Carpal Tunnel Ultrasound

**Basics**
- Use when concern for median nerve compression
- Symptoms of nerve compression include: decreased grip strength, numbness, and tingling in palm or fingers
- Nerves look like a bundle of hyperechoic spaghetti (in long axis) or a honeycomb (in short axis)

**Anatomy**
- Flexor retinaculum forms roof of the carpal tunnel
- Proximally: flexor retinaculum attaches from the pisiform to the scaphoid
- Distally: flexor retinaculum attaches from the hamate to the trapezium
- Proximal carpal tunnel:
  - Radial border- scaphoid
  - Ulnar border- pisiform
  - Floor- lunate
- Distal carpal tunnel:
  - Radial border- trapezium
  - Ulnar border- hamate
  - Floor- capitate
- Tunnel contents:
  - 4 deep flexor tendons
  - 4 superficial flexor tendons
  - Flexor pollicis longus tendon (on radial aspect)
  - Median nerve (superficial and more radial)
- Flexor pollicis longus tendon (on radial aspect) borders scaphoid and can be indentified by flexing the thumb
- Ulnar nerve and ulnar artery run together in Guyon's Canal (just superficial to carpal tunnel on ulnar aspect of wrist)

**Technique**

*Transverse Exam (Short Axis)*
- Probe marker towards radial aspect of wrist
- Proximal exam: place probe over scaphoid and pisiform (just distal to radius and ulna)

**Longitudinal Exam (Long Axis)**
- In long axis nerves and tendons look similar
- Flexing 2nd and 3rd digit slowly can help distinguish tendon from nerve
- Tendons will slide under the nerve
- Median nerve will be relatively still
- Median nerve has hyperechoic epinerium on deep and superficial surfaces
- In long axis: floor of tunnel is made of the radius, lunate, and capitate (from proximal to distal)

**Pathology**
- A median nerve > 4 mm indicates swelling
- In longitudinal view: bulging of median nerve prior to entering the carpal tunnel is abnormal
- In transverse view: observe for swelling in proximal carpal tunnel

**More Carpal Tunnel Ultrasound**
- If you want to check out a video on carpal tunnel here’s a link: [Carpal Tunnel Tutorial](https://www.sonomojo.org/carpal-tunnel-tutorial)