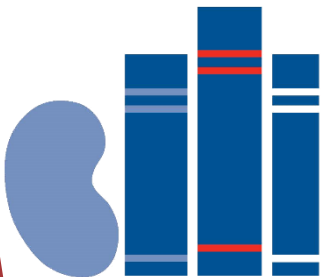
# Kidney Disease Outcomes Quality Initiative (KDOQI)

- ▶ The organization studies the practice of kidney care and establishes guidelines to promote better care, improved health, and greater safety for patients with kidney disease
- ▶ Periodically KDOQI publishes a guideline for dialysis vascular access; the most recent was published in April 2020
- ▶ The updated guideline contains substantial changes aimed at patient-centered care and can be summarized as, “The Right Access for the Right Patient for the Right Reason at the Right Time”
- ▶ Patients should take an active role in planning their healthcare and achieving the best possible vascular access



# Types of Dialysis Vascular Access

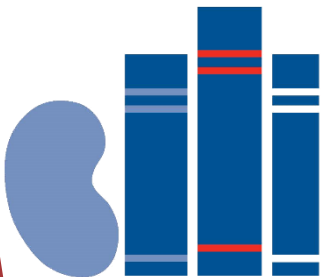
- ▶ Central Vein Catheter
- ▶ Arterio-venous Graft
- ▶ HeRO Device
- ▶ Arterio-venous Fistula





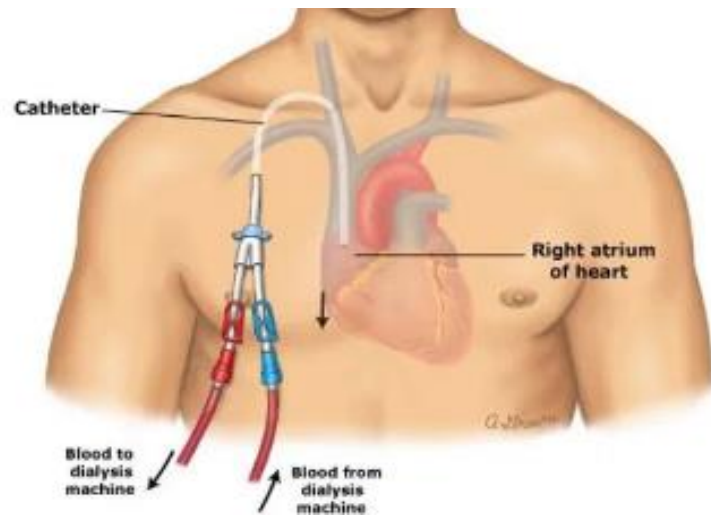
# Central Venous Catheters

- ▶ Also referred to as “CVCs”
- ▶ Over 80% of new dialysis patients start with a CVC
- ▶ May be tunneled or non-tunneled
- ▶ Associated with significantly higher rates of infection, hospitalization and other complications
- ▶ Often referred to as “the little white tube of death”
- ▶ Is the appropriate form of vascular access for a tiny fraction of patients

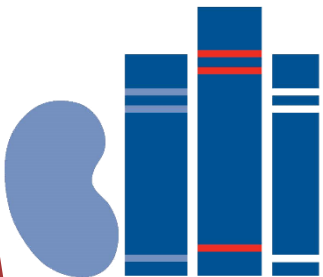
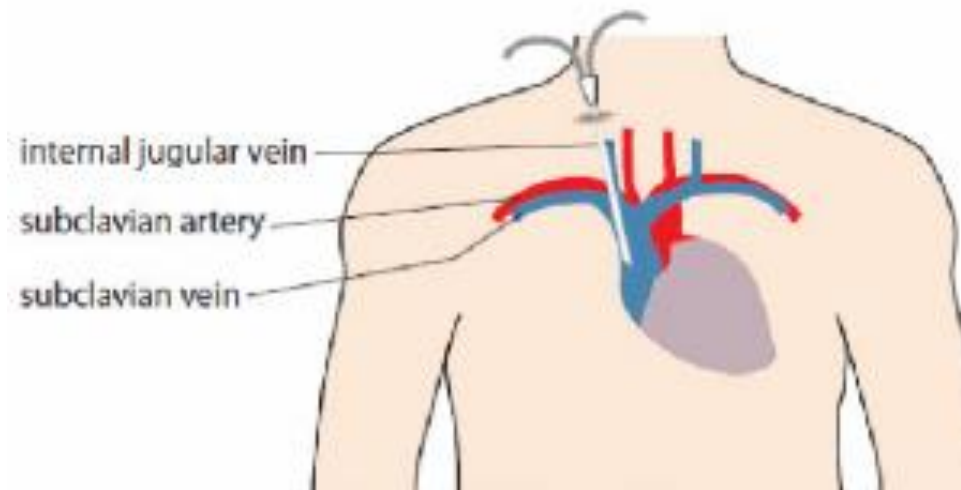


# Tunneled and Non-Tunneled CVCs

## Tunneled

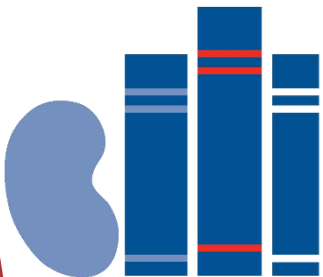


## Non-Tunneled

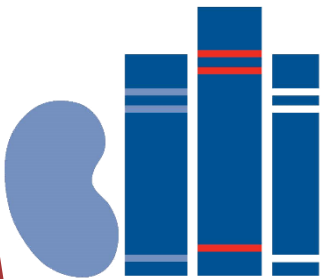
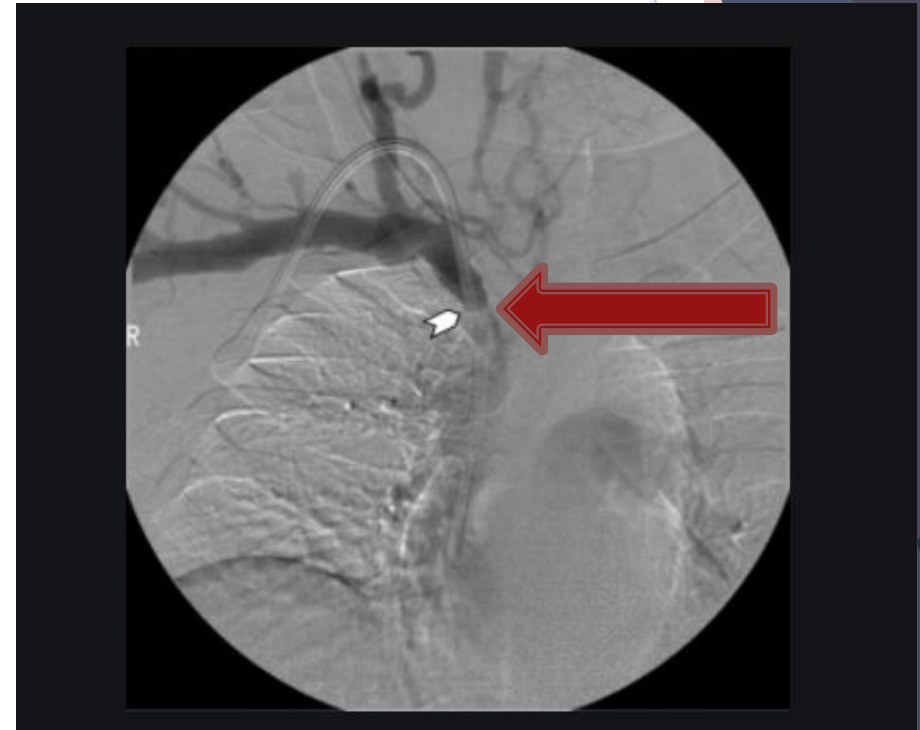
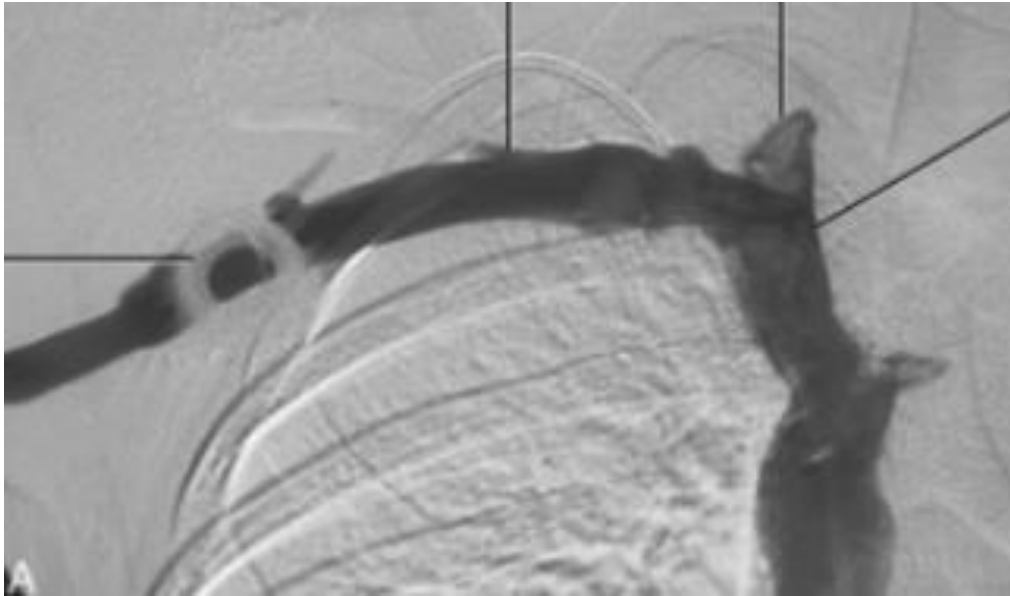


# Why Are CVCs So Bad?

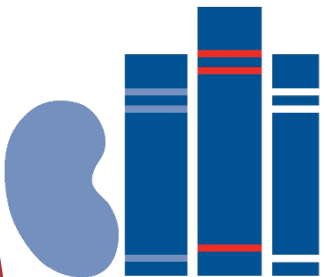
- ▶ The blood stream infection rate with a CVC is more than 10 times higher than with a graft or fistula
- ▶ The tip of the catheter sits inside the atrium (top chamber) of the right side of the heart and can lead to infections of the heart and blood clots in the heart
- ▶ Catheters frequently function poorly due to clotting or fibrin formation
- ▶ CVCs cause inflammation and narrowing of veins and can lead to massive arm swelling. This may prevent placing a graft or fistula later
- ▶ Patients with CVCs cannot shower or swim
- ▶ Patients with CVCs show a much shorter survival on dialysis



# Central Vein Stenosis

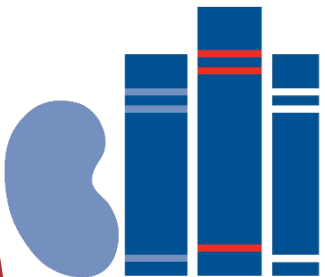


# Upper Extremity Edema Due to Central Vein Stenosis (Narrowing) Caused by a Catheter

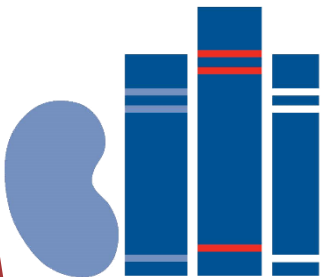
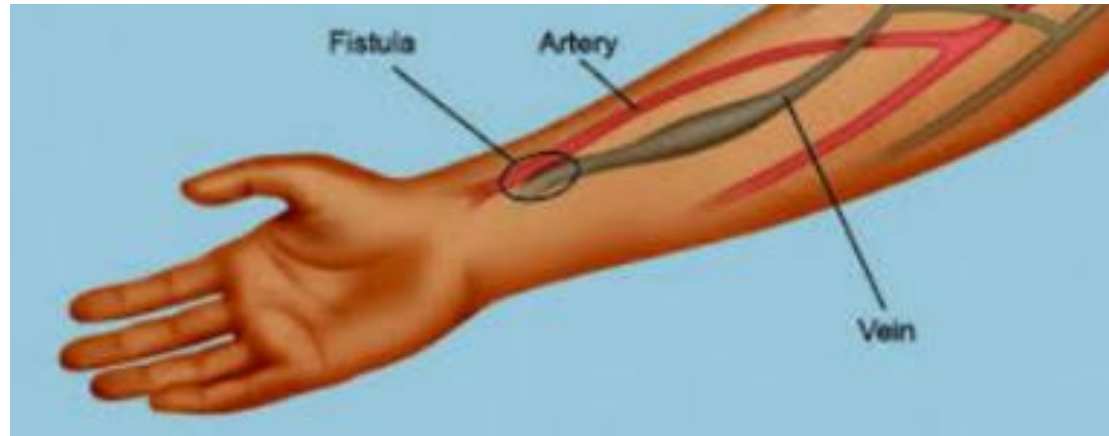


# Arterio-venous Fistulas

- ▶ Also known as AV fistulas or simply fistulas
- ▶ Created by connecting a vein directly to an artery
- ▶ No foreign material remains in the patient
- ▶ May require more than one surgery to create
- ▶ Have the fewest infections and complications
- ▶ Ideally are placed and fully developed before starting dialysis
- ▶ Are the preferred hemodialysis vascular access



# Traditional AV fistulas

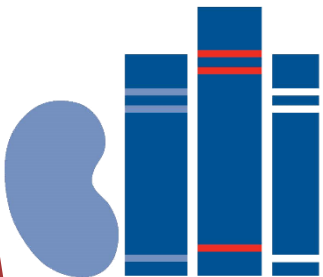


# Monitoring Your Fistula



## Look, Listen, Feel

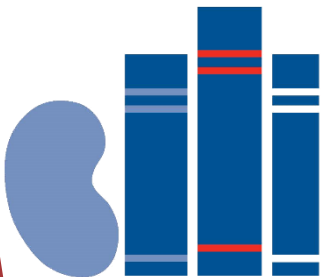
- ▶ Look for redness or other signs of infection. Identify any areas that are not healing (scabs, drainage). Report any shiny skin or change in the appearance of your fistula
- ▶ Listen - There should be a constant “whooshing” sound that rises and falls but does not whistle or have a high pitch
- ▶ Feel - There should be a constant vibration like a cat’s purr. A hard pulse or hammering feeling is abnormal and should be reported



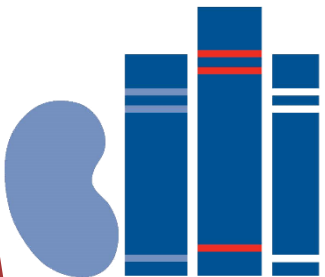
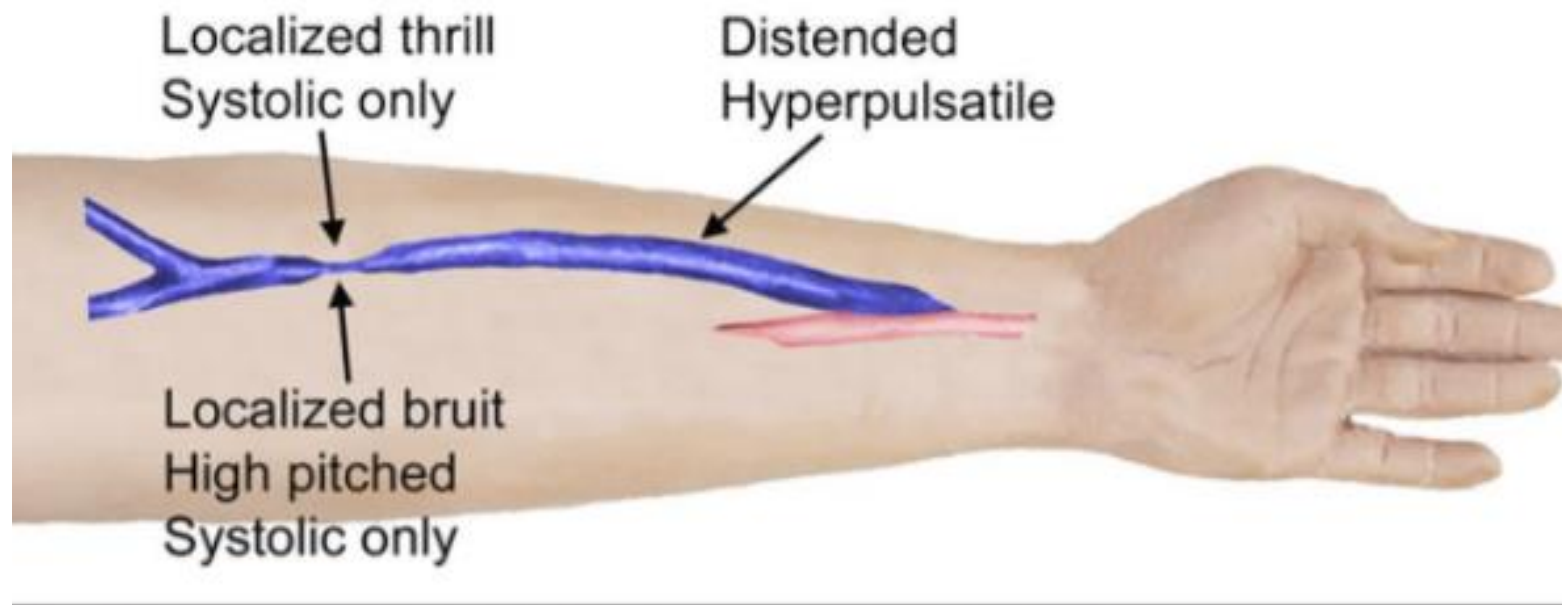


# Indications That Your Fistula May Have a Problem

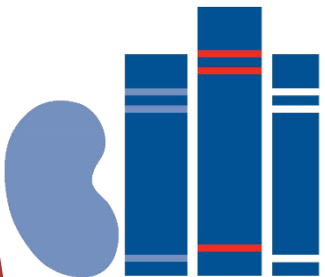
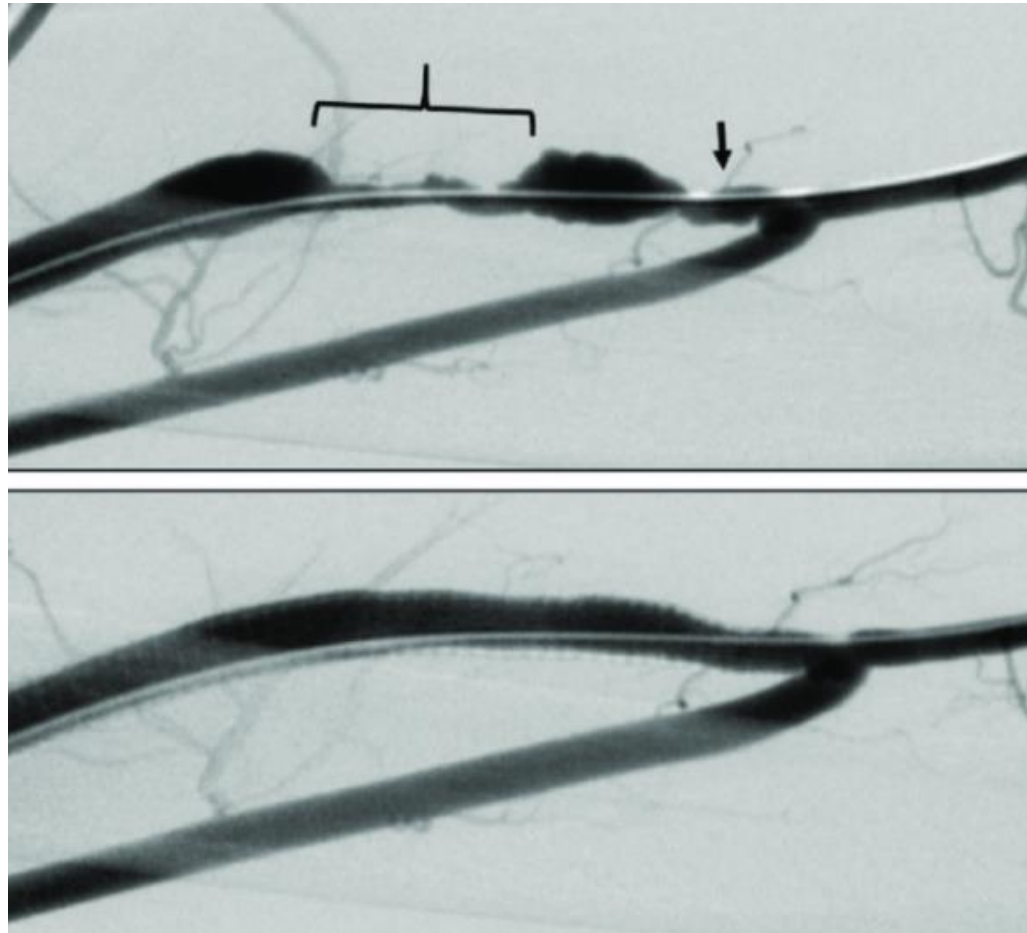
- ▶ Difficulty placing dialysis needles
- ▶ Frequent pressure alarms by the dialysis machine during treatment
- ▶ Prolonged bleeding when needles are removed
- ▶ Decreased efficiency of dialysis (reported as URR or Kt/V in your dialysis lab testing) with no change in your dialysis prescription
- ▶ Pain or swelling in the fistula arm
- ▶ Enlargement of the fistula vein with irregular bulges



# Access Stenosis

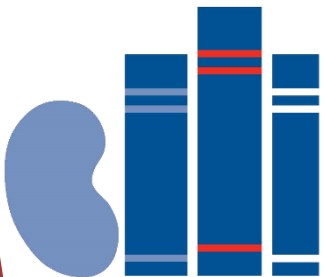


# Stenosis - Radiologic Appearance and Angioplasty (Balloon Dilatation)

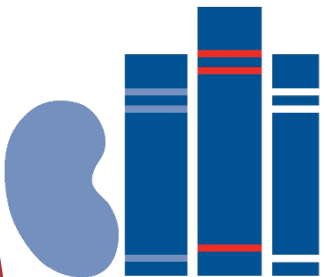
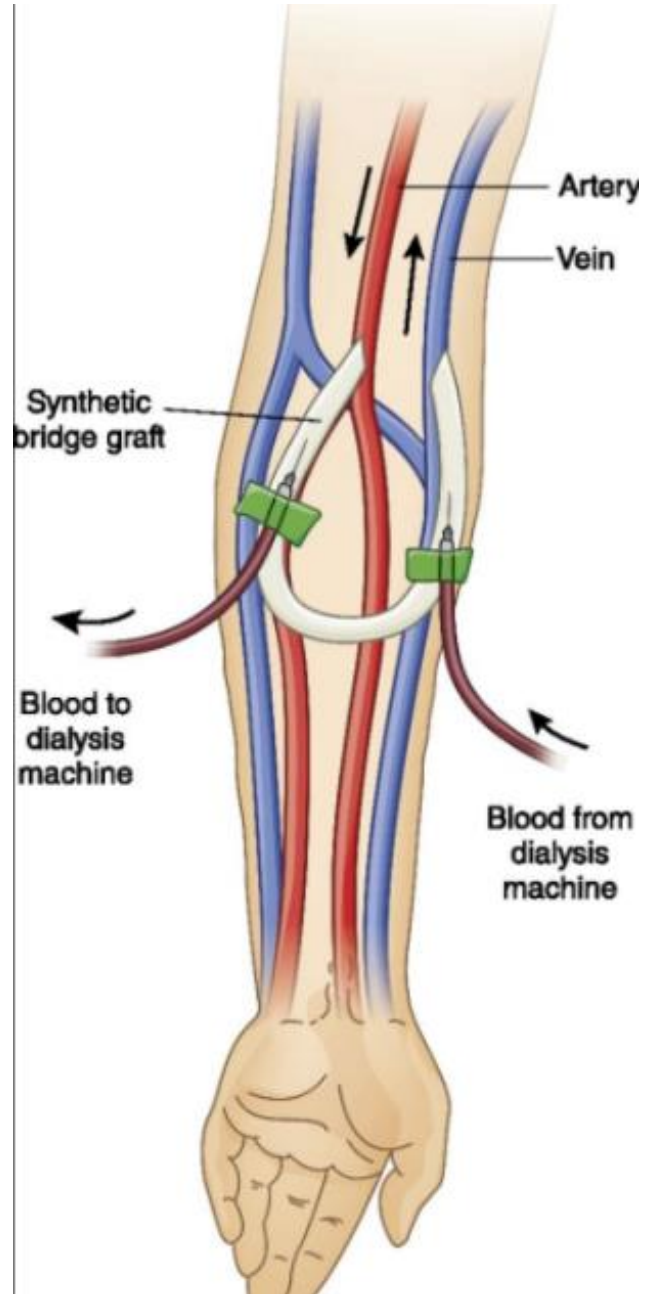


# Arteriovenous Grafts

- ▶ Also called AV Grafts or Grafts
- ▶ May be an excellent option if the patient has poor veins for creating a fistula
- ▶ Involves placing a synthetic blood vessel to connect an artery and a vein
- ▶ Most commonly placed in the arm but can be placed in the thigh or chest
- ▶ Several different graft materials are available

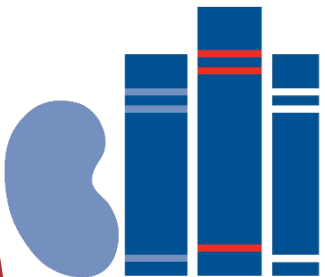


# AV Grafts



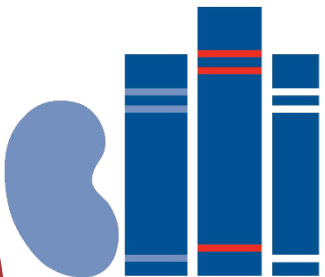
# Benefits of AV Grafts

- ▶ May generally be used within 2 weeks of placement
- ▶ Do not require a maturation period
- ▶ Are an excellent option for patients with poor veins
- ▶ If placed in the forearm can lead to maturation of upper arm veins and future fistula creation
- ▶ With proper care can function and last for many years

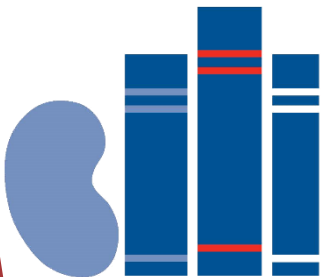
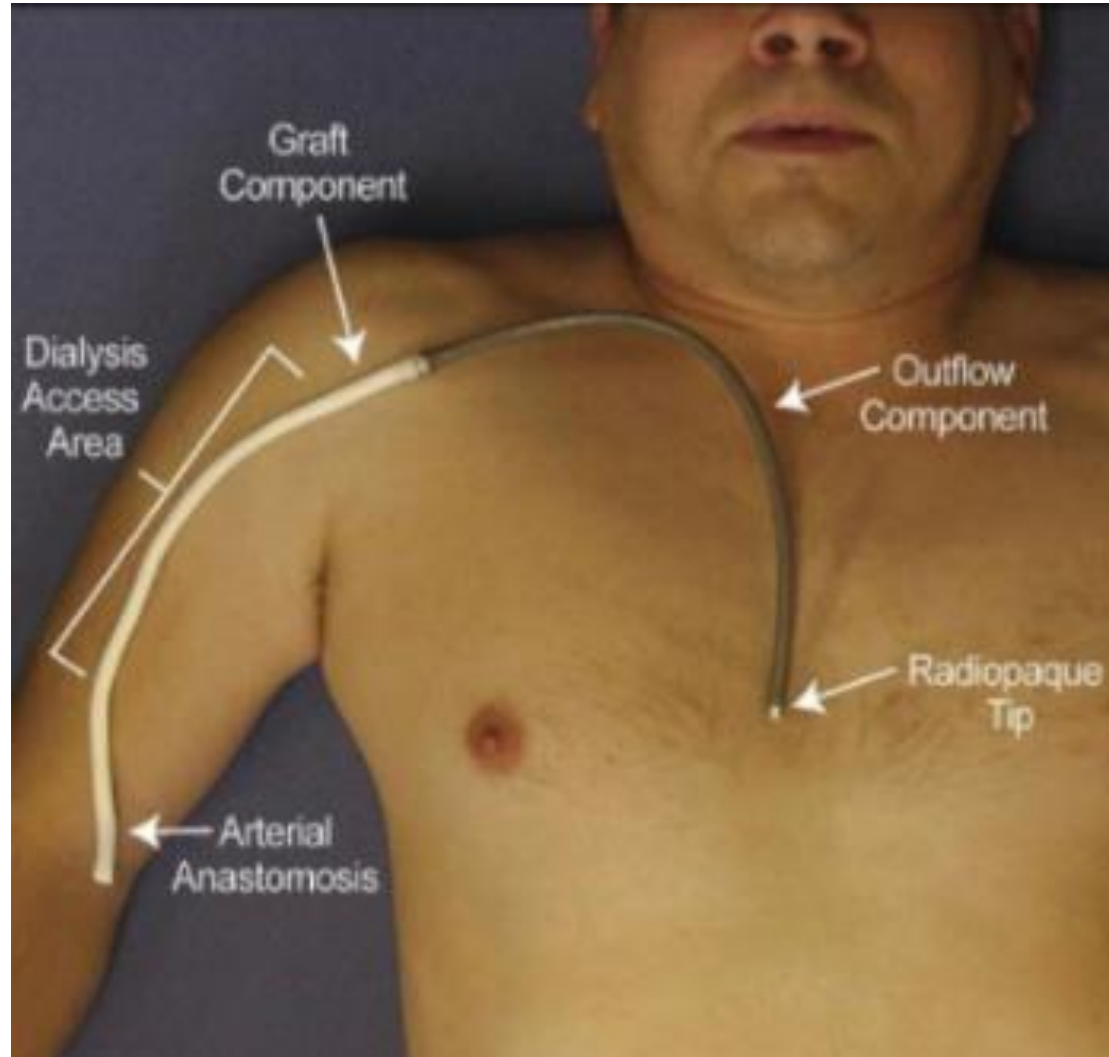


# HeRO Graft

- ▶ Used when patients have not had successful function of a fistula or graft
- ▶ Commonly necessary if the patient has developed central vein stenosis (narrowing) that prevents good blood return to the heart
- ▶ Consist of a graft in the arm with a central conduit or tube that continues directly to the heart
- ▶ An excellent option for patients who previously could not have a fistula or graft due to central vein occlusion (blockage)



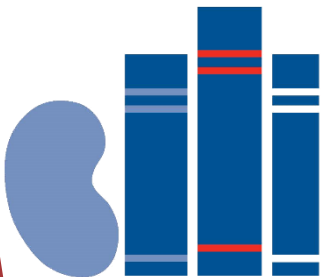
# HeRO Graft





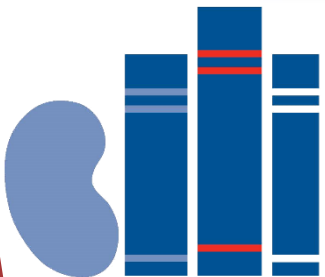
# Key Concepts to Remember

- ▶ You must take an active role in the care of your vascular access
- ▶ Examine your access each day by “Look, Listen and Feel” and report any changes to your dialysis team
- ▶ Whenever possible, replace a CVC with a permanent vascular access
- ▶ If your first fistula surgery is not successful, be persistent. Most fistulas require more than one surgery before they are ready to use, but they have far fewer complications in the long run
- ▶ Take advantage of available resources - Dialysis Patient Citizens, the National Kidney Foundation, American Association of Kidney Patients and your dialysis provider



# Questions?

**Please use the chat box to ask your questions**



# Thank You for Attending Today!

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**Our September 24<sup>th</sup> webinar  
will be in Spanish on Managing  
Blood Glucose**

