

# Ultrasound Guided Vein Procedures

Bryan Williams MHA, RT(R), RDMS, RVT, RDCS

---

---

---

---

---

---

---

---

## Objectives

- Review what normal and abnormal veins look like on ultrasound
- Review some of the ultrasound guided vein procedures performed at our Vein Center

---

---

---

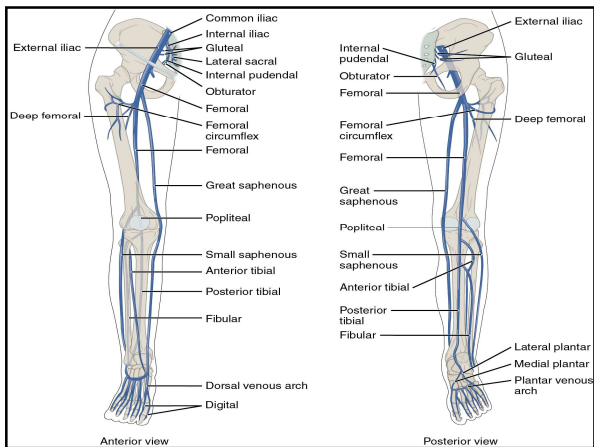
---

---

---

---

---



---

---

---

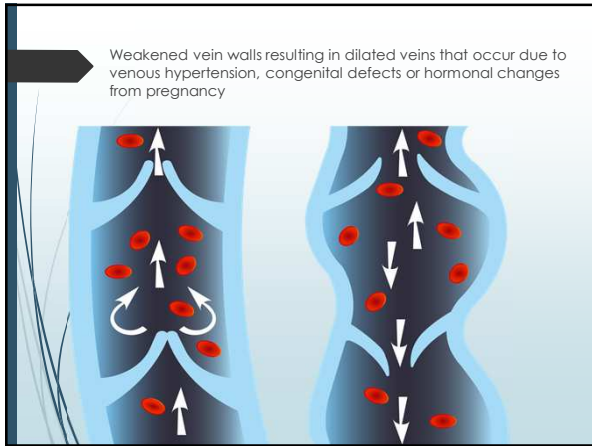
---

---

---

---

---



---

---

---

---

---

---

---

---

### Why do we need ultrasound

- This is pretty self explanatory, but I will show you the importance of ultrasound in catheter placement and vein access.
- Who performs the ultrasound: Physician or Sonographer.
  - Is there a preference?

---

---

---

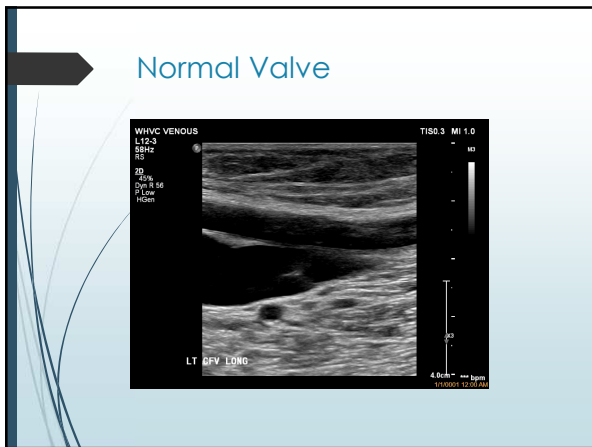
---

---

---

---

---



---

---

---

---

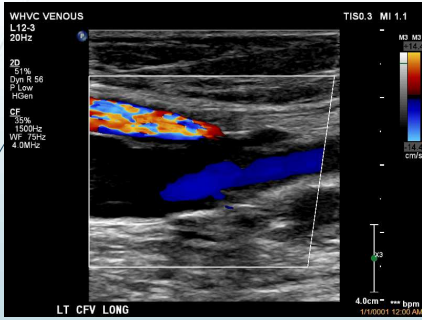
---

---

---

---

### Normal Valve



---

---

---

---

---

---

---

---

### Abnormal Valve



---

---

---

---

---

---

---

---

### Abnormal Valve



---

---

---

---

---

---

---

---

### Ablation Procedure (Ultrasound)

- After the patient is prepped and all equipment is setup a probe cover is used to introduce the ultrasound probe into the sterile environment.
- Survey the vein of interest to look for any potential issues with catheter insertion.
- Look for an ideal location to access the vein.
- Note this is done by an ultrasound tech or physician depending on the physician performing the procedure.

---

---

---

---

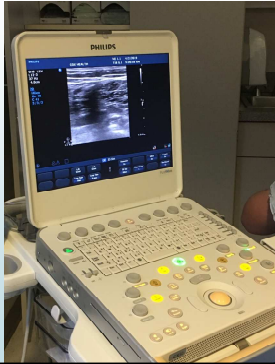
---

---

---

---

### What machine do we use?



---

---

---

---

---

---

---

---

### Patient Prep



---

---

---

---

---

---

---

---

### Patient Prep



---

---

---

---

---

---

---

---

### Patient Prep



---

---

---

---

---

---

---

---

### Ultrasound guidance

- Survey of the gsv starting at the groin continuing to below the knee noting any areas that may be problematic for the passing of the RFA catheter
- Also evaluate for any accessory branches that may not be included in the treatment of the gsv

---

---

---

---

---

---

---

---

### Patient Prep



---

---

---

---

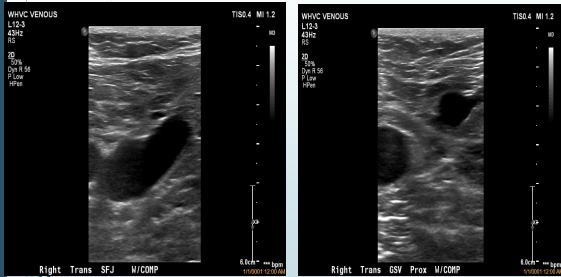
---

---

---

---

### Prox GSV



---

---

---

---

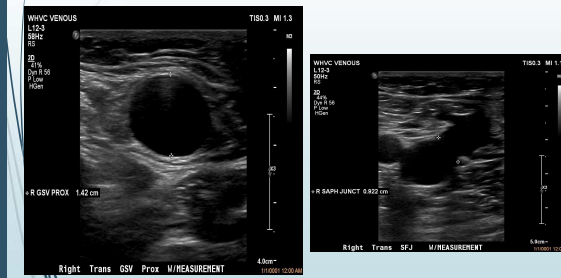
---

---

---

---

### Prox GSV



---

---

---

---

---

---

---

---

### Enlarged Varicosity



---

---

---

---

---

---

---

---

### What if we find issues?

- ▶ If you find large varicosities or tuftous areas it could change our approach.
- ▶ We could change the location of access to avoid these areas.
- ▶ We could change tactics by treating two separate segments.
- ▶ We could do phlebectomies along with the ablation procedure.

---

---

---

---

---

---

---

---

### Right SFJ



---

---

---

---

---

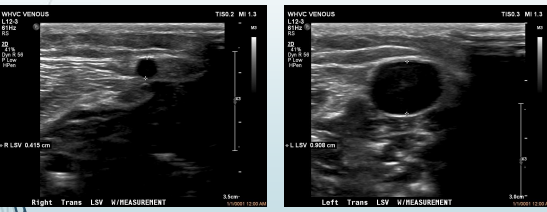
---

---

---

Identify the SSV

Right SSV                      Left SSV



Right Trans LSV M/REASUREMENT      Left Trans LSV M/REASUREMENT

---

---

---

---

---

---

---

---

Identify the SSV



Right Trans LSV M/COMP      Right Trans LSV M/REASUREMENT

---

---

---

---

---


---

---

---

Ablation Procedure (Ultrasound)

- Once ready to access the vein:



---

---

---

---

---

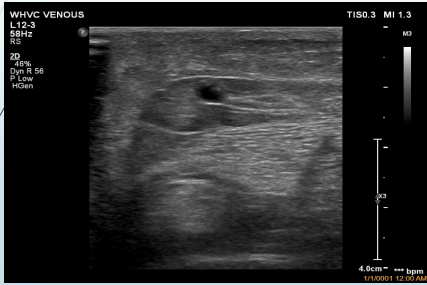
---

---

---



Once the physician chooses the access point the vein is held in the transverse plane to allow visualizing of the access needle into the center of the lumen



---

---

---

---

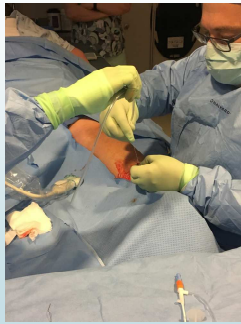
---

---

---

---

### Catheter Placement



---

---

---

---

---

---

---

---

### Catheter Placement



---

---

---

---

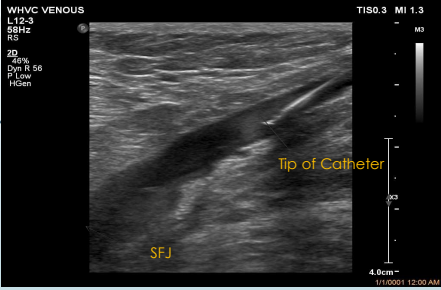
---

---

---

---

After placement of the catheter within the vein, the SFJ is visualized in the long access to aid in placement of the catheter approximately 2 cm from the CFV to avoid a heat induced thrombus



WHVC VENOUS  
L12-3  
58Hz  
15  
2D  
59cm  
Dyn R 56  
Fl Low  
HGen

TISO.3 MI 1.3  
MS

4.0cm  
4/8/2019 12:00 AM

---

---

---

---

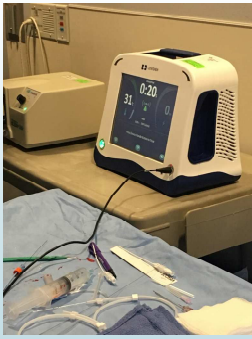
---

---

---

---

Catheter placement



---

---

---

---

---

---

---

---

Tumescent

- Once the catheter is in place it is scanned in the transverse plan from access point to the tip during the injection of the saline, lidocaine and epinephrine mixture
- This insures complete coverage of the catheter with a bull's-eye appearance to have proper insulation, as well as compressing the walls of the vein to provide proper contact with the catheter during treatment

---

---

---

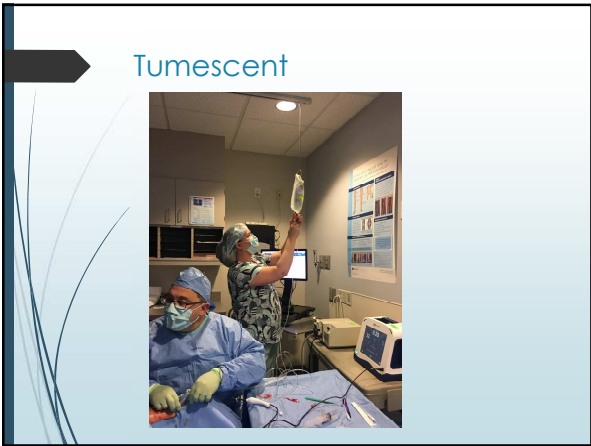
---

---

---

---

---



---

---

---

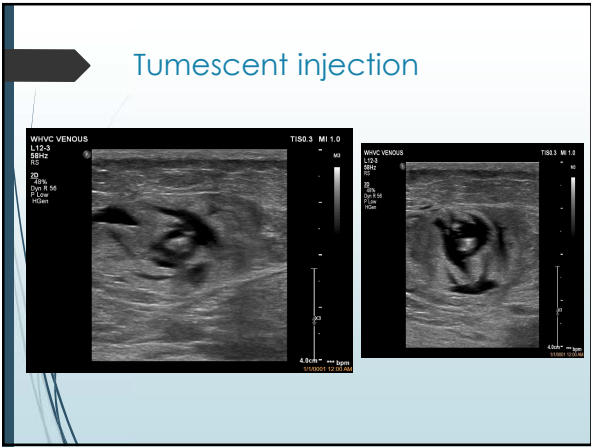
---

---

---

---

---



---

---

---

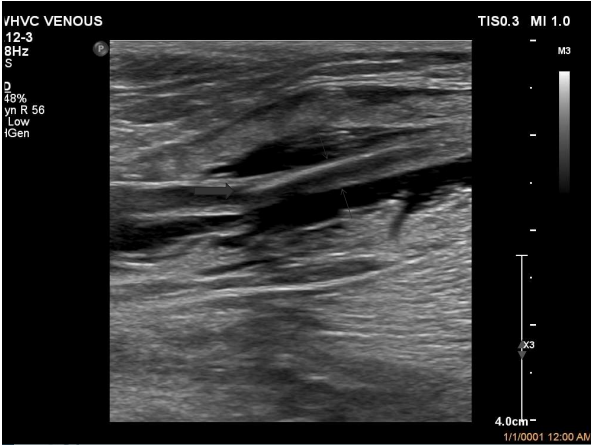
---

---

---

---

---



---

---

---

---

---

---

---

---



---

---

---

---

---

---

---

---

### Mechanochemical Ablation (MOCA)

- ClariVein<sup>®</sup>C is introduced percutaneously into the peripheral vasculature under imaging guidance\*.The catheter tip is easy to visualize for accurate placement in the treatment zone^.
- Mechanochemical Ablation:** ClariVein<sup>™</sup> One of the newest **endovenous ablation** technologies, ClariVein<sup>™</sup> combines two approaches – mechanical destruction of the vein and a sclerosing agent – to treat bulging **varicose** veins and their underlying causes. ClariVein uses a special catheter with a rotating tip.

---

---

---

---

---

---

---

---

### MOCA

The image shows the ClariVein MOCA catheter, which consists of a long, thin, flexible catheter with a rotating tip, connected to a white and blue handpiece.

---

---

---

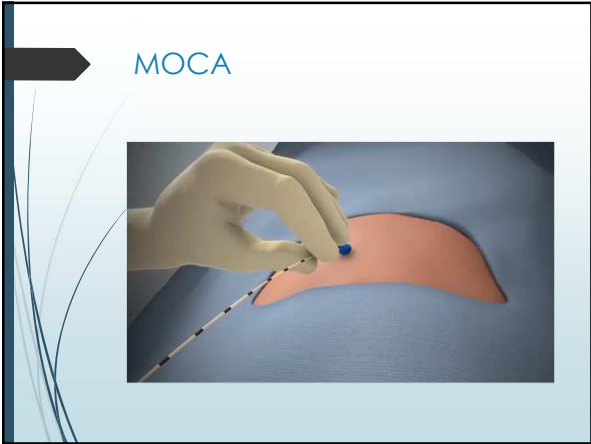
---

---

---

---

---



---

---

---

---

---

---

---

---



---

---

---

---

---

---

---

---

Why chose this?

- This allows us to treat areas without using heat. This avoids damage of the saphenous nerve
- Patients love the fact that we don't have to use tumescent.

---

---

---

---

---

---

---

---

### Ultrasound guided sclero

- ▶ Ultrasound is used to identify the diseased vein for needle access.
- ▶ This targets the veins that can be treated by sclero, but can't be visualized on the skin.
- ▶ This can be used for perforators or other problem vein segments.

---

---

---

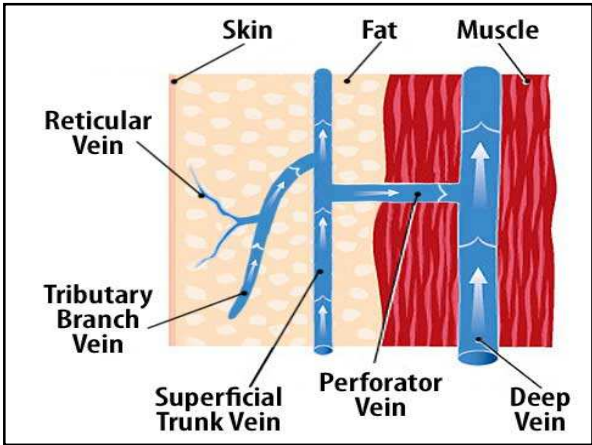
---

---

---

---

---



---

---

---

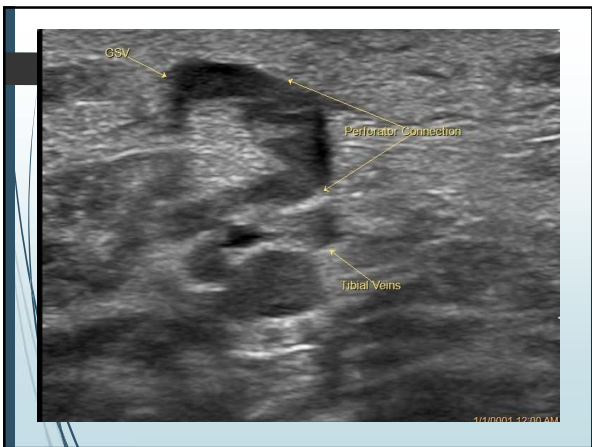
---

---

---

---

---



---

---

---

---

---

---

---

---



---

---

---

---

---

---

---

---

### Post Ablation Ultrasound

- Insure closure of the treated vein and affected branches
- Insure absence of an endothermal heat induced thrombosis (EHIT) extending into the deep system
- EHIT classifications
  - Class I: Thrombosis at the superficial junction (SFJ,SPJ)
  - Class II: Non occlusive thrombosis extending into the deep system at an area of less than 50%
  - Class III: Non occlusive thrombosis extending into the deep system at an area greater than 50%
  - Class IV: Occlusive thrombosis of the deep system

---

---

---

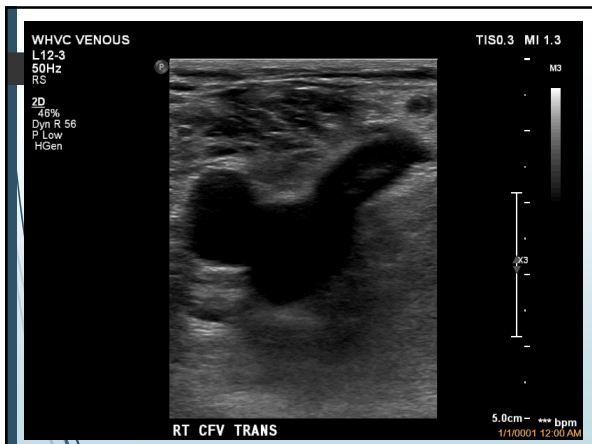
---

---

---

---

---



---

---

---

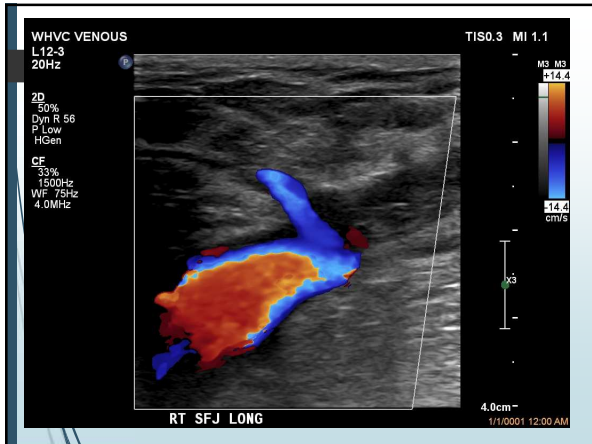
---

---

---

---

---



---

---

---

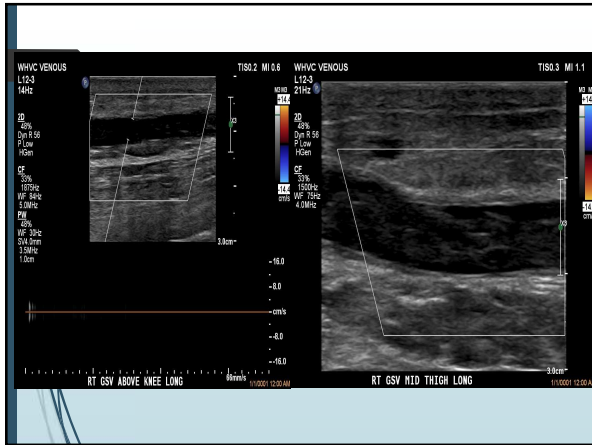
---

---

---

---

---



---

---

---

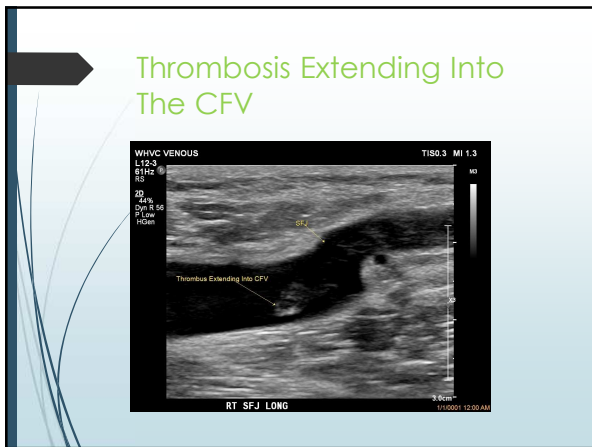
---

---

---

---

---



Thrombosis Extending Into The CFV

---

---

---

---

---

---

---

---





---

---

---

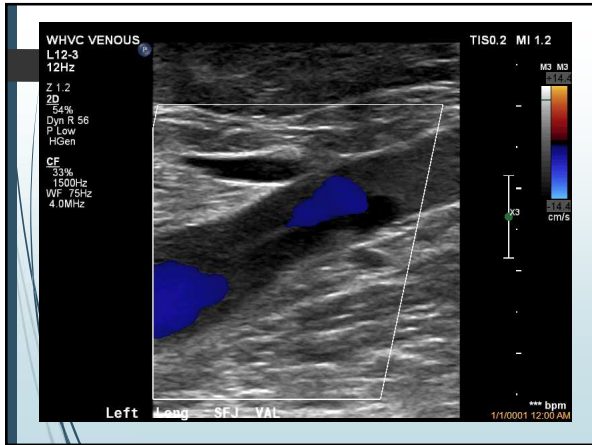
---

---

---

---

---



---

---

---

---

---

---

---

---

### References

- Eberhardt, R. T., & Raffetto, J. D. (2005). Chronic Venous Insufficiency. *Circulation*, 111(18). doi: <https://doi.org/10.1161/01.CIR.0000164199.72440.08>
- Elias, S., MD, & Khilnani, N., MD. (2008, August). Treating the Small Saphenous Vein. *Endovascular Today*, 60-64.
- Min, R. J., MD, & Khilnani, N. M., MD. (2003). Duplex Ultrasound Evaluation of Lower Extremity Venous Insufficiency. *Journal of Vascular and Interventional Radiology*, 14(10), 1233-1241. doi: <http://dx.doi.org/10.1097/01.RVI.0000092663.72261.37>

---

---

---

---

---

---

---

---