

# **Dr Justin Bowra**

## **CCUS Manual:**

### **Appendix 2:**

# **A quick guide to DVT compression US**

Adapted from:

- Emergency Ultrasound Made Easy 2nd ed (in press), Justin Bowra & Russell McLaughlin
- Diagnostic Ultrasound, 3rd ed, Rumack, Wilson, Charboneau and Johnson
- DVT ultrasound course, Justin Bowra

- Standard B-mode soft tissue settings
- Linear transducer, high-frequency (5.0–7.5 MHz) is usual
- But curved probe is adequate if you're in a hurry.

## B-mode compression US

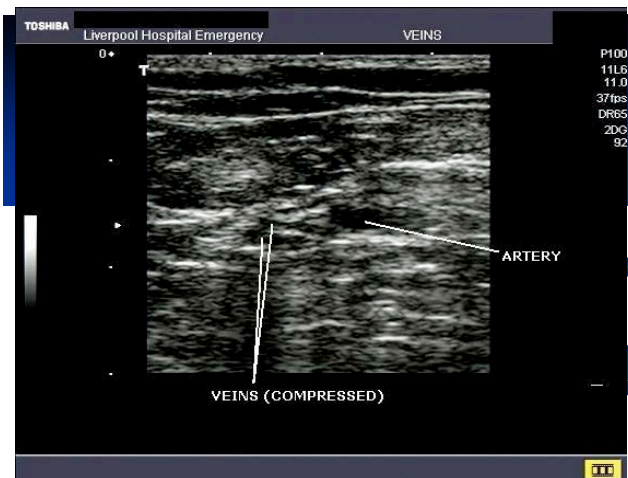
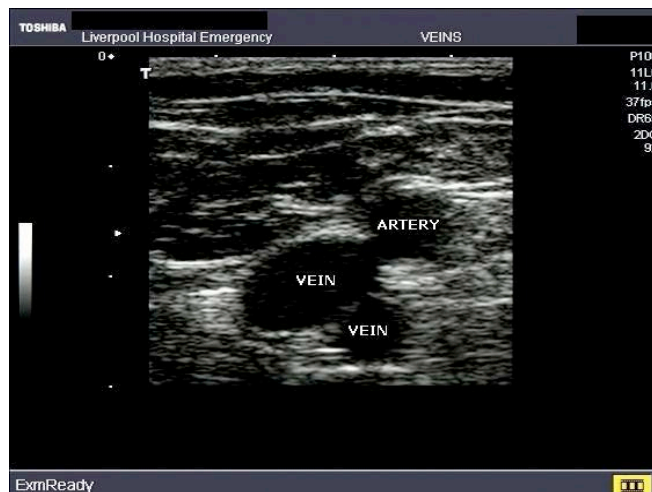
Compression US is simple:

1. Rest the probe lightly on the skin.
2. Find the vein in transverse view (don't image in the long axis, because the probe may 'slip off' and give a false impression of compression.)
3. ID the vein and artery:
  - a. Artery (thick-walled) and pulsates
  - b. Vein thinner-walled, transmitted pulsation only.
4. With the probe (or sometimes with your other hand eg when compressing the femoral vein just above the adductor hiatus), gently compress the vein so that its anterior and posterior walls appose; you'll find the adjacent artery relatively incompressible. **This is B-mode compression US.**

NB The key is to cease compressing when the artery's walls just begin to indent. If the vein is not compressed with this amount of pressure, it's abnormal.

*Doppler imaging increase the accuracy of DVT US, esp when used in combination with techniques such as flow augmentation and Valsalva manoeuvre. But that's beyond the scope of this brief introduction to DVT scanning.*

### Normal veins 'completely squash' with probe pressure.



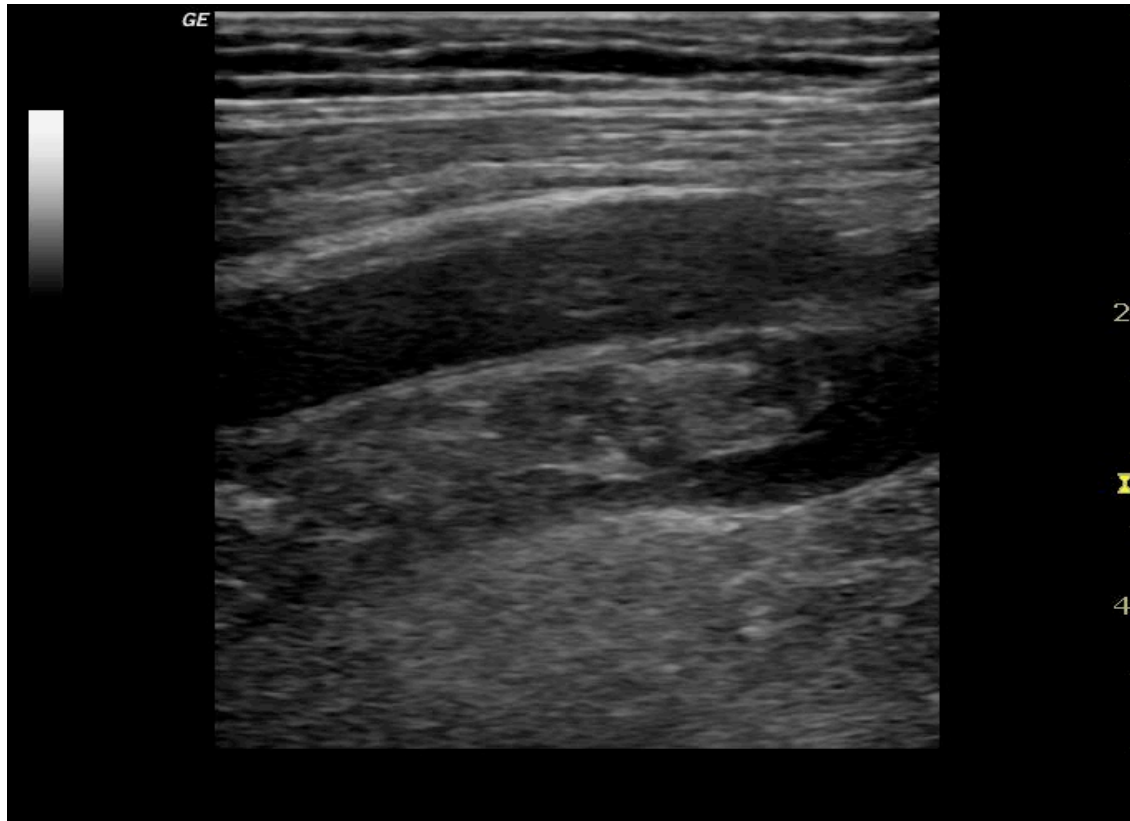
**Normal veins:**

- completely compressible
- no echogenic material within lumen

**DVT:**

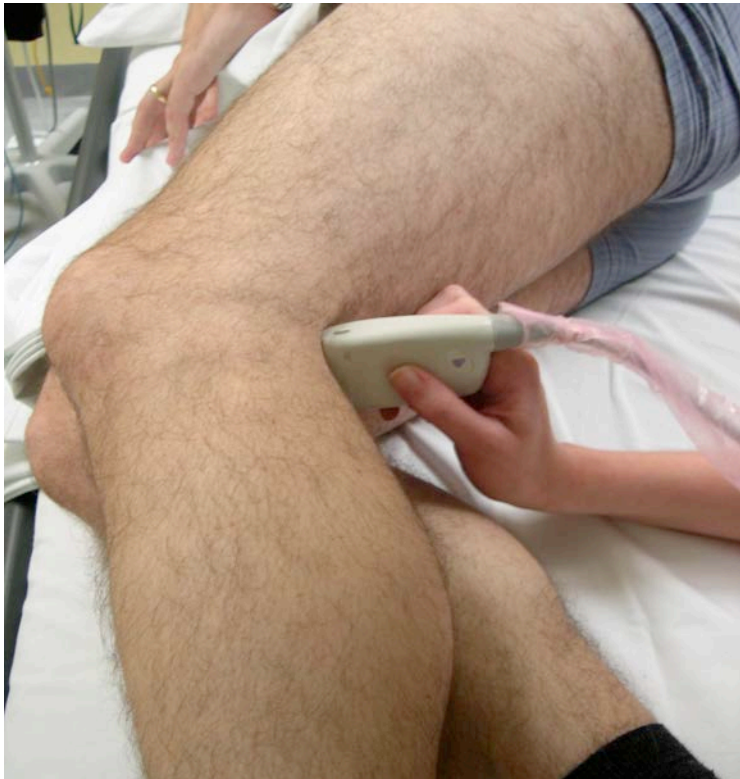
- cardinal sign = vein not completely compressible. This is enough for the diagnosis of DVT.
- if echogenic material is seen within the lumen, this confirms the diagnosis. However, this is not essential for diagnosis as DVT isn't always visible on US! (Because of gain settings and presets)
- if there is DVT more proximally, the vein will be compressible but distended. (This can be subtle though.)

**Echogenic material (DVT) in femoral vein, longitudinal scan. Artery is superficial to the vein.**





**Scanning the popliteal vein**



- *improve your image by asking the patient to:*
  - *Stand*
  - *Hum (= Valsalva manoeuvre)*
- *Don't use Doppler unless you've been trained in it. it can show 'no flow' in veins if the settings (esp. PRF) are wrong.*
- *Most importantly, this is a screening test only. If you really want to learn how to properly scan for DVT, attend a DVT course.*