

Nerve Block Ultrasound Cheat Sheet

Basics

- Ultrasound-guided nerve blocks are a great alternative to systemic narcotics or procedural sedation
- Ultrasound allows you to directly visualize the nerve & surrounding structures
- Always complete a pre and post block motor & sensory documentation
- Contraindications: infection at injection site, allergy to anesthetic, risk for compartment syndrome, or unable to participate in pre and post anesthesia exam (intoxicated, AMS)

Clinical Indication

- Common upper extremity blocks: radial, ulnar, and median nerves
- Common lower extremity blocks: femoral and popliteal
- Common analgesic uses: burns, fractures, complex wounds
- Common procedural uses: complex laceration repair, fracture reduction, foreign body removal

Technique

Prep

- Consent your patient for the procedure
- Put patient on a cardiac monitor
- Perform and document a motor & sensory exam
- Use sterile technique: put a sterile tegaderm on the probe & use a chlorhexidine prep on the injection site
- For forearm blocks: rest the arm on a firm surface for stability

Scanning Technique

- Use the linear probe (high frequency)
- Hold probe in non-dominant hand & inject with dominant hand
- Nerves look like a bundle of hyperechoic spaghetti or a honeycomb on ultrasound
- Scan surrounding area to look for other vital structures (arteries, veins, tendons, etc)
- Look for area of maximal distance between nerve & surrounding vessels

Injection Technique

- Inject local anesthetic at the injection site
- Prime nerve block needle with anesthetic fluid (don't inject air & ruin your image)

- Insert needle in plane with the probe
- Always visualize the needle tip as you advance it
- Goal is to place anesthetic around the nerve
- Do not inject into the nerve!
- Always aspirate before you inject anesthetic
- Inject next to the nerve, surrounding it with anesthetic
- Redirect your needle as needed to surround the nerve with anesthetic
- Be sure to visualize the anechoic anesthetic fluid on the screen
- When you're done, you should see an anechoic doughnut with a nerve in the center

Radial Nerve Block

- Motor exam: extend wrist and fingers against resistance
- Sensory exam: sensation over dorsal thumb and web space
- Best visualized: at mid forearm
- Start at the wrist and scan proximally

Median Nerve Block

- Motor exam: abduct thumb (touch thumb and index finger together)
- Sensory exam: sensation over palmar thumb to radial ½ of 4th digit
- Best visualized: in the middle of the mid forearm

Ulnar Nerve Block

- Motor exam: abduct 5th digit (touch thumb to 5th digit)
- Sensory exam: sensation over 5th digit and ulnar ½ of 4th digit
- Best visualized: at proximal forearm

Popliteal Nerve Block

- Motor exam: dorsiflexion and plantar flexion of foot
- Sensory exam: sensation over dorsal and plantar foot, and lower leg (except medially)
- Best visualized: just proximal to popliteal fossa
- Patient in prone position or with knee flexed

Femoral Nerve Block

- Innervates femur, hip joint, anteromedial thigh, and all of medial leg
- Motor exam: extension of leg against resistance
- Sensory exam: Sensation over anteromedial thigh and all of medial leg
- Place probe transverse to the inguinal crease
- Locate the femoral artery and scan laterally to find the femoral nerve

Complications to Avoid

Peripheral Nerve Injury

- Reduce risk of this by using ultrasound and visualizing needle tip at all times

- Only inject next to the nerve, never into the nerve
- If patient experiences painful paresthesia, immediately stop

Local Anesthetic Systemic Toxicity (LAST)

- Rare life threatening complication of regional anesthesia
- Caused by intravascular injection or toxic dosing of anesthetic
- Consider in any patient that develops: altered mental status, neurological symptoms, or cardiovascular instability after regional anesthesia
- Treatment is lipid emulsion therapy and ACLS