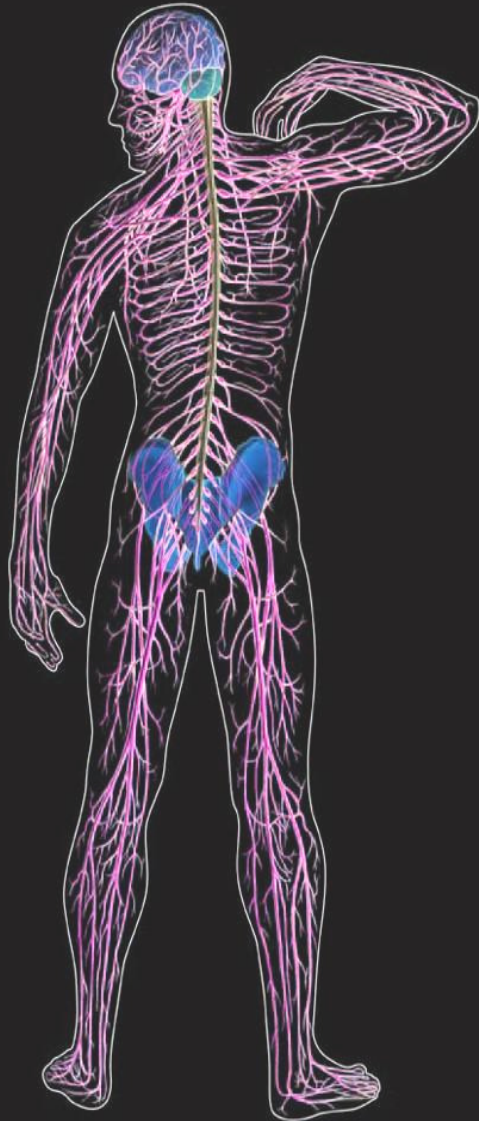


Introduction to Regional Anesthesia Part 1

Ultrasound Guided Nerve
Blocks for Dummies

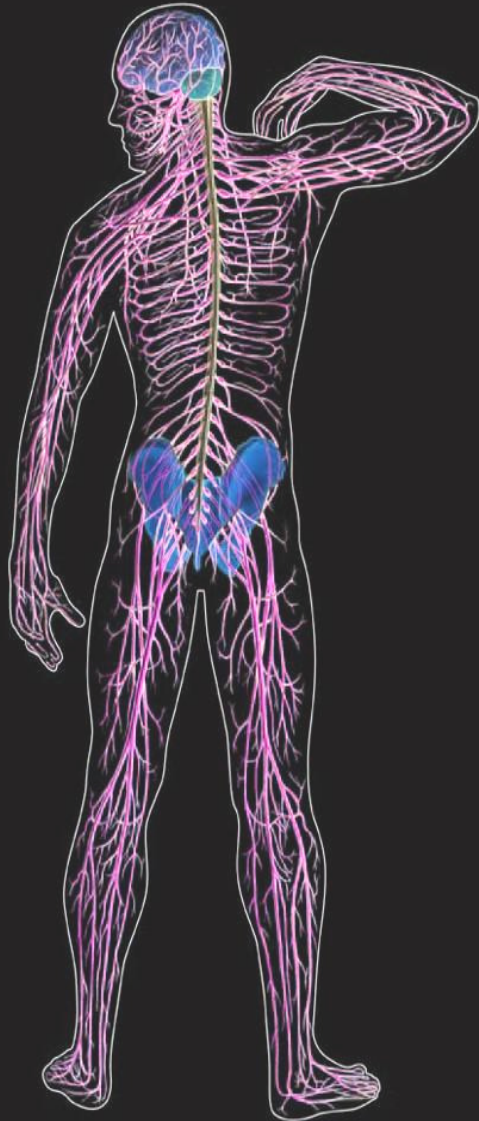
Todd A. Parker, MD
LCDR MC USN

Why Nerve Blocks?



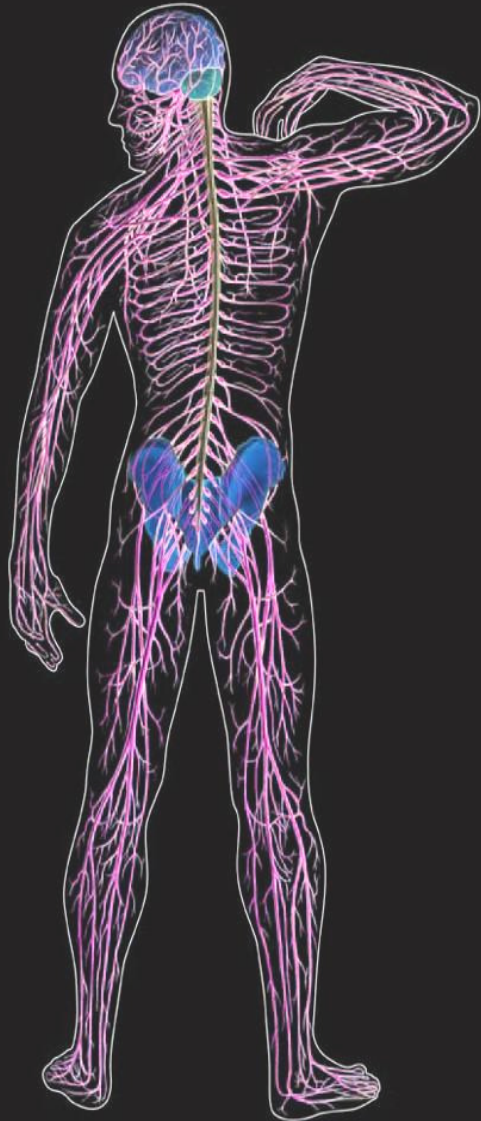
- Compared to Procedural Sedation:
 - Fewer adverse effects
 - Minimal monitoring
 - Less staffing
 - Provides prolonged post-procedure analgesia
 - Reduced post-procedure narcotic use
 - Most peripheral blocks easy to learn
- Far more effective than ortho sedation
 - “SHHHHHH. Almost done!”

Indications



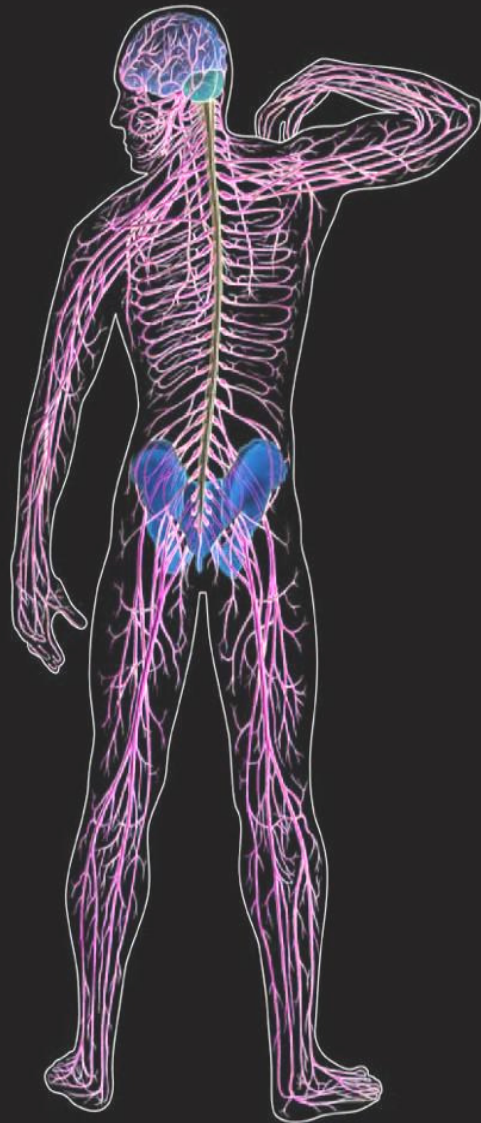
- Procedures:
 - Fracture reduction
 - Complex suturing
 - Fracture Reduction
 - Dislocation Reduction
- Burns
- Amputations

Contraindications

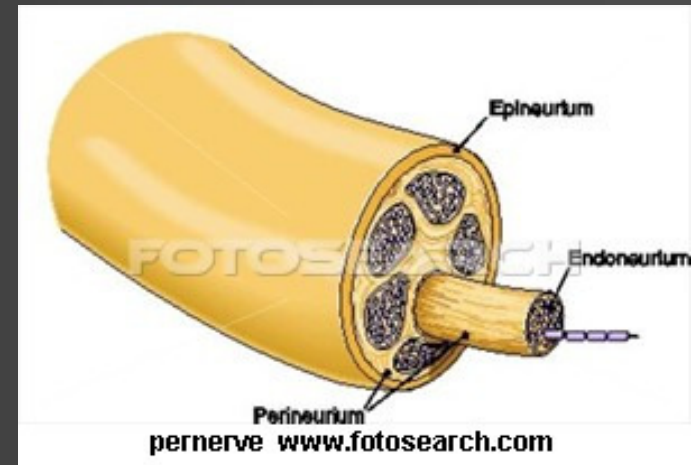


- Patient refusal
- Allergy to local
- Coagulopathy
 - (Esp. femoral or brachial plexus)
- Any concern over compartment syndrome
- Infection at injection site

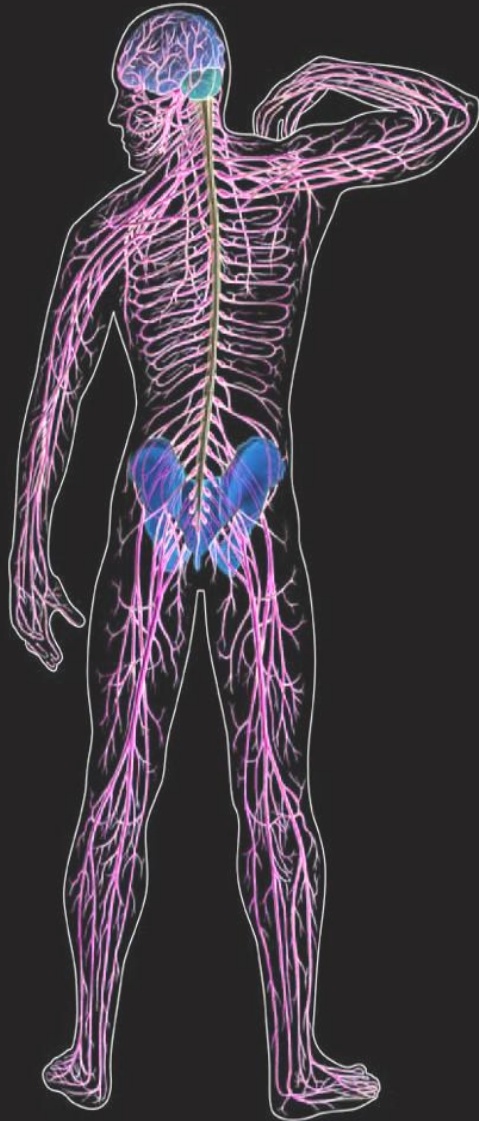
Nerve anatomy



- Epineurium – outer sheath
- Perineurium – bright white
- Nerves – high water content
 - Honeycomb appearance

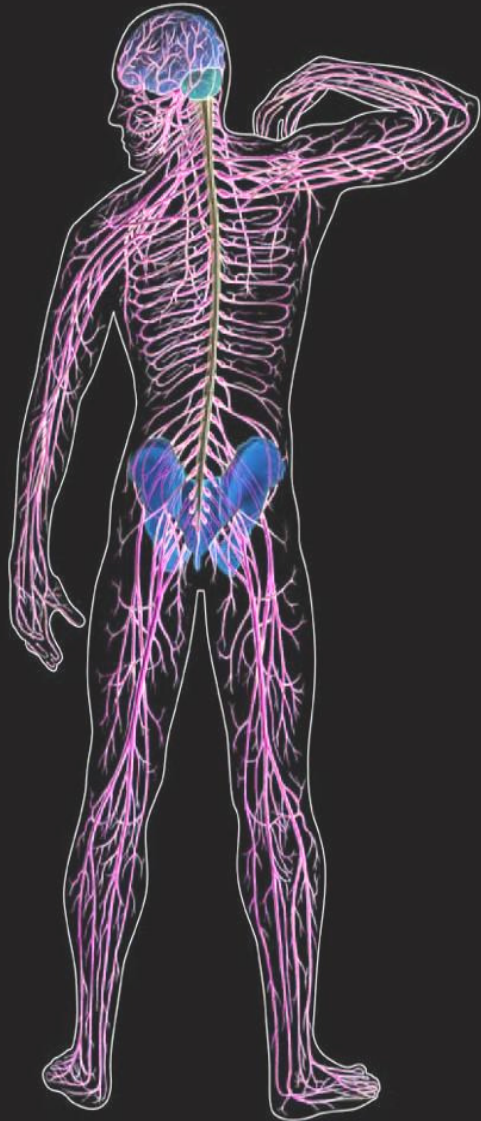


Localization



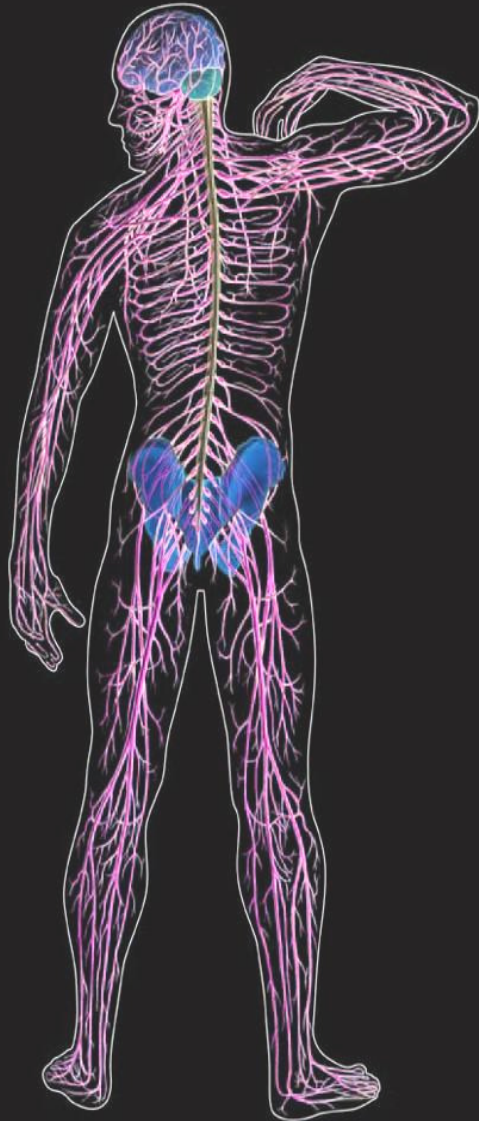
- High Frequency Probe
- Nerve in cross section
- Know the anatomy
- In plane approach
 - Can watch needle entire way
- Two person procedure
 - Probe and needle
 - Syringe
- Semi-sterile procedure
 - Tegaderm / Skin Prep / Gloves

Needle selection



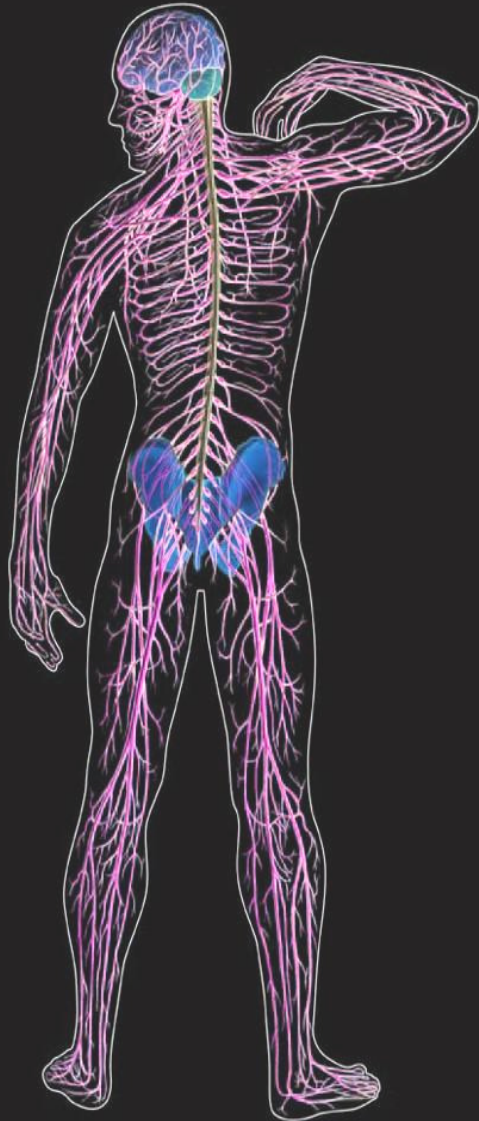
- Prefer spinal or block needle
- Tubing connects to syringe
- Needle size
 - 25-27 gauge adequate for peripheral
 - 22 gauge for proximal

Injection



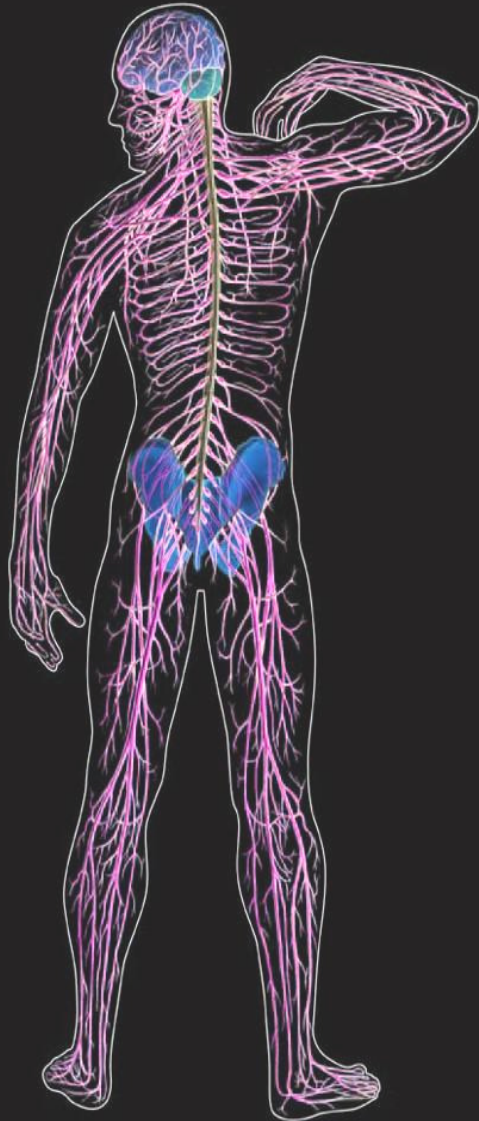
- Smaller/distal nerves
 - Inject around epineurium
 - Adequate diffusion
- Proximal nerves (ie Femoral/BP)
 - Penetrate epineurium
- **ASPIRATE!**
- Inject adequate volume
- Inject a little adjacent to nerve
 - Gives tip room to move
 - Inject below and above
- Goal is to surround nerve
 - Same fascial plane
 - Circumferential spread

Anesthetic choice



- Short term procedures
 - Lidocaine usually adequate
 - Use higher concentrations (2%)
 - No epi!
- Longer procedures/post-procedure analgesia
 - Marcaine
 - No epi
 - Intraneural injections – Inc complications
- Don't be shy (as long as aspirated!)

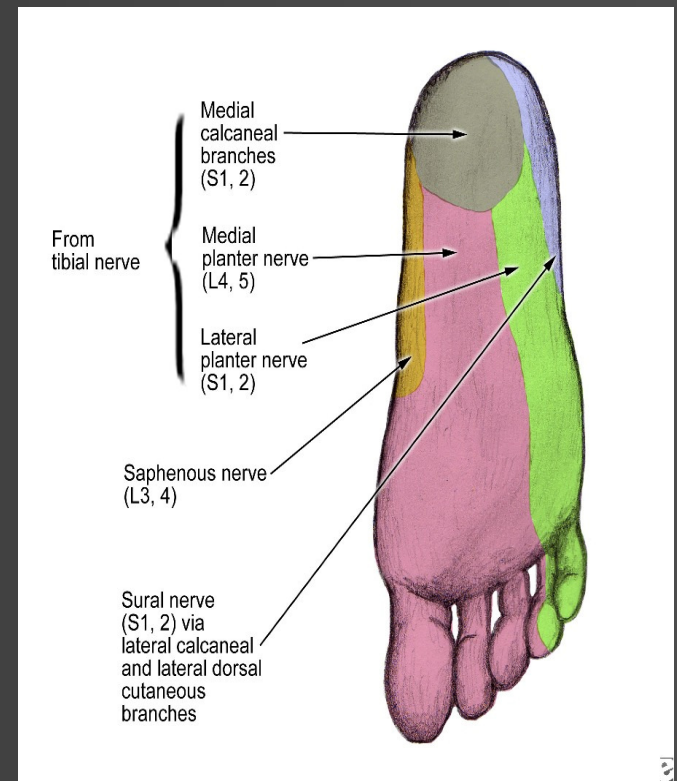
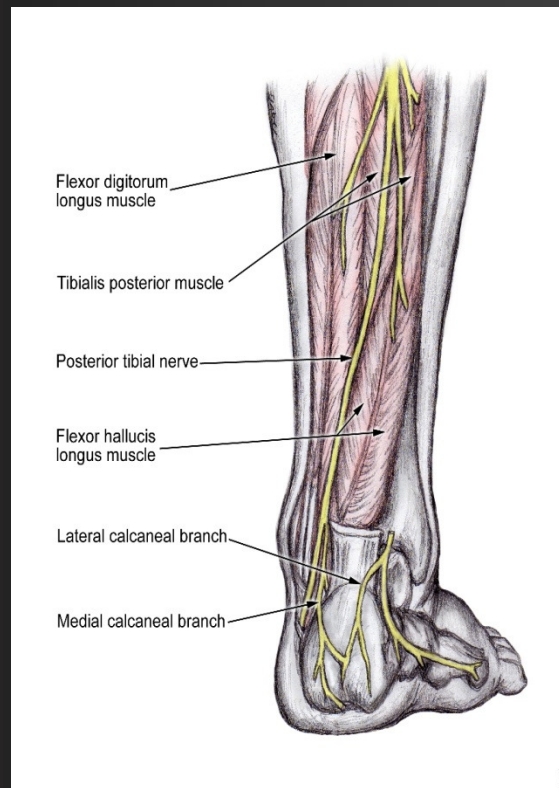
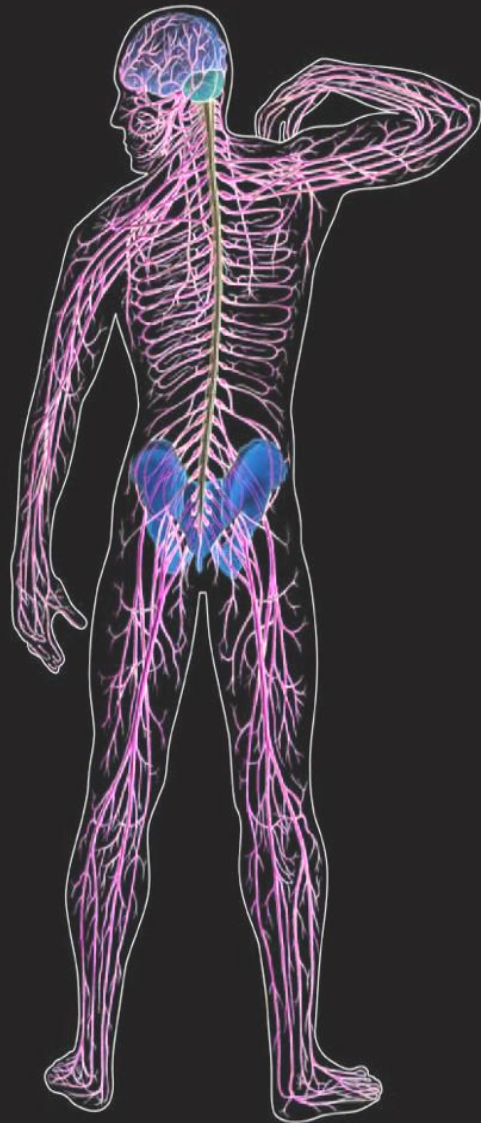
“Basic Blocks” (today)



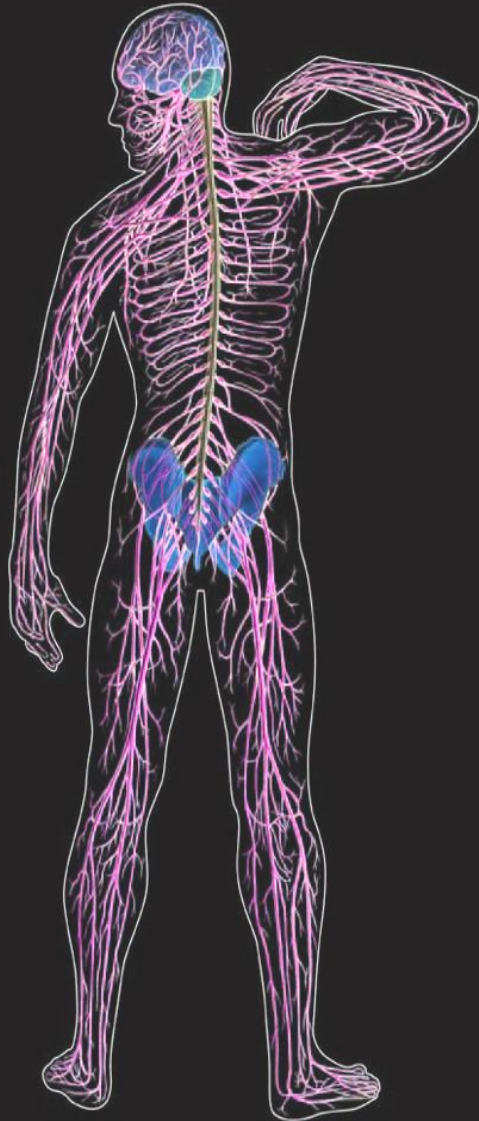
- Posterior Tibial
- Popliteal (Sciatic)
- Forearm/Hand (Ulnar/Median/Radial)
- Next time:
 - Femoral
 - Brachial Plexus (Interscalene and Supraclavicular)

Posterior Tibial

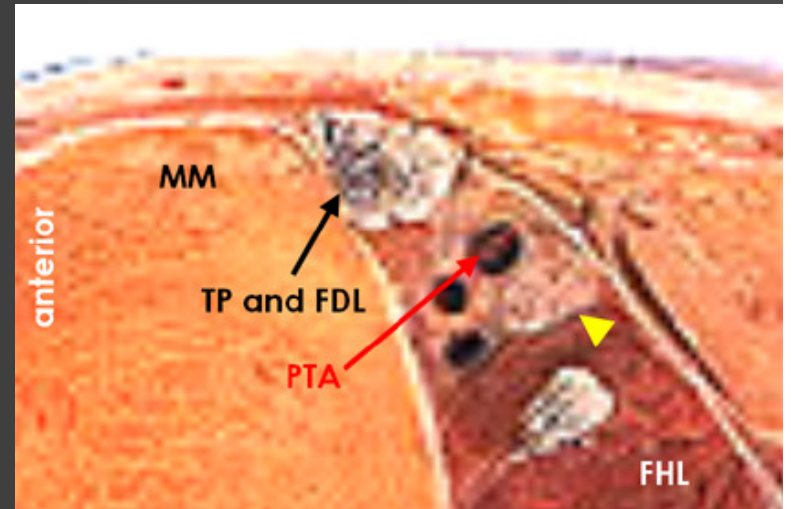
- Blocks 95% of plantar foot



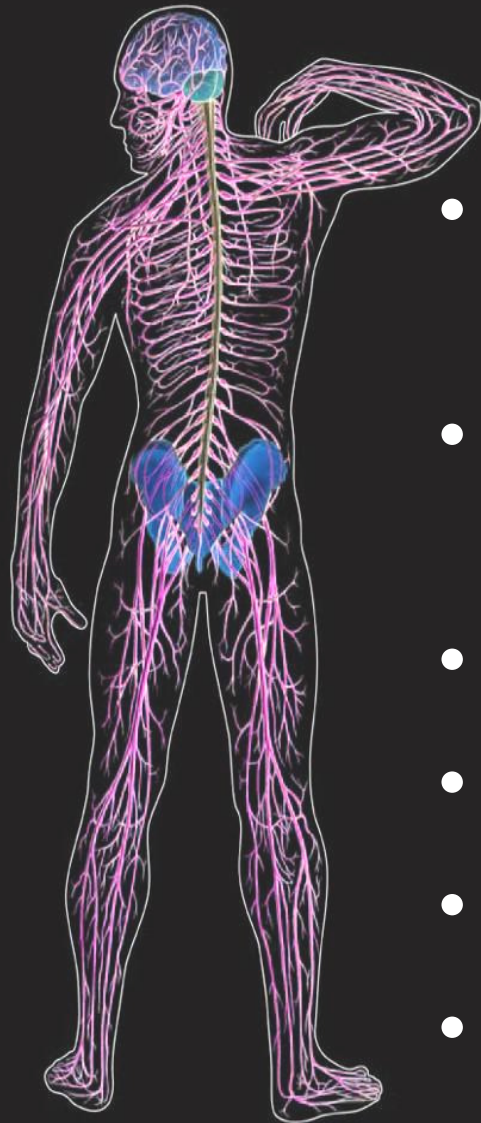
Posterior Tibial



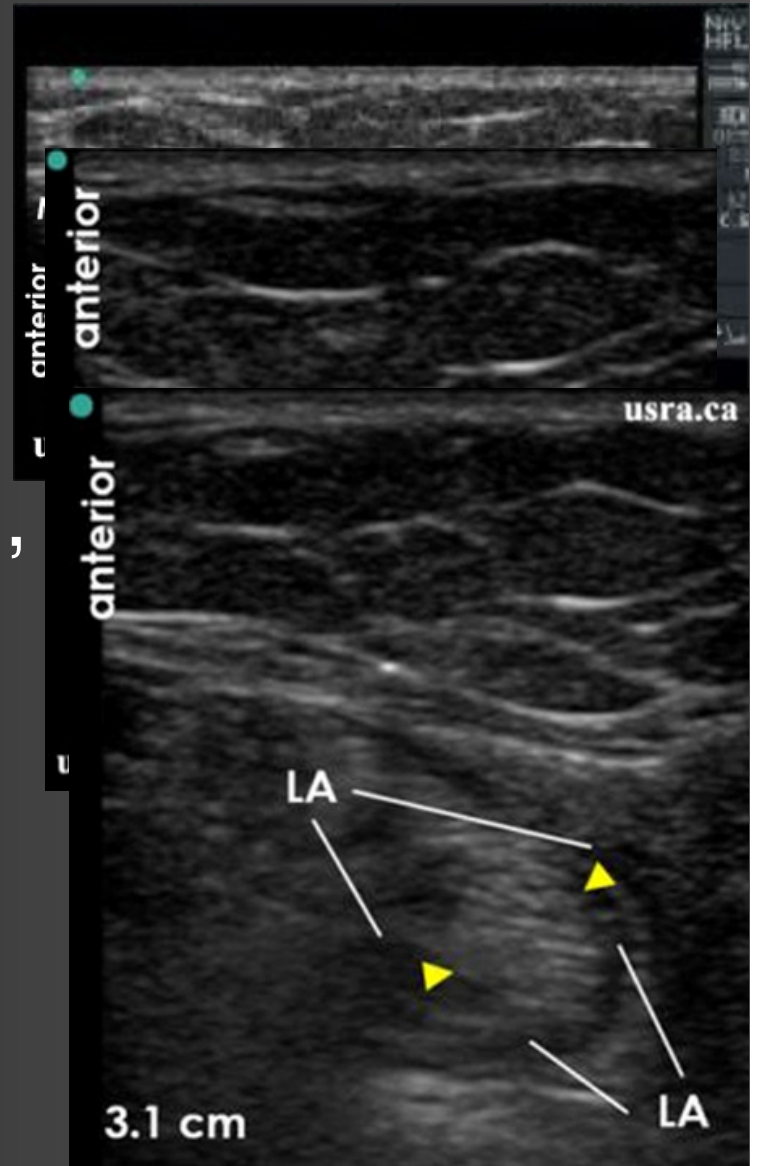
- Anatomy:
 - Find medial malleolus
 - Find posterior tibial artery
 - Nerve is adjacent/posterior
 - Follow proximally 2 cm
 - Note tendons
(Have pt wiggle toes)



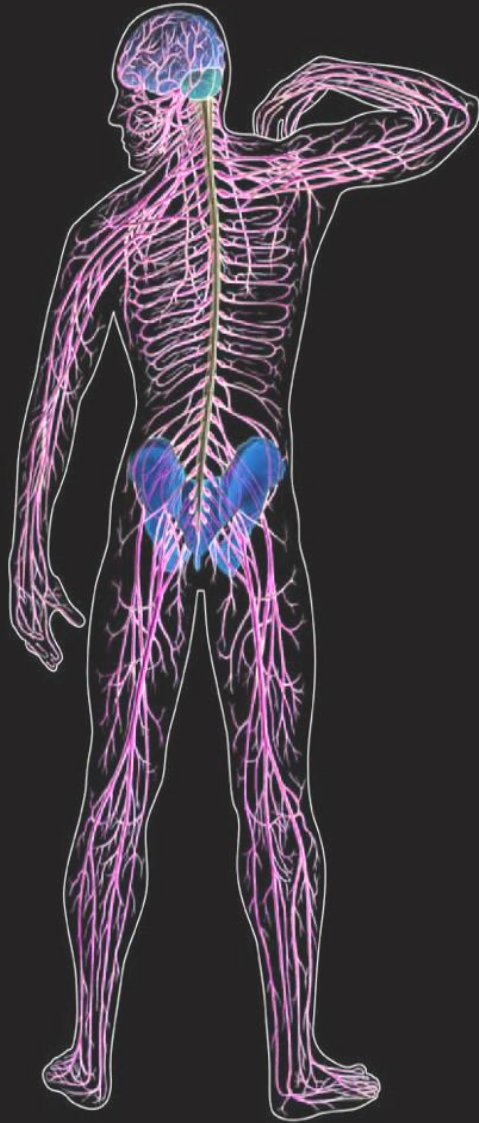
Posterior Tibial



- Patient supine or lateral decub
- Find medial malleolus, vessel, nerve
- Follow nerve
- Insert needle
- **ASPIRATE!**
- Inject

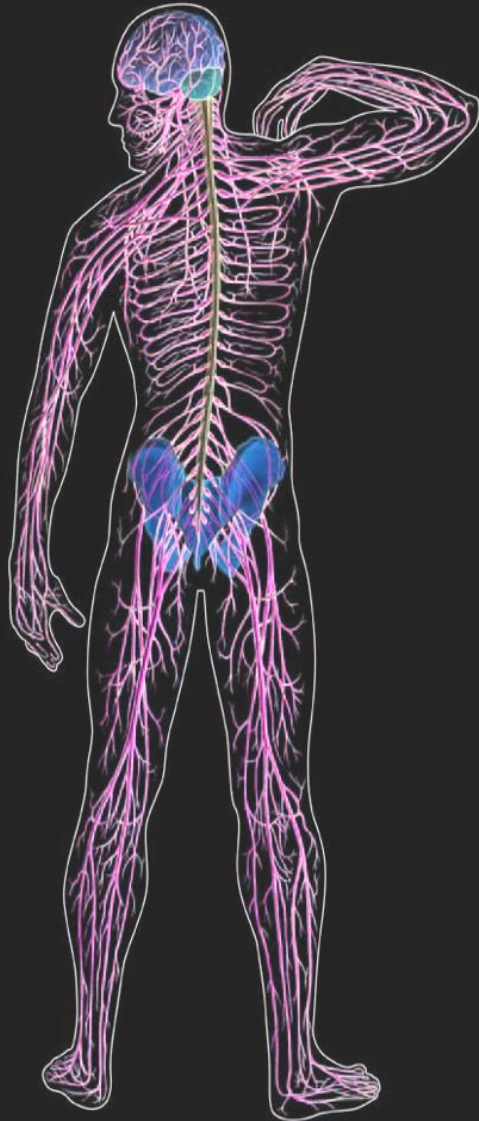


Posterior Tibial Video



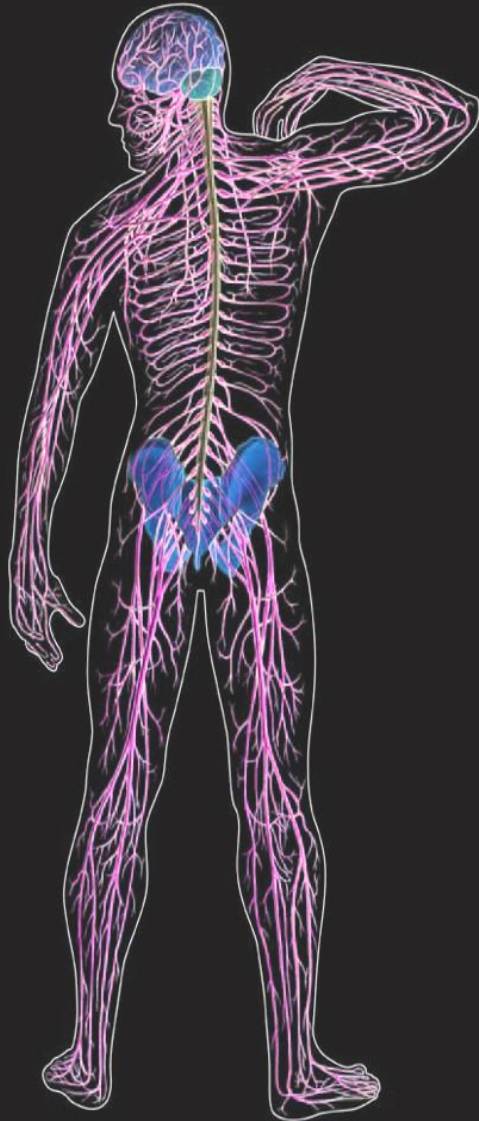
[Lateral Decubitus Position
Ankle Block \(In Plane
Approach\) | Ultrasound for
Regional Anesthesia](#)

Sciatic (Popliteal) Nerve Block

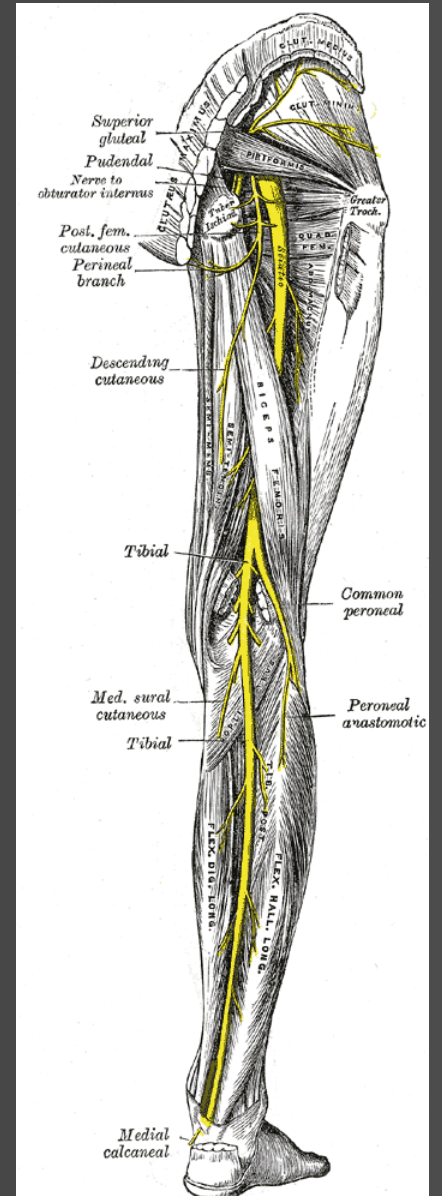


- Indications:
 - Anesthesia of:
 - Distal Tibia
 - Distal Fibula
 - Ankle and Foot
 - Careful if compartment syndrome!

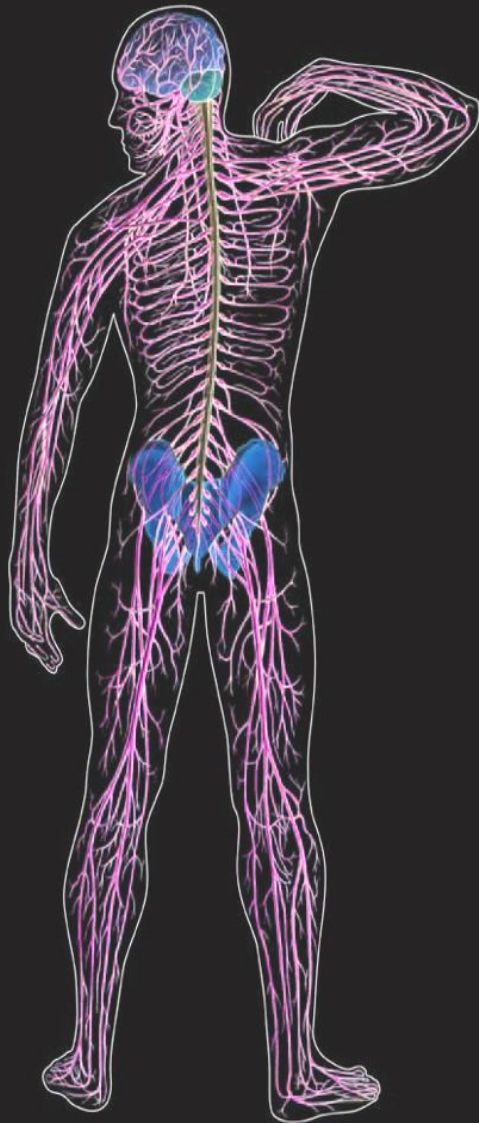
Sciatic (Popliteal) Nerve Block



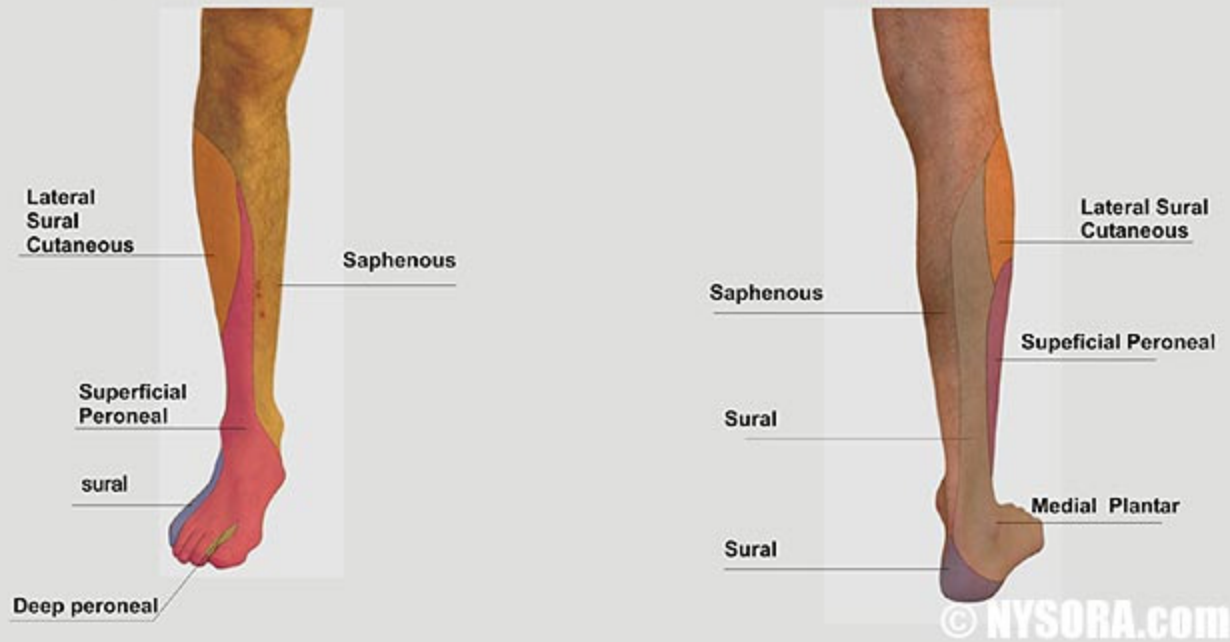
- Performed superior popliteal fossa
- Above bifurcation of Common Peroneal and Tibial Nerve



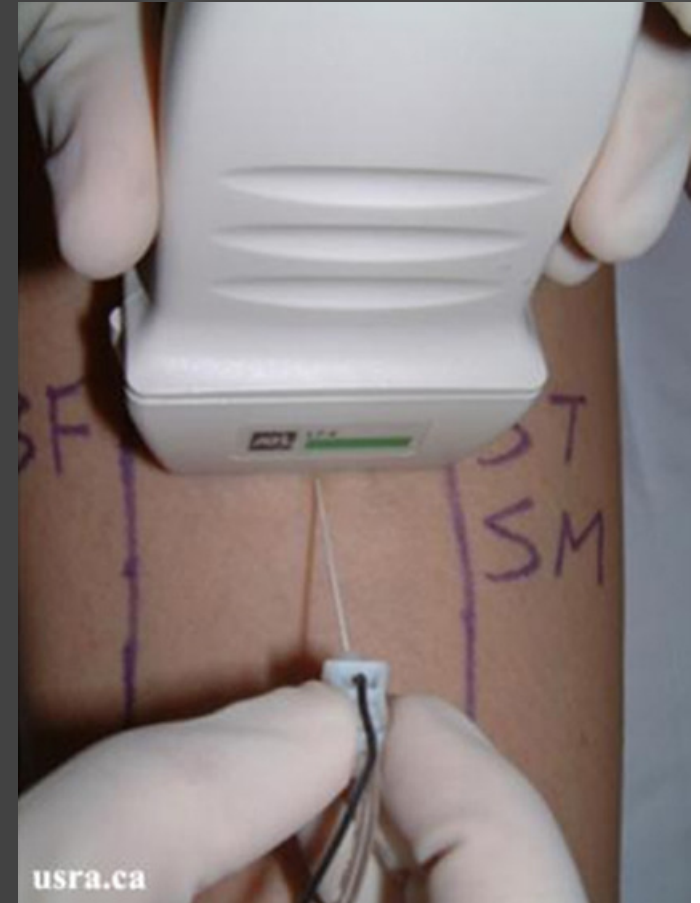
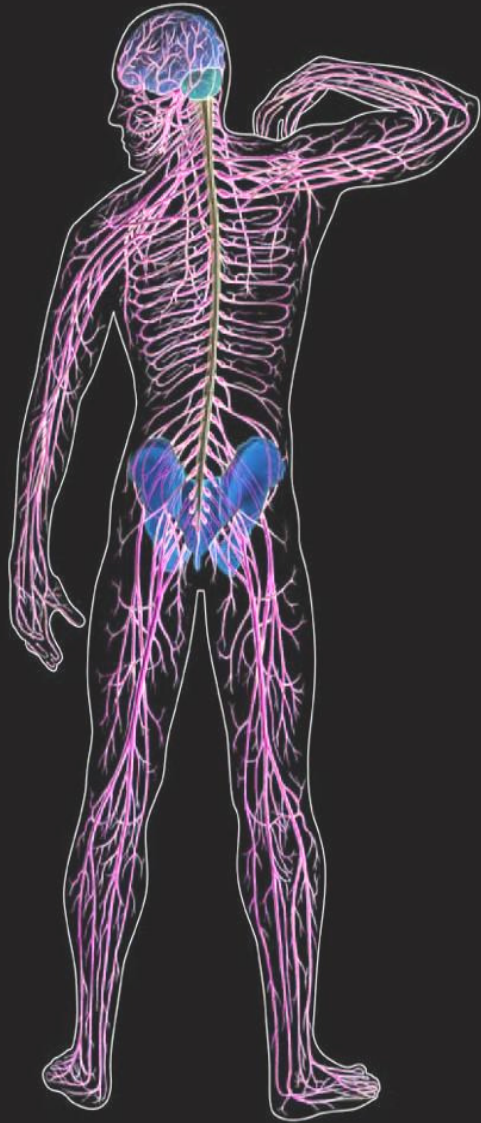
Popliteal Block



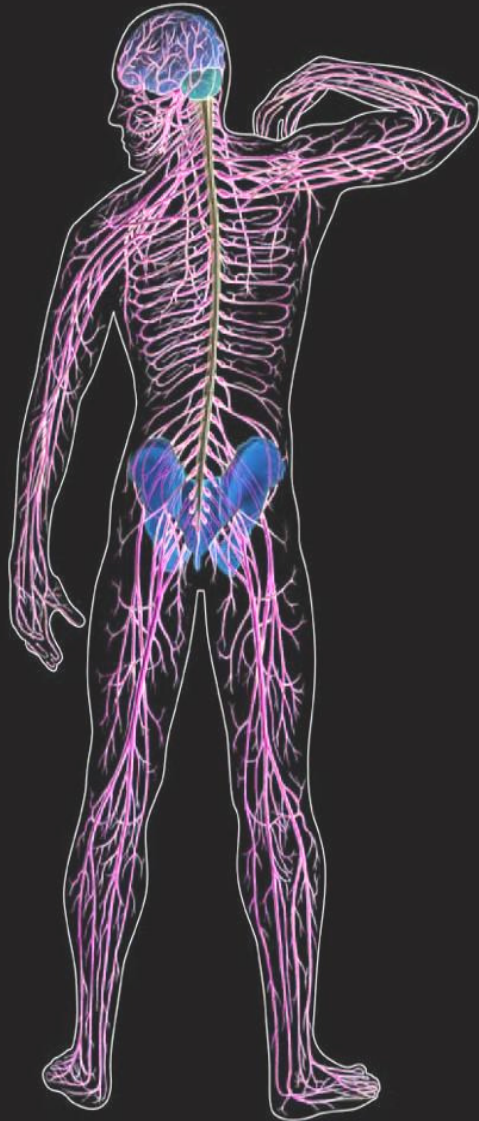
Popliteal Block: Distribution of Anesthesia



Anatomy

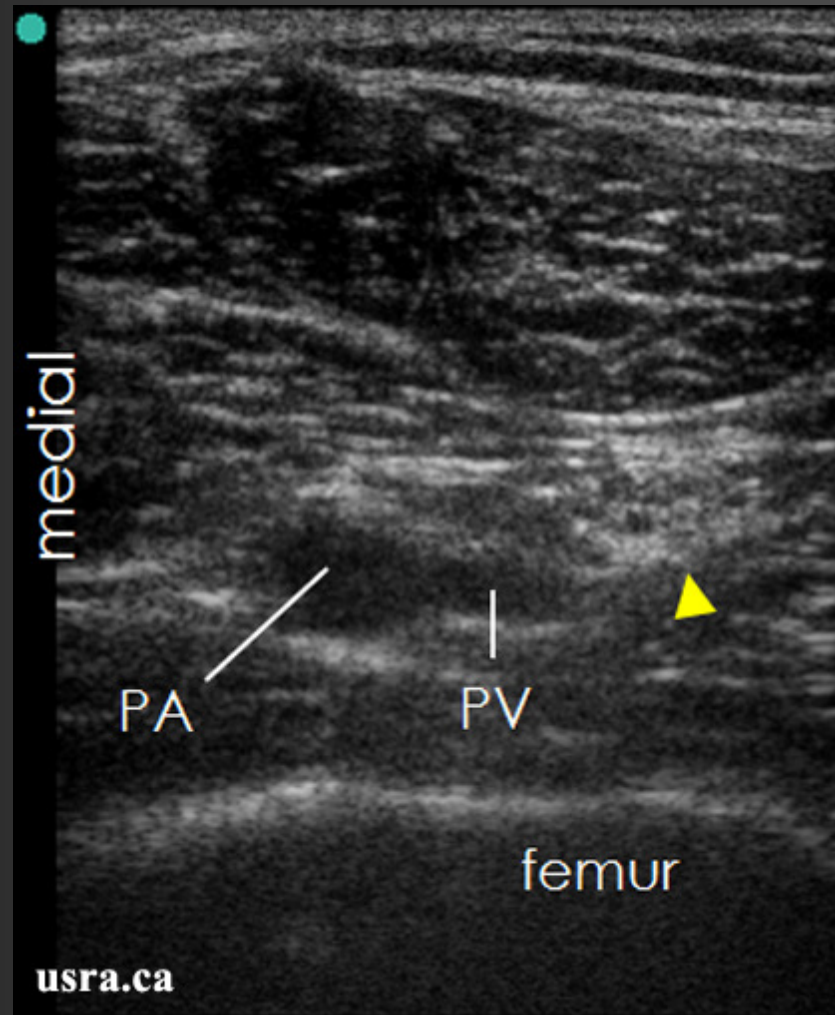
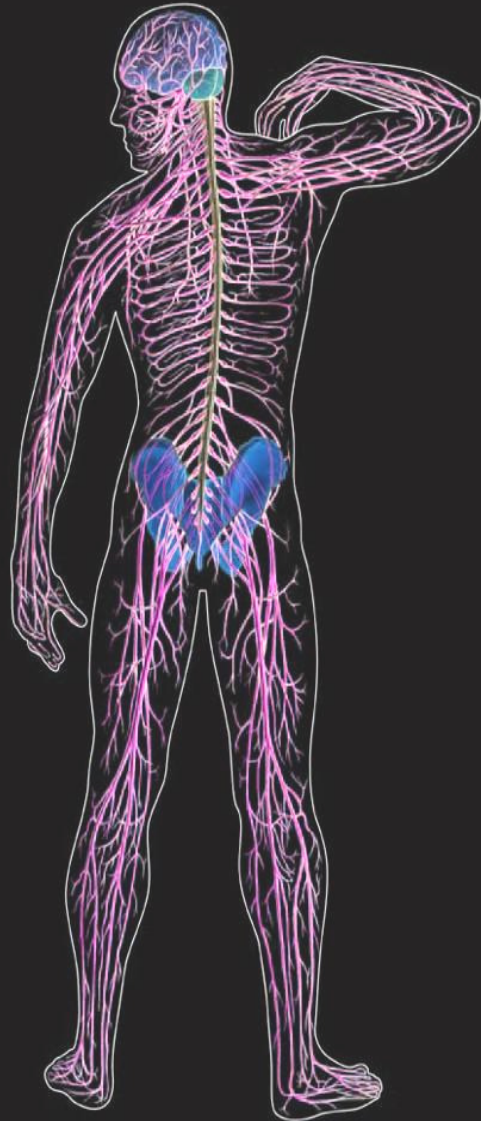


Nerve location

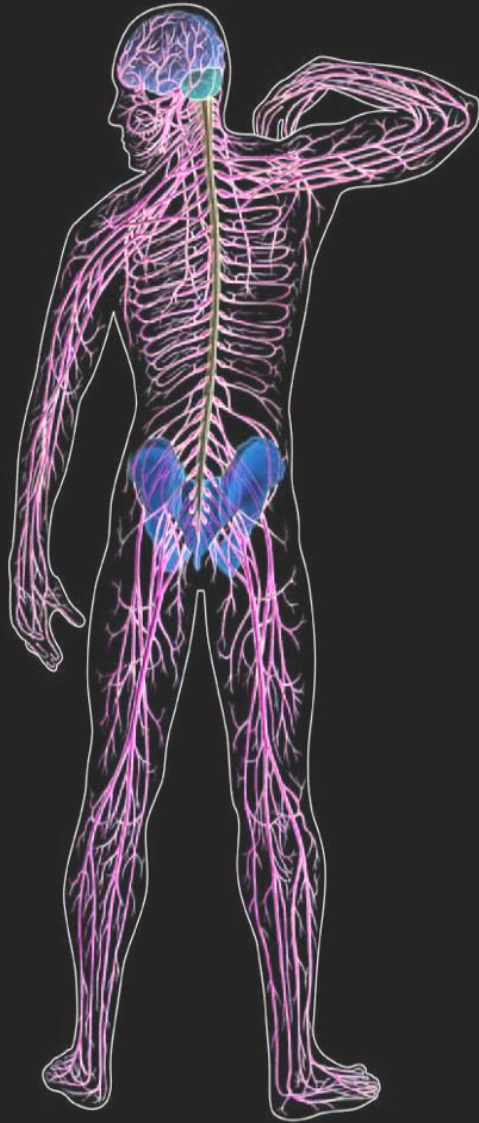


- Select the appropriate depth: 2-5 cm
- Identify Femur
- Identify pulsatile popliteal artery (go distal if need to)
- Transverse view of sciatic nerve (higher than think)
 - Commonly hyperechoic in this region
 - Lateral to the popliteal artery
 - Angle transducer caudally to enhance nerve
- Scan proximal / distal
 - Find split into peroneal / tibial
- Aim to block before division

Sciatic Pictures/Anatomy

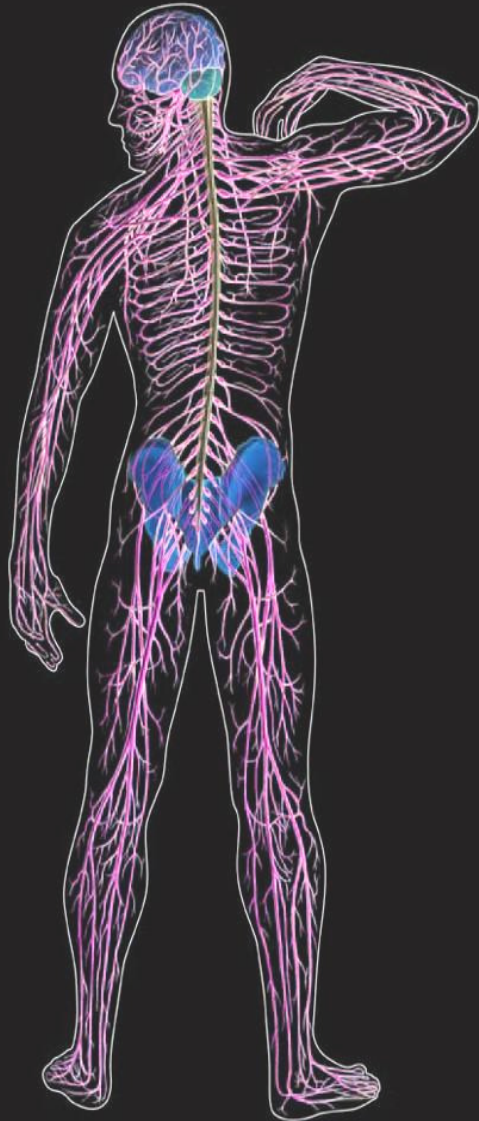


Sciatic nerve split



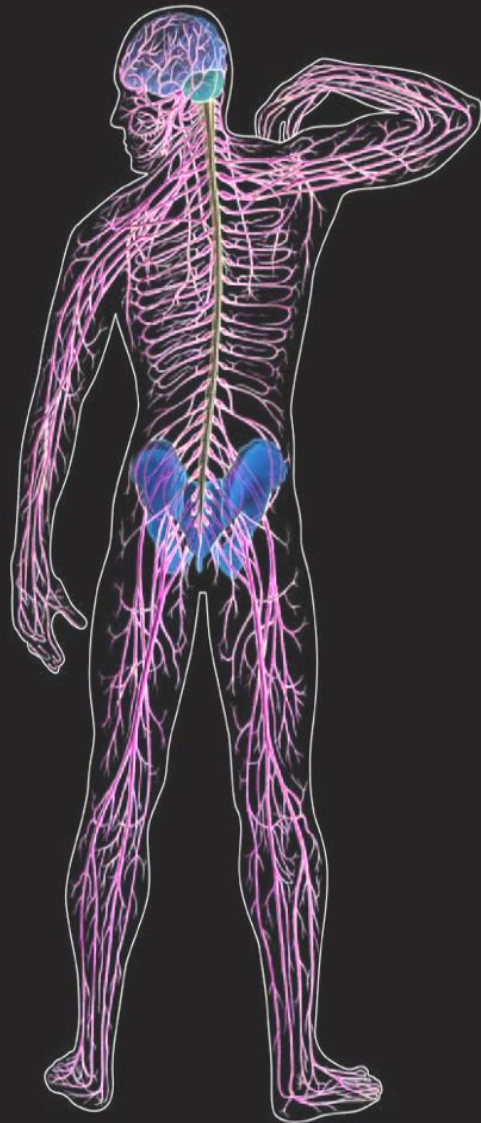
http://www.usra.ca/pop4_vid

Popliteal Sciatic Block

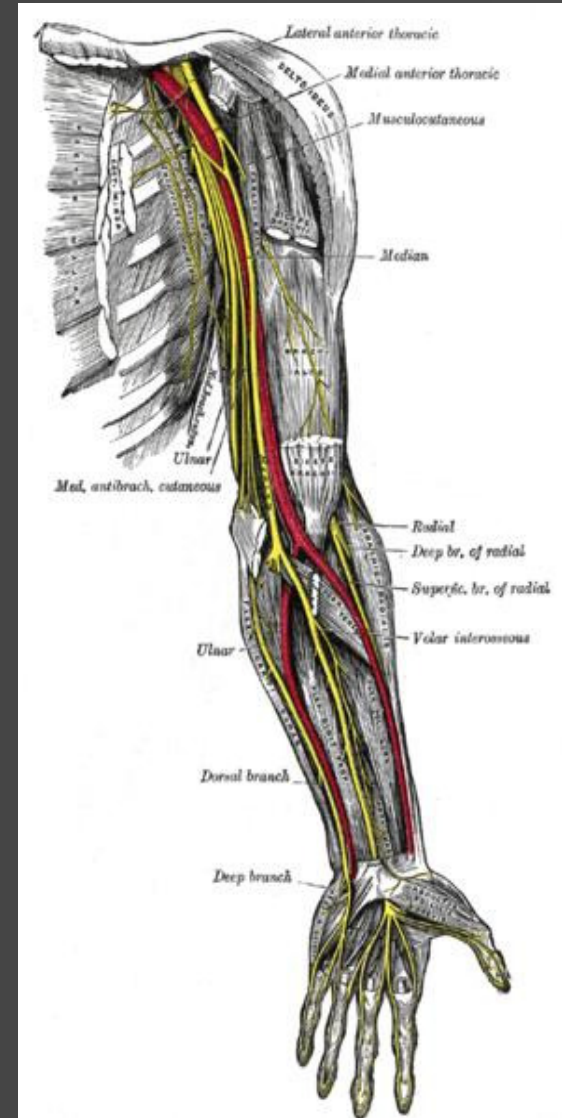


- Sonicnerveblock.com - Ultrasound Guided Regional Anesthesia and Ultrasound Guided Peripheral Nerve Blocks

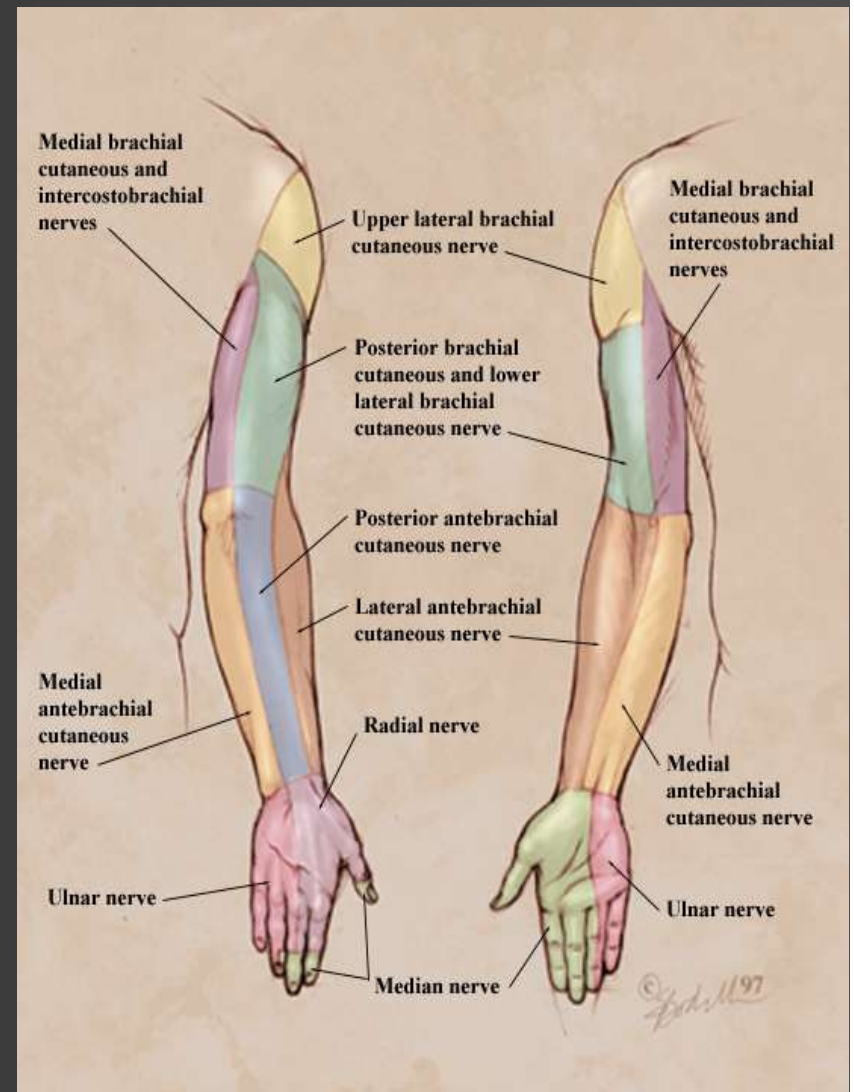
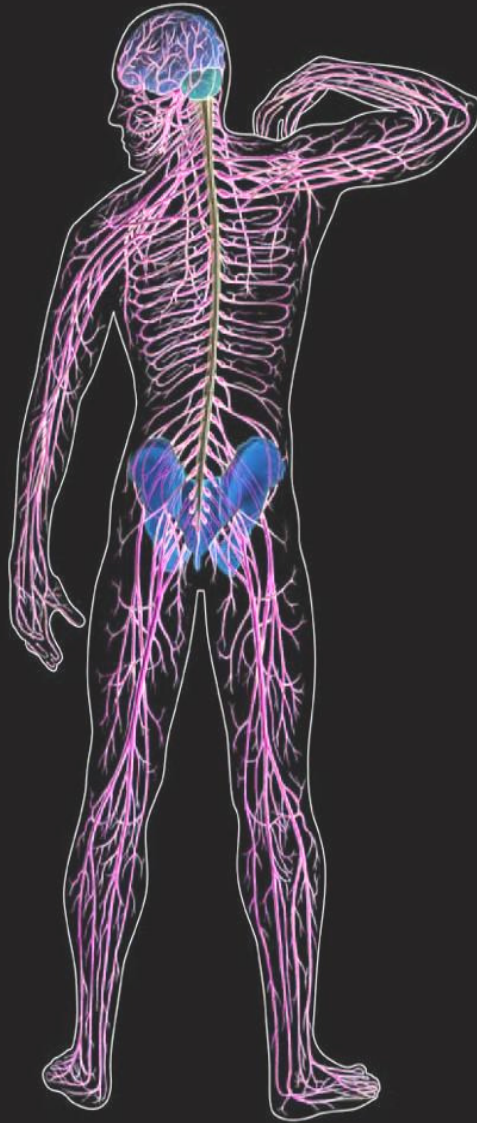
Forearm Block



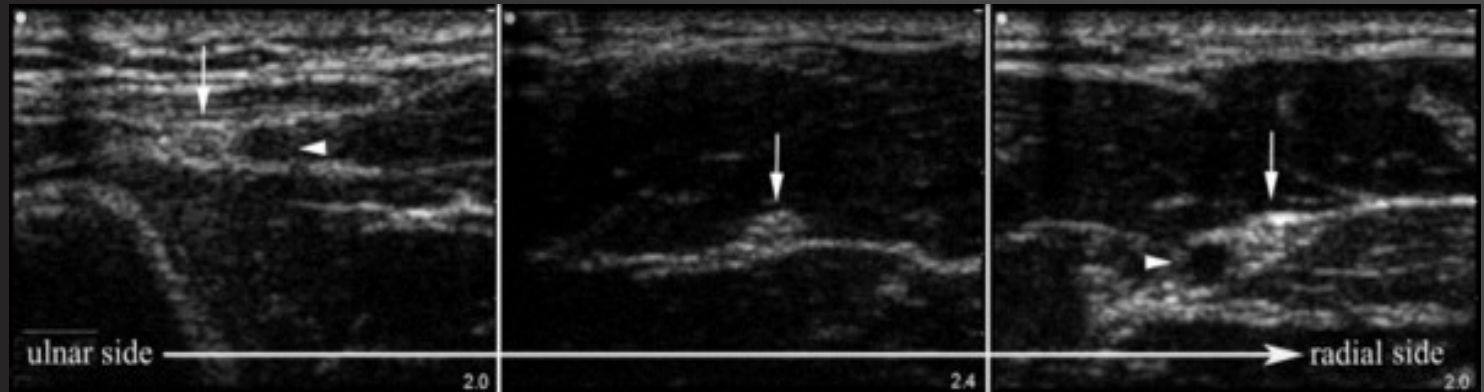
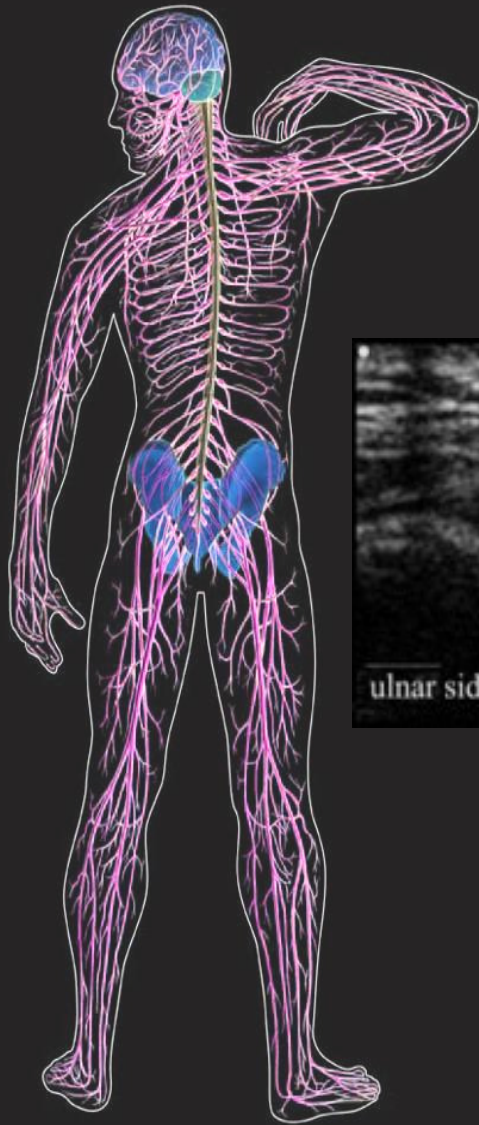
- 3 nerves
 - Ulnar
 - Median
 - Radial
- Excellent for hand/wrist anesthesia
- Good at distal forearm anesthesia
 - Incomplete block - add hematoma block



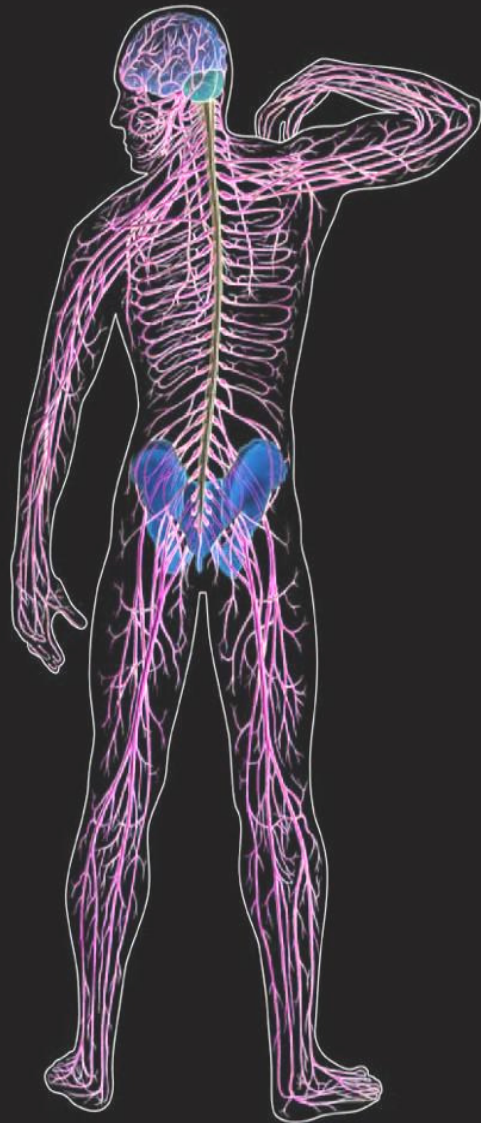
Forearm Block



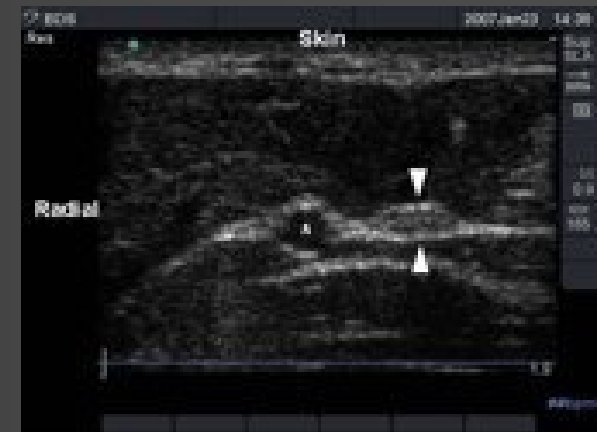
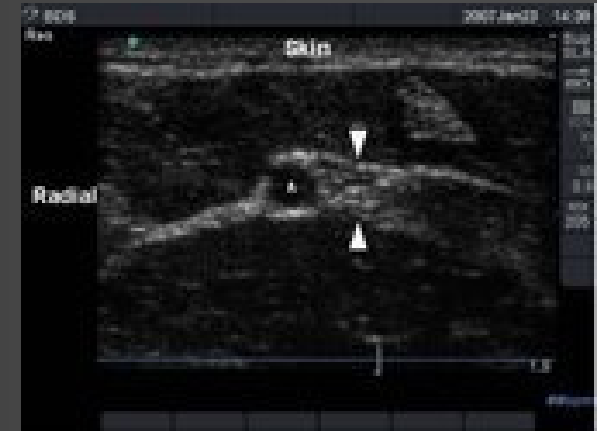
Forearm Block



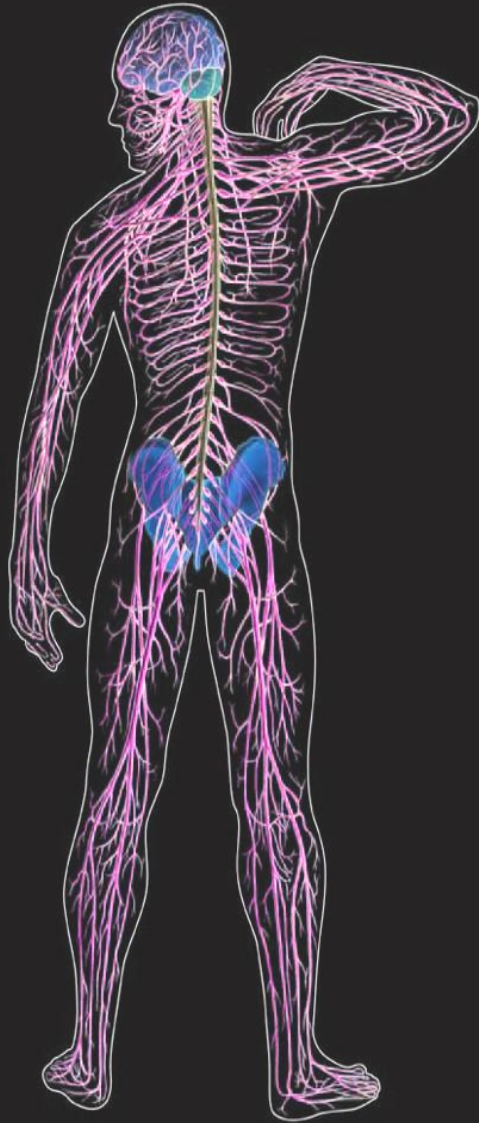
Ulnar Nerve



- Start distally at wrist
- Identify ulnar n. and a. (n. medial to a.)
- Follow ulnar n. proximal until splits
- Higher better



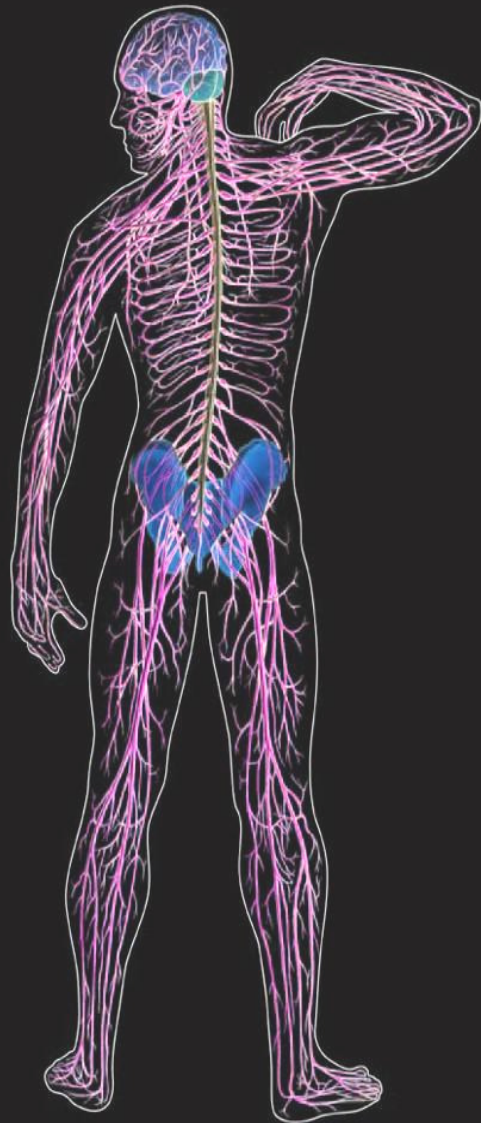
Ulnar nerve



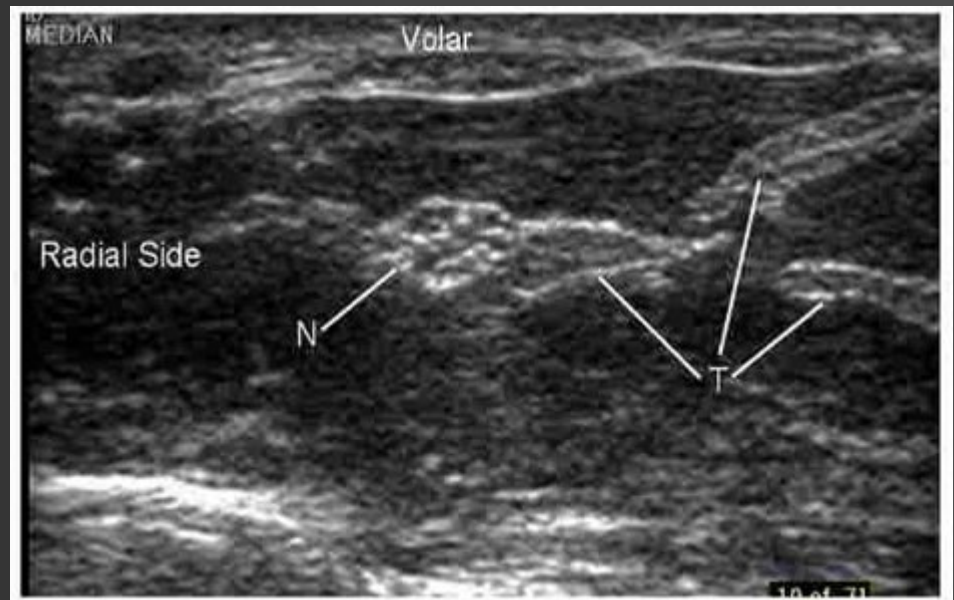
- Following ulnar nerve distal to proximal

http://www.usra.ca/ulnar_vid

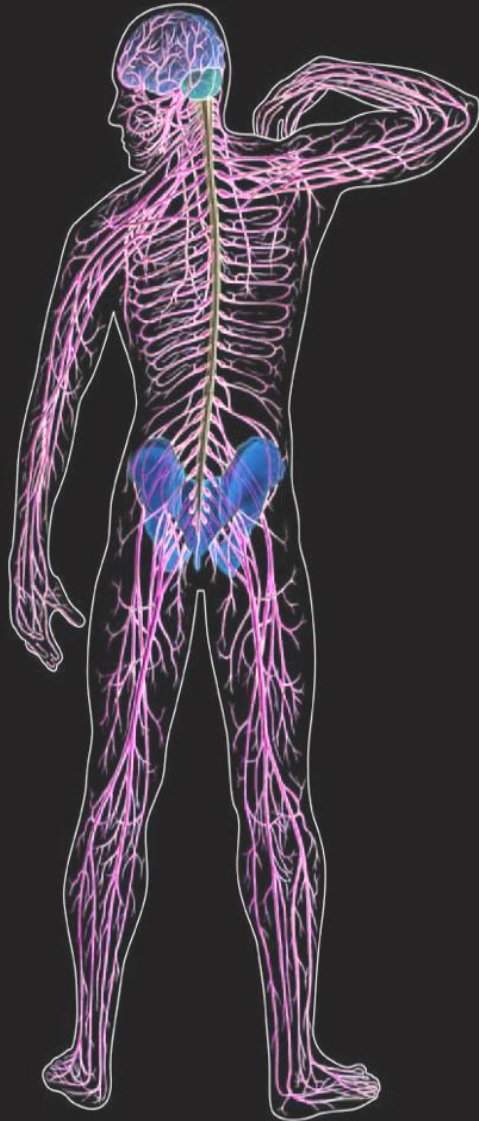
Median Nerve



- Start at wrist or
- Move radially from ulnar n.
- No associated artery
- Same fascial plane

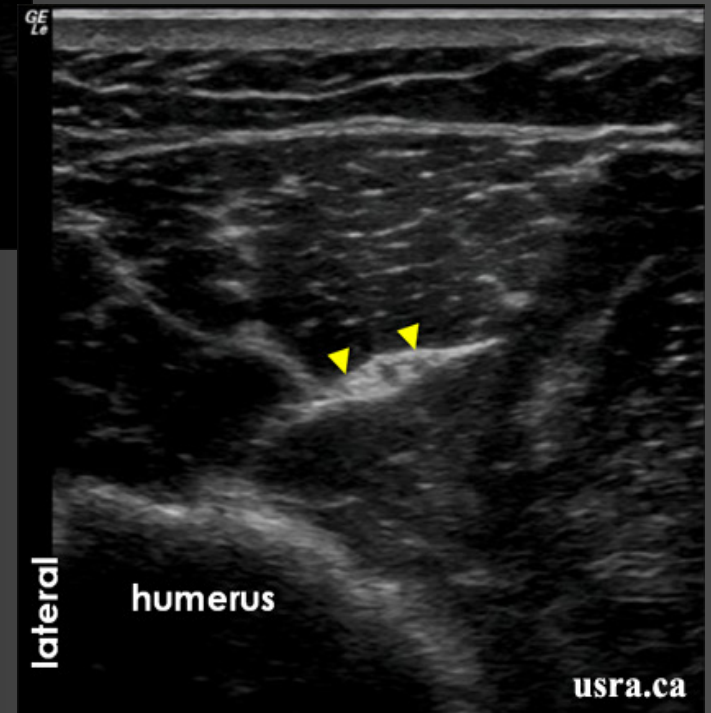
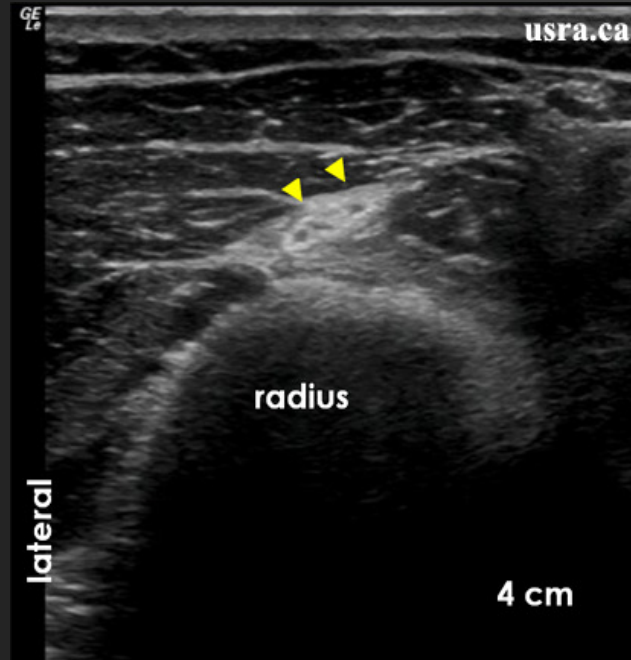
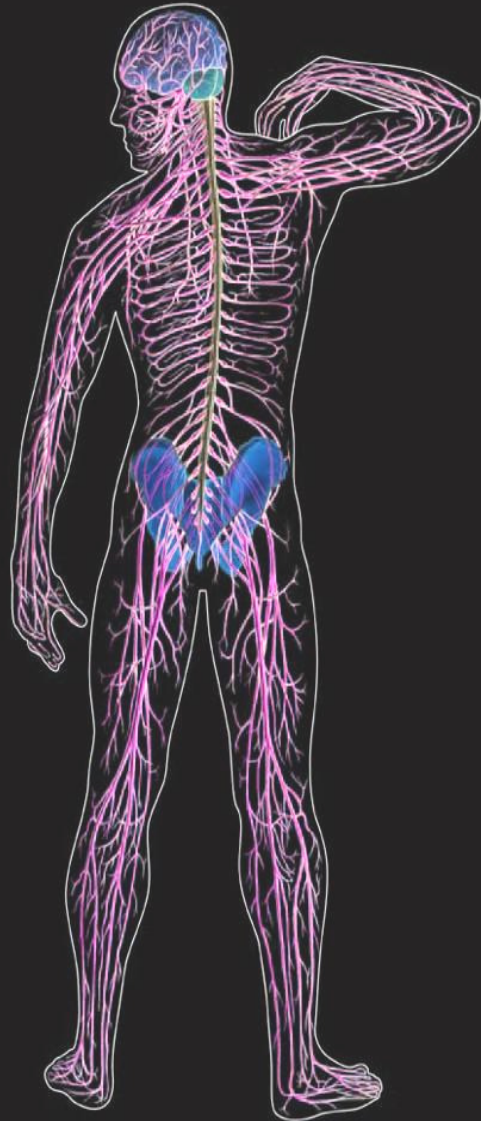


Radial Nerve

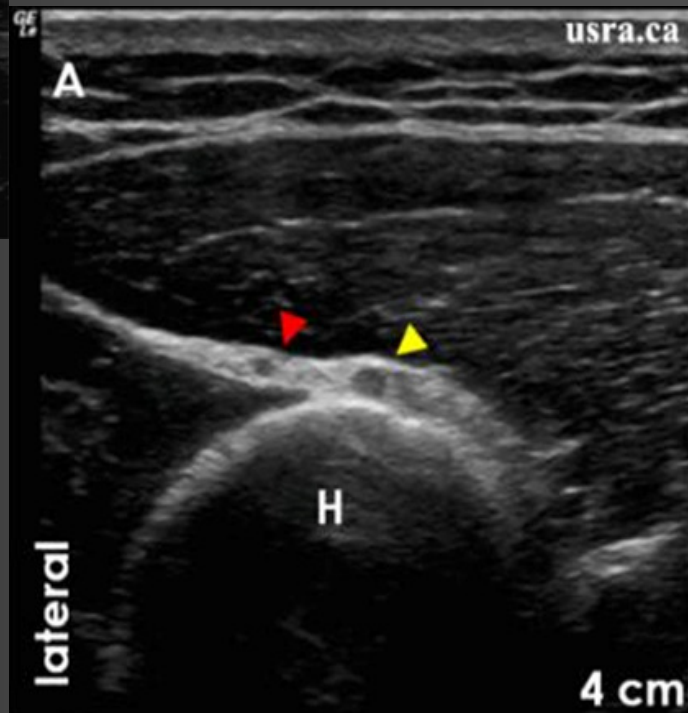
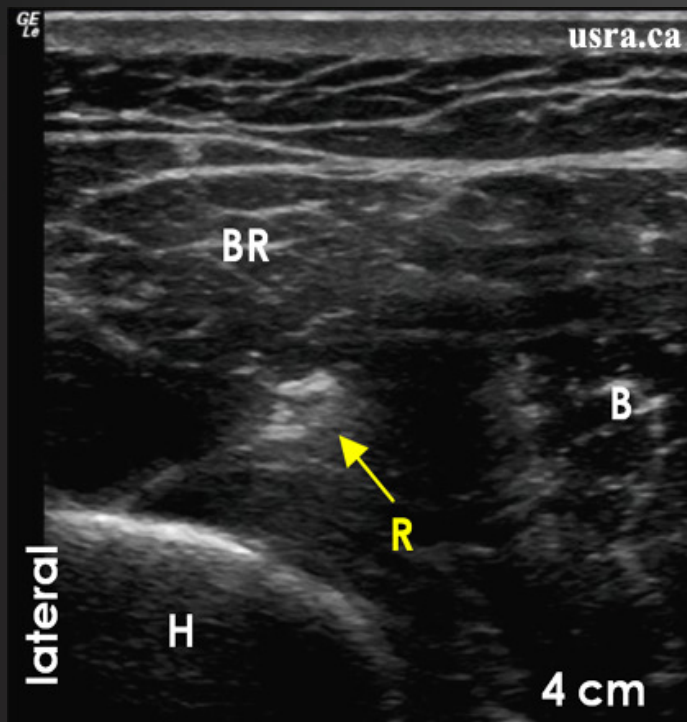
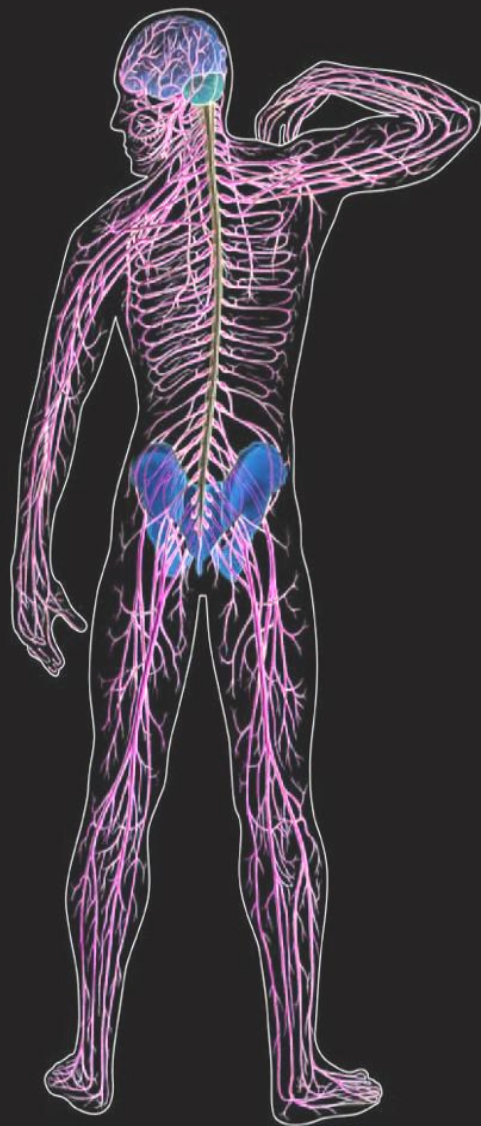


- If just getting hand
 - Start at wrist
 - Identify radial artery
 - Follow proximally
 - Nerve lateral to a.
- If getting wrist
 - Above elbow
 - Find nerve as exit groove

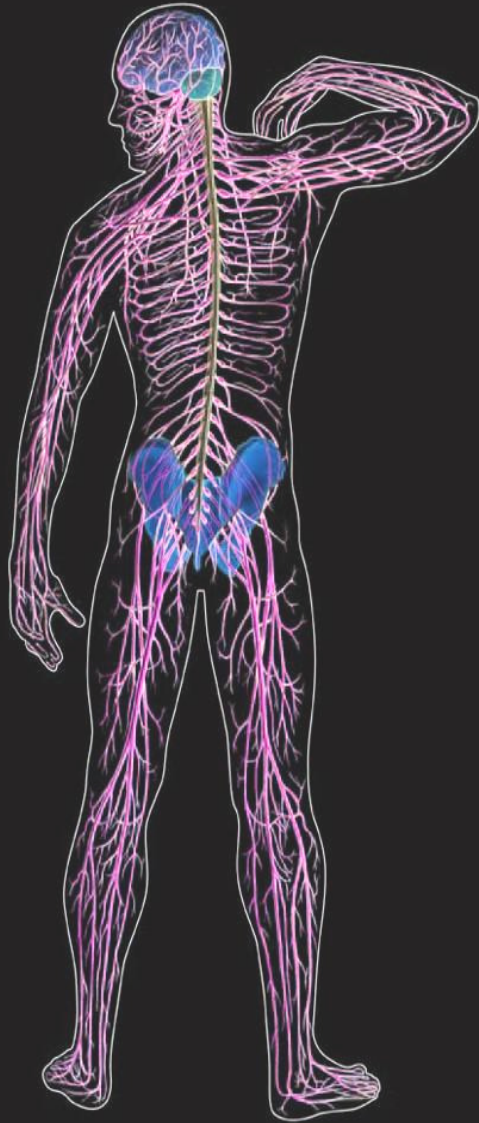
Radial Nerve – Below/At Elbow



Radial Nerve (above elbow)

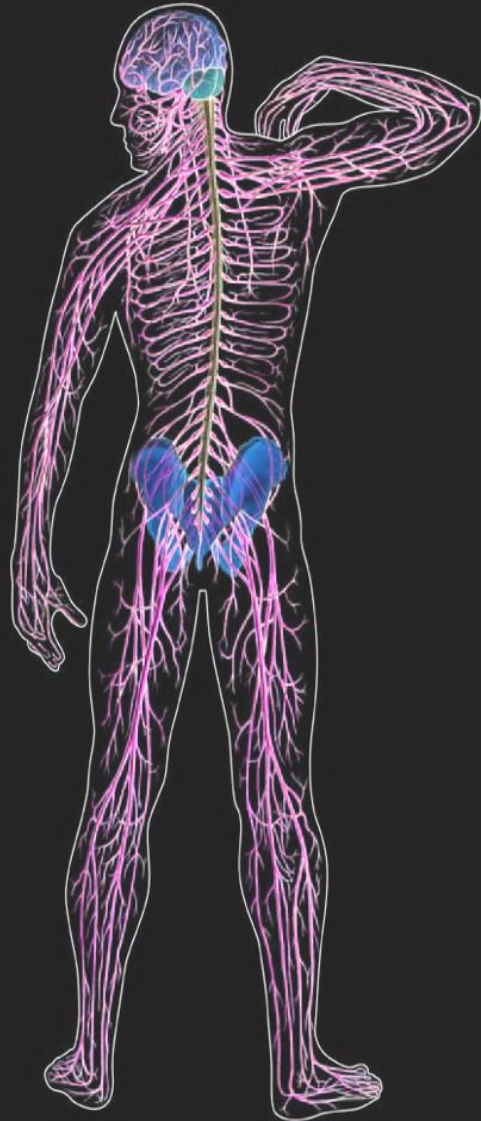


Musculocutaneous Nerve



- http://www.usra.ca/sb_pmus

Practicum



- 4 groups
 1. Needle practice on Phantom
 2. Posterior Tibial
 3. Popliteal
 4. Forearm