

Block of the Month

Axillary Block

The axillary block is an excellent regional anesthetic of the mid-humerus, arm, elbow, forearm, and hand, that may spare the upper humerus and shoulder. Overall, the structures of interest are easy to view and there are fewer critical structures to avoid; thus, this is an appropriate block for early learners of ultrasound-guided regional anesthesia.¹ Selective blockade of the axillary nerve for arthroscopic subacromial decompression has been shown to decrease pain scores, although this response is unpredictable and variable.²

Unique Contraindications:

- Usual absolute contraindications such as patient refusal and infection at the site are applicable
- This is a compressible site and therefore the risk/benefits of proceeding in someone who is anticoagulated should be balanced.
- There are no unique contraindications specific to the axillary block.

Complications:³

- Hematoma
- Infection
- Vascular puncture
- Inadequate anesthesia as the shoulder and proximal humerus are spared
- Local anesthetic systemic toxicity
- Nerve injury
- Bruising
- —would this be due to LAST?

Note: The axillary block is may be a good option in patients with underlying respiratory compromise as it minimizes risks of pneumothorax, respiratory collapse, diaphragmatic paralysis, etc.

Ultrasound-Guided Technique:³

- The patient is positioned supine with the arm abducted 90 degrees and externally rotated.
- The axillary crease is identified, and the linear ultrasound probe placed in a parasagittal direction
- The probe is then centered over the axillary artery, adjusting frequency, gain, and depth to best optimize this image

- The median, radial, ulnar, and musculocutaneous nerves are visualized and identified, the actual locations of the nerves is variable and if you need to block one specific nerve you will need to incorporate nerve stimulator or paresthesia. The most common locations are listed below.
 - The median nerve is located most laterally around the artery
 - The radial nerve is located deep to the artery
 - The ulnar nerve is located most medially around the artery, near the axillary vein
 - The musculocutaneous nerve is visualized by looking between the biceps brachii and coracobrachialis muscles
- Insert the needle from the lateral portion of the brachial plexus and advance to the 6:00 position of the axillary artery, injecting local anesthetic near the radial nerve. Withdraw the needle to the 9:00 position, injecting additional local anesthetic near the median nerve. Re-insert the needle, if necessary, to target the ulnar nerve near the 3:00 position.
- Re-insert the needle to target the musculocutaneous nerve, inject local anesthetic around the structure
- Insert the needle in plane with the ultrasound probe, visualizing the entire needle while advancing
- Inject local anesthetic in increments, aspirating for heme after every 5 ml of local anesthetic injection

Tips:

- Ultrasound-guidance allows for both the traditional selective blockade of individual nerves as well as perivascular infiltration (appears as a donut sign), allowing for application to a patient's unique anatomy⁴
- Appreciate features of arterial and venous structures on ultrasound, maximizing the use of Doppler flow

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References:

1. Nowakowski P, Bierylo A. Ultrasound guided axillary brachial plexus block part 1 – basic sonoanatomy. *Anaesthesiol Intensive Ther.* 2015; 47(4); 409-416.
2. Rothe C, Lung J, Troels Jenstrup M, Steen-Hansen C, Hyldborg Lundstrom L, Molgaard Andreasen A, et al. A randomized controlled trial evaluating the impact of selective axillary nerve block after arthroscopic subacromial decompression. *BMC Anesthesiology.* 2020; 20(1): 1-8.
3. Tran DQH, Dugani S, Asenjo JF. Upper extremity nerve blocks. In: Kaye AD, ed. *Essentials of Regional Anesthesia.* New York, NY: Springer; 2012: 339-384.
4. Nowakowski P, Bierylo A. Ultrasound guided axillary brachial plexus block part 2 – technical issues. *Anaesthesiol Intensive Ther.* 2015; 47(4); 417-424.