

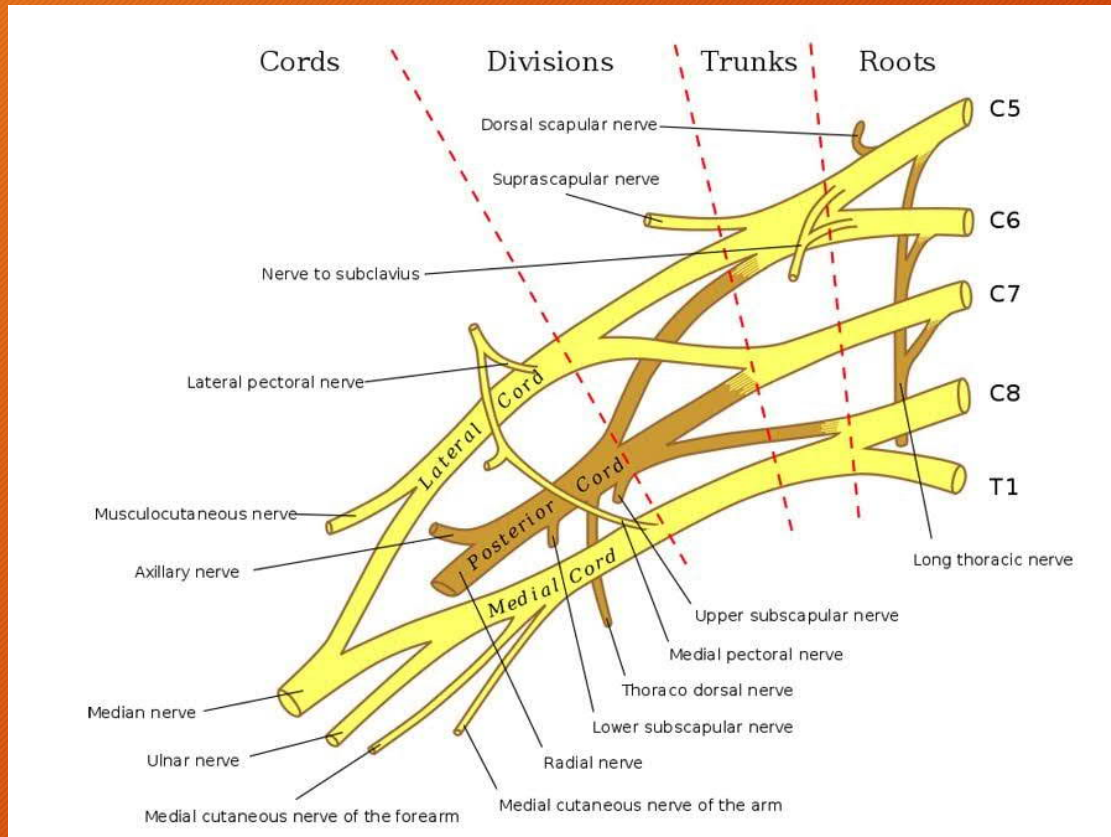
# Upper extremity (brachial plexus) blocks

UTSW Regional Anesthesia/POCUS Workshop

April 12, 2024



# Brachial plexus





# Nomenclature

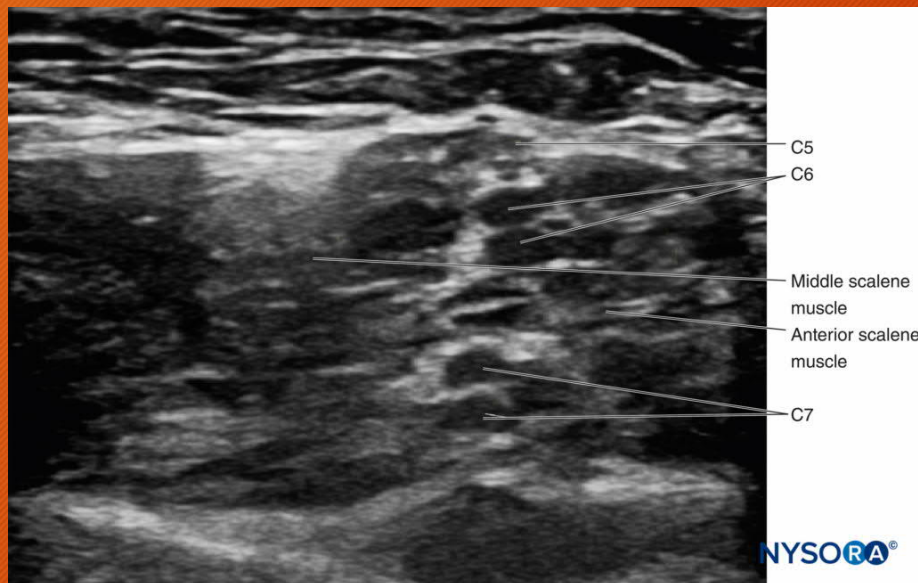
- Precision in communication important to avoid confusion
- Will refer to ASRA-ESRA consensus nomenclature from 2024\*

\*El-Boghdadly K, et al., Standardizing nomenclature in regional anesthesia: an ASRA-ESRA Delphi consensus study of upper and lower limb nerve blocks. Reg Anesth Pain Med. 2024 Nov 4;49(11):782-792. doi: 10.1136/rapm-2023-104884. PMID: 38050174.



# Interscalene brachial plexus block

- Level of injection: roots
- Coverage: shoulder / proximal humerus
- Tip: potentially severely symptomatic phrenic nerve blockade





# Superior trunk block

- Level of injection: (proximal) superior trunk proximal to suprascapular nerve takeoff
- Coverage: shoulder, proximal humerus
- Indication: non-inferior analgesic alternative to interscalene block for potentially less severe phrenic nerve blockade (Kim 2019) (not for patients with severe pulmonary comorbidities)



# Superior trunk block

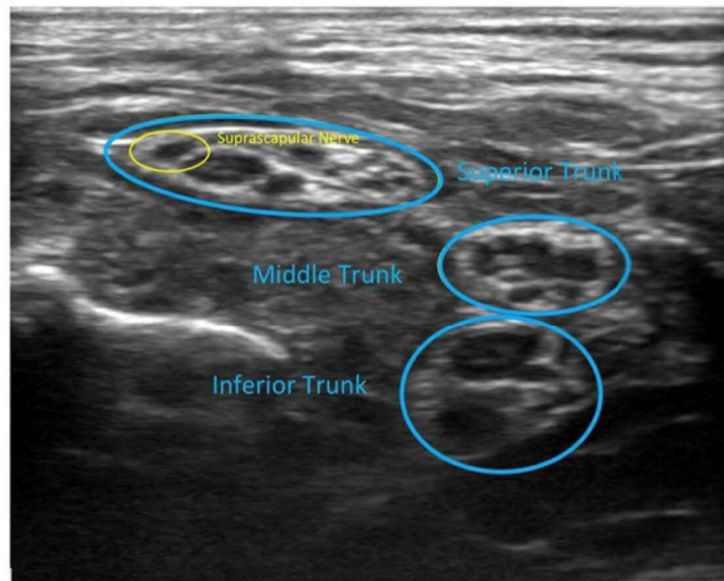


Figure 1: Superior Trunk Block. Yellow circle corresponds to the suprascapular nerve. Blue circles corresponds to the trunks of the brachial plexus.

Kim DH, Lin Y, Beathe JC, Liu J, Oxendine JA, Haskins SC, Ho MC, Wetmore DS, Allen AA, Wilson L, Garnett C, Memtsoudis SG. Superior Trunk Block: A Phrenic-sparing Alternative to the Interscalene Block: A Randomized Controlled Trial. *Anesthesiology*. 2019 Sep;131(3):521-533.

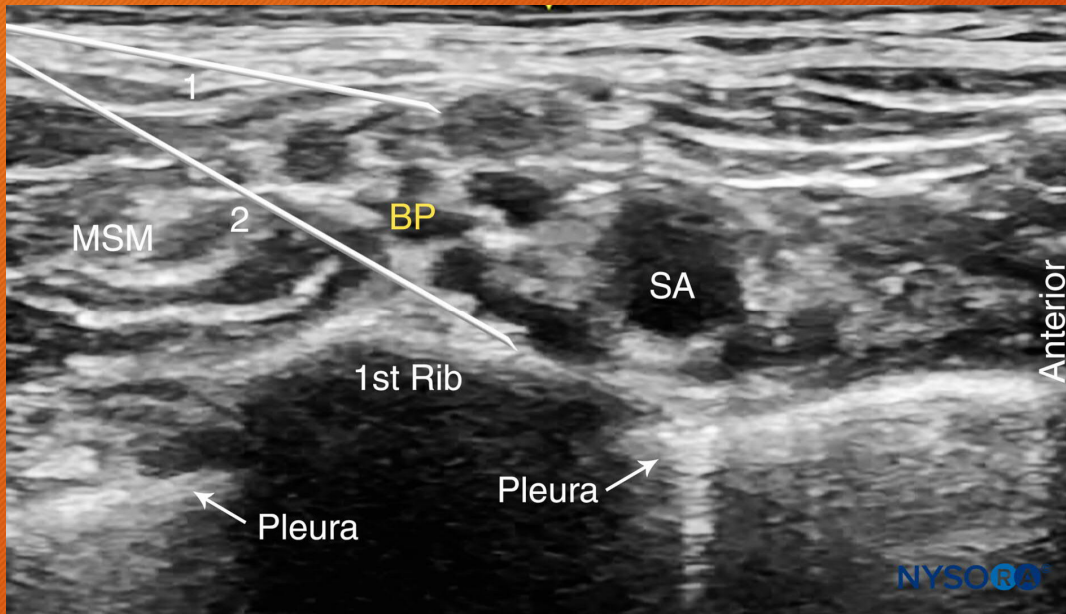


# Supraclavicular brachial plexus block

- Level of injection: distal trunks / proximal divisions cephalad to clavicle
- Coverage: upper extremity distal to shoulder, spares upper inner arm
- Tips:
  - phrenic nerve blockade possible
  - Injection just in the “corner pocket” may not completely cover superior trunk distribution
  - Injection of the most superficial aspect of plexus may result in ulnar sparing
  - Use color doppler to ID vasculature (e.g. dorsal scapular artery)
  - Visualization of first rib for pleural protection



# Supraclavicular block



Bendtsen T, Lopez A, Vandepitte C, Ultrasound-Guided Supraclavicular Brachial Plexus Nerve Block. NYSORA. <https://www.nysora.com/topics/regional-anesthesia-for-specific-surgical-procedures/upper-extremity-regional-anesthesia-for-specific-surgical-procedures/anesthesia-and-algesia-for-elbow-and-forearm-procedures/ultrasound-guided-supraclavicular-brachial-plexus-block/>

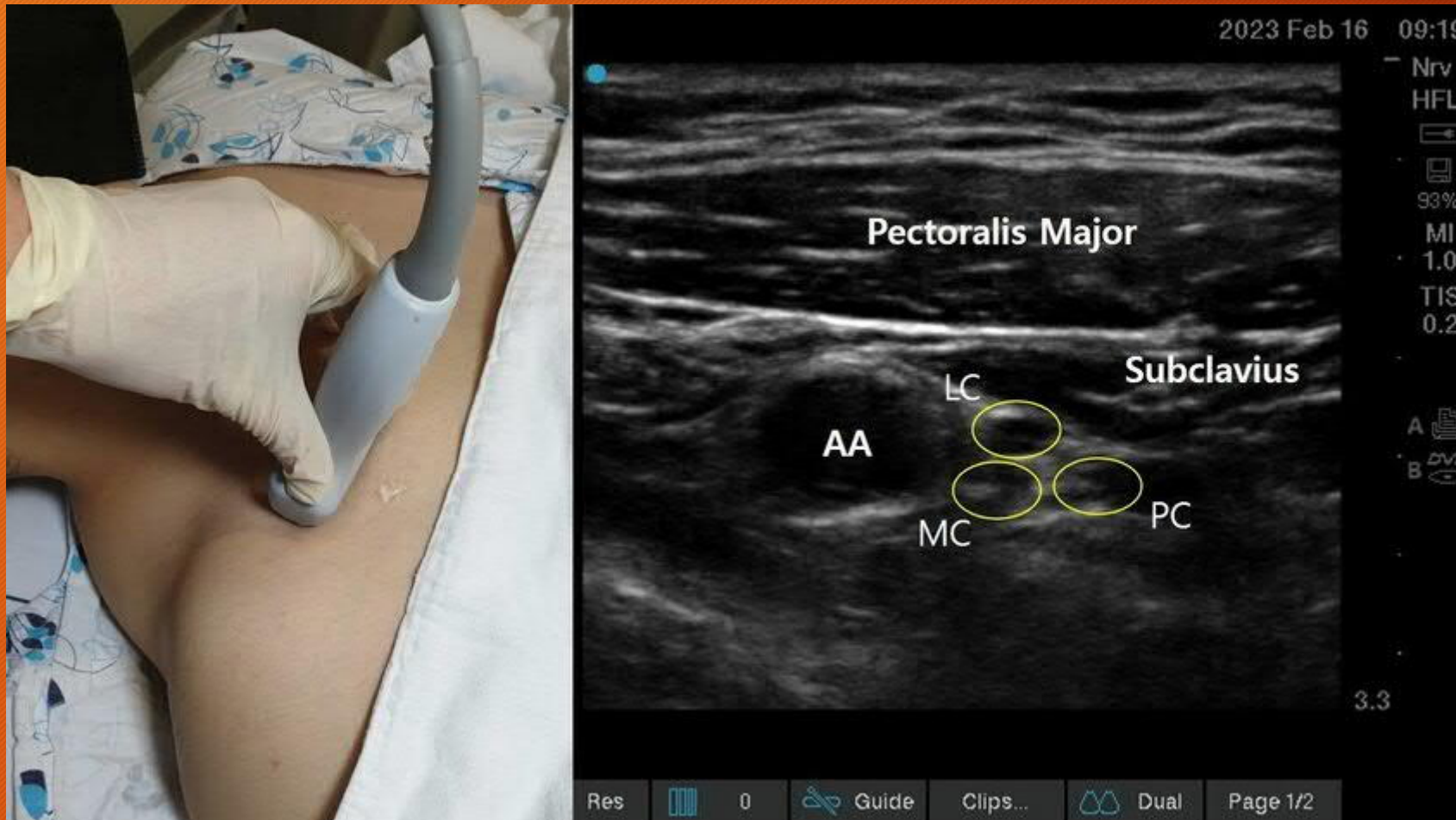


# Infraclavicular brachial plexus block

- Level of injection: cords (caudad to clavicle)
- Coverage: upper extremity distal to shoulder, spares upper inner arm
- Tips:
  - minimal phrenic nerve blockade risk
  - Identify all three cords under ultrasound; consider more than one injection if injectate does not spread to all 3 cords for higher chance of complete block
- Two approaches: costoclavicular approach (medial infraclavicular fossa—more proximal), coracoid approach (classical approach, lateral infraclavicular fossa—more distal)



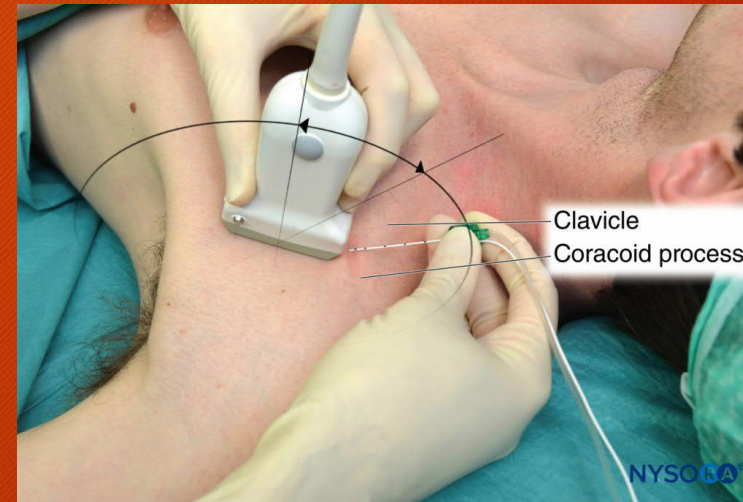
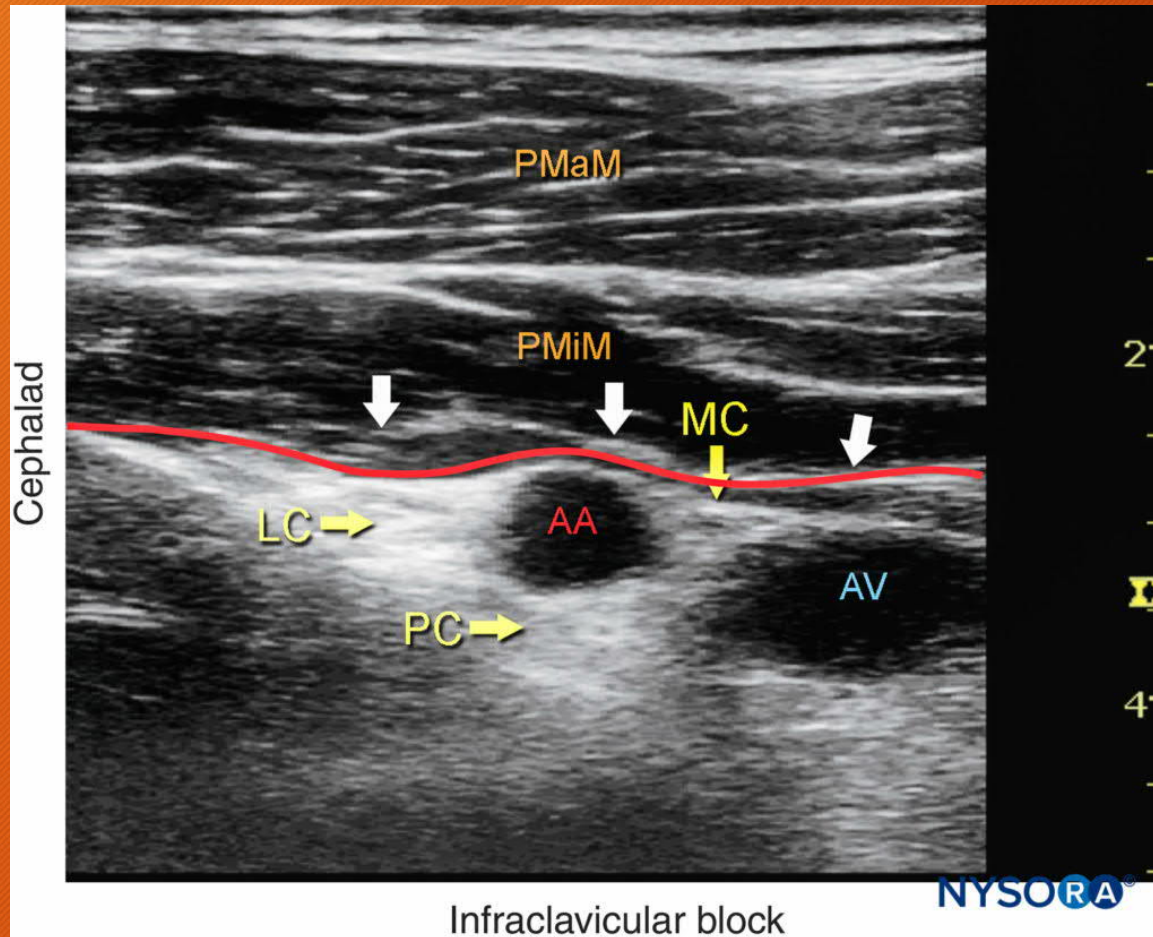
# Infraclavicular block, costoclavicular approach



Koo C, Hwang I, Shin H, Ryu J, Hemidiaphragmatic paralysis after costoclavicular approach versus other brachial plexus blocks in upper limb surgery: a meta-analysis. Korean Journal of Anesthesiology. 2023. 76.



# Infraclavicular block, coracoid approach



Atchabahian A, Vandepitte C, Lopez A, Ultrasound-Guided Infraclavicular Brachial Plexus Nerve Block. NYSORA. <https://www.nysora.com/topics/regional-anesthesia-for-specific-surgical-procedures/upper-extremity-regional-anesthesia-for-specific-surgical-procedures/ultrasound-guided-infraclavicular-brachial-plexus-block/>

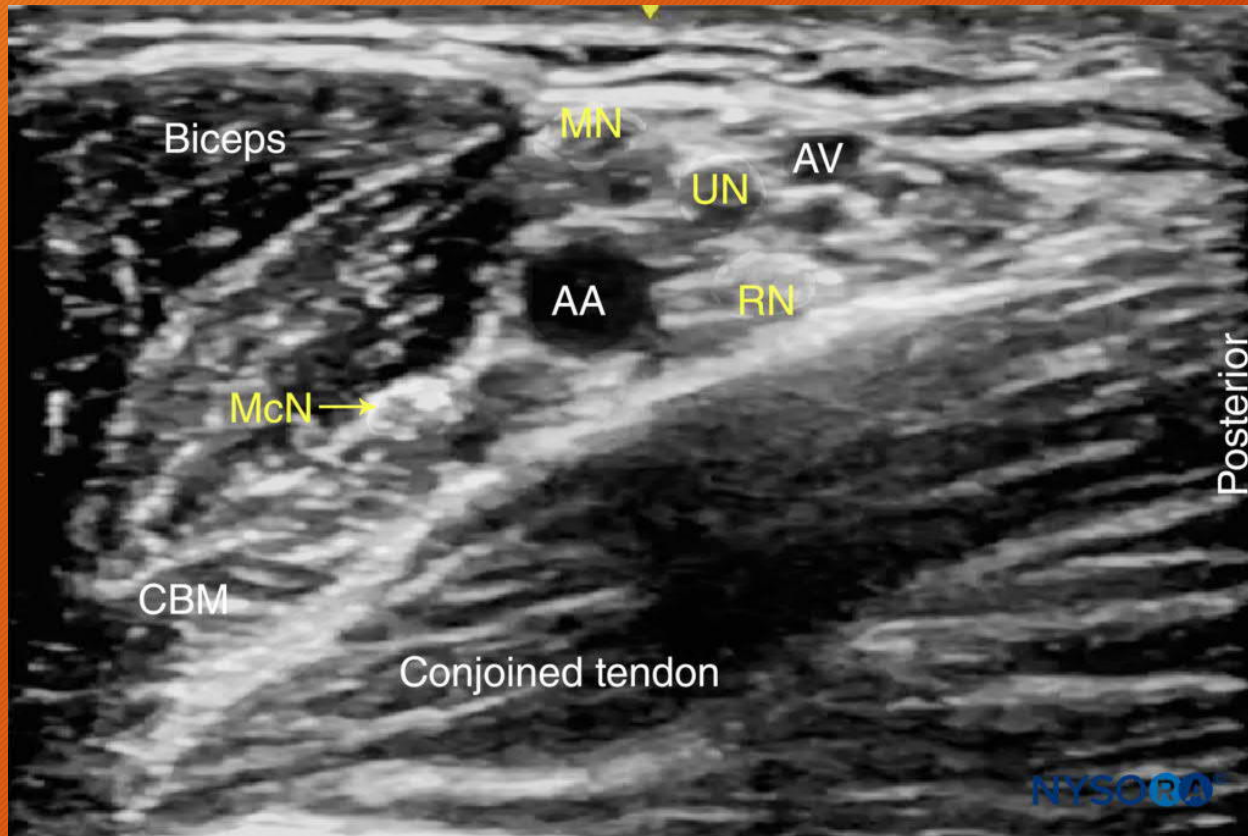


# Axillary brachial plexus block

- Level of injection: branches of brachial plexus in axilla
- Coverage: upper extremity distal to shoulder, spares upper inner arm, spares axillary nerve distribution
- Tips:
  - Musculocutaneous nerve requires separate injection in most patients
  - Location of radial, median, ulnar nerves in relation to axillary vasculature varies widely
  - Multiple injections may be necessary to cover all 4 nerves
  - No risk of phrenic nerve blockade
- Note: be cautious with terminology to avoid confusion with blockade of axillary nerve



# Axillary brachial plexus block



Vandepitte C, Lopez A, Jalil H. Ultrasound-Guided Axillary Brachial Plexus Block. NYSORA.

<https://nysora.com/techniques/upper-extremity/axillary/ultrasound-guided-axillary-brachial-plexus-block/>



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- Atchabahian A, Vandepitte C, Lopez A, Ultrasound-Guided Infraclavicular Brachial Plexus Nerve Block. NYSORA. <https://www.nysora.com/topics/regional-anesthesia-for-specific-surgical-procedures/upper-extremity-regional-anesthesia-for-specific-surgical-procedures/ultrasound-guided-infraclavicular-brachial-plexus-block/>
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