

Wrist and Hand Blocks

Three wrist blocks (median, ulnar and radial) and metacarpal and digital nerve blocks more distally to provide anesthesia to the hand and digits.

INDICATIONS

- Anesthesia for carpal tunnel release or more distal surgery on the hand and digits

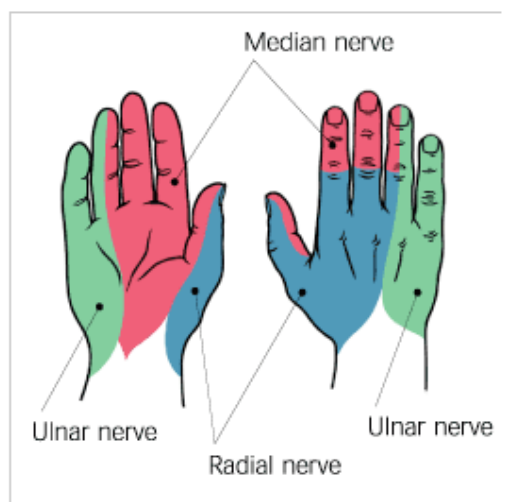
CONTRAINDICATIONS

- **ABSOLUTE**
 - Patient refusal
 - Allergy to LA solution
- **RELATIVE**
 - Coagulopathy
 - Overlying infection
 - Peripheral neuropathy/previous nerve injury
 - Compromised digital perfusion

ANATOMY

(See specific blocks)

INNERVATION



DISTRIBUTION OF ANESTHESIA

TECHNIQUE

N.B. All these blocks assume full sterile precautions and appropriate monitoring and can be performed under U/S guidance

- Avoid epinephrine for all blocks (though no documented adverse outcomes using epi for these blocks)

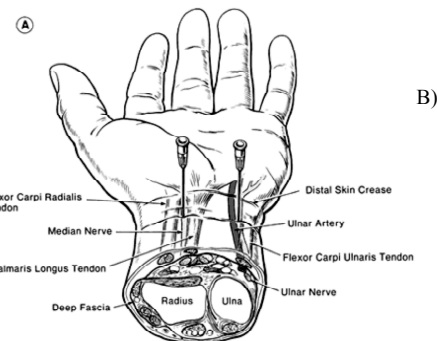
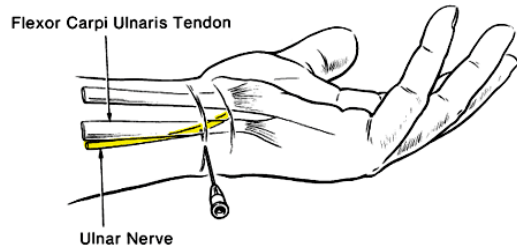
Median nerve block (See image A below)

- Median nerve is located between flexor carpi radialis and palmaris longus tendons
- Insert needle just lateral to palmaris longus and just proximal to the wrist flexor crease at an approximate depth of 1.5 cm
- After negative aspiration, inject 3-5ml LA

Ulnar nerve block (See images A and B below)

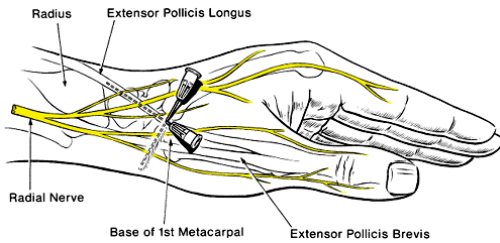
- Ulnar nerve lies between the ulnar artery and the flexor carpi ulnaris tendon
- Between these two landmarks, insert needle and inject 3-5ml of LA at approximately 1.5cm deep
- Alternatively, insert needle from ulnar aspect of wrist just deep to the flexor carpi ulnaris tendon (see in

(B)



Radial Nerve block

- Radial nerve is solely sensory at this point and has branched considerably
- Inject a field block at the anatomic snuffbox, directing needle both volarly and dorsally (primarily dorsal)



Metacarpal nerve block

- The common digital nerves bifurcate just proximal to the metacarpal heads and give rise to dorsal and palmar branches
- They innervate the volar surface of the fingers as well as the dorsal surface of the second, third, and fourth digits just distal to the metacarpophalangeal (MCP) joint

Dorsal Approach (preferred)

- 1 cm proximal to the MCP joint a 25G needle is advanced at 90 degrees to the skin until the tip of the needle is just volar to the surface of the metacarpal heads or until resistance to the palmar aponeurosis is felt. Slight tenting of the skin on the palmar surface of the hand is noted.
- 3-5 mL of LA is injected slowly as the needle is slowly withdrawn dorsally
- Before removing the needle, a subcutaneous wheal is made to block the dorsal branches of the radial or ulnar nerves

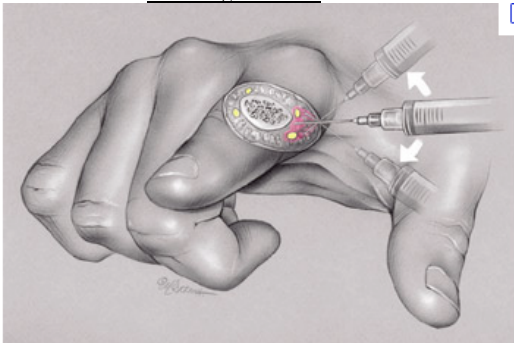
Palmar Approach

- At the distal palmar crease (1 cm proximal to the metacarpal head) a 25-gauge needle is introduced perpendicular to the skin and advanced approximately 1.5 cm dorsally.
- 3-5 mL of LA is injected on both sides of the involved digit

Digital nerve block

Anatomy:

- The digital nerves are derived from the median and ulnar nerves
- The main digital nerves are accompanied by digital vessels, and they run on the ventrolateral aspect of the finger immediately lateral to the flexor tendon sheath.
- Small dorsal digital nerves run on the dorsolateral aspect of the finger and supply innervation to the back of the fingers as far as the proximal joint



Block of Volar and Dorsal Digital Nerves at the Base of the Finger

- A 25-gauge 1½" needle is inserted at a point on the dorsolateral aspect of the base of the finger
- The needle is then directed anteriorly 10 degrees toward the base of the phalanx. The needle is advanced until it contacts the phalanx
- 1cc of LA is injected as the needle is withdrawn 1 to 2 mm from the bone contact. An additional 1 mL is injected continuously as the needle is withdrawn back to the skin.
- The same procedure is repeated on each side of the base of the finger to achieve anesthesia of the entire finger



Transhecal Digital Block (Palmar Block – single needle, painful but recent literature suggests may be preferred by patients)

- The transhecal digital block is placed by using the flexor tendon sheath for local anesthetic infusion.
- With the hand supinated the flexor tendon is located.
- 2 mL of local anesthetic is injected into the flexor tendon sheath at the level of the distal palmar crease. The needle should puncture the skin at a 45-degree angle.
- Resistance to the injection suggests that the needle tip is against the flexor tendon. Careful withdrawal of the needle results in the free flow of medication as the potential space between tendon and sheath is entered.
- Proximal pressure is then applied to the volar surface for the duration of the injection for the diffusion of the medication throughout the synovial sheath.
- The advantage of this approach is the provision of anesthesia to the entire digit with a single injection and a reportedly a higher success rate.



EQUIPMENT

- Sterile procedure tray
- 5-10 ml syringes
- LA solution without epinephrine
- Prep solution
- 30G, 25G and 22G needles of appropriate length
- Sterile gauze, gloves, etc.

COMPLICATIONS

Relatively few

- Intraneural injection/neuronal injury
- Intravascular injection
- Digital ischemia – rare
- Local anesthetic toxicity

REFERENCES

- Cousins 4th (limited info), UpToDate 2010, NYSORA