


**AVID** Advances in Vascular Imaging and Diagnosis

## Volume Flow: Is this a wild goose chase?



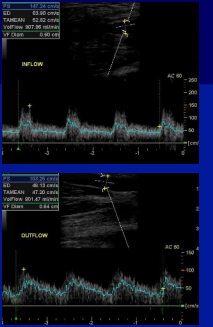
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- No Disclosures

### Duplex Ultrasound Volume Flow Measurements


**Volume Flow Measurement:**

- Inflow artery 2 cm proximal to anastomosis
- Outflow vein 8-10 cm from anastomosis\*\*
- Average 3-4 measurements at each site




### The calculation of volume flow

Average velocity x area = flow



### Can ultrasound accurately measure volume flow?

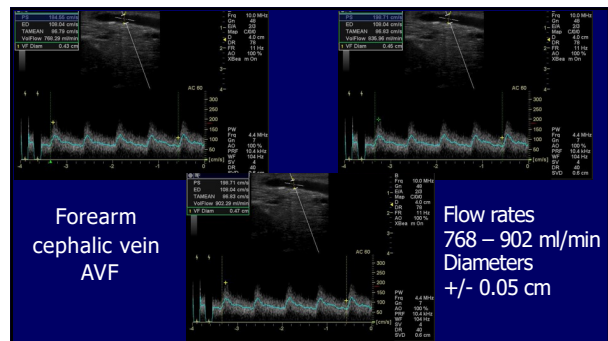
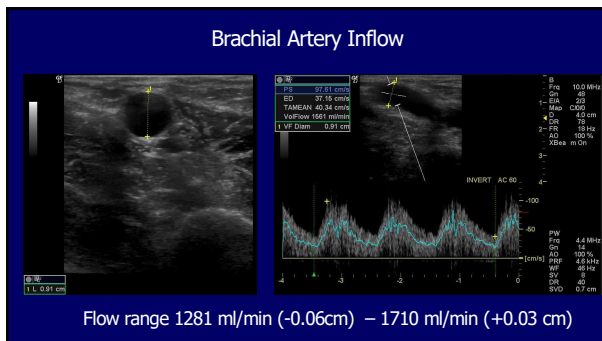
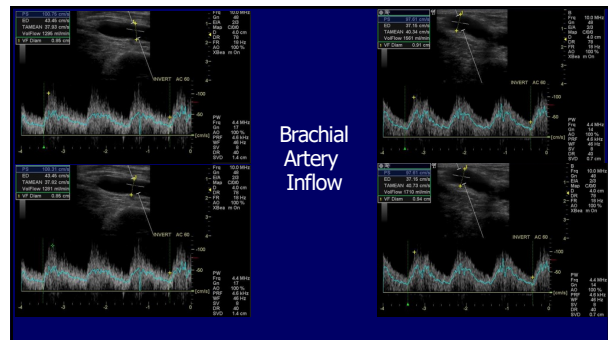
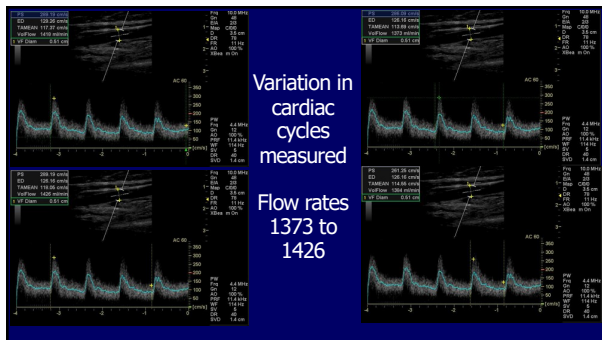
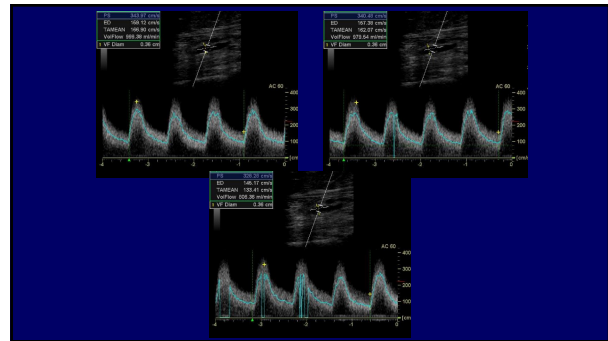
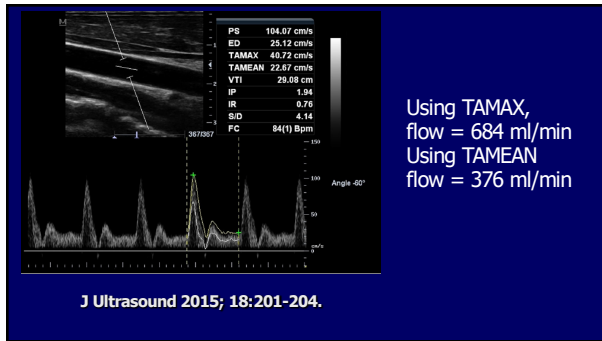
- Spectral waveform
  - Average velocity calc
  - Sample volume
  - Number of cardiac cycles
  - Laminar flow
- Diameter (circle)
- Patient variability

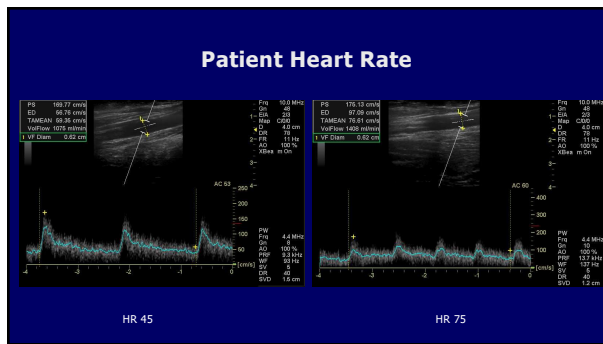


### The calculation of volume flow

Ultrasound systems can calculate average velocity by two methods:

- TAMAX: time average max uses the time integral of the highest velocities
- TAMEAN: time average mean uses the time integral of the mean velocities.





### Conclusion

- It is not a wild goose chase.
- It is hard to do accurately.
- Tips:
  - Check diameter measurement in transverse first
  - Use proper sample gate size and position
  - Obtain as clear a waveform as possible
  - Keep the patient calm and relaxed

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