

Beyond the Brachial Plexus:

Isolated Axillary Circumflex & Suprascapular Nerve Blocks for Shoulder Surgery

SEPTEMBER 9 | 7-8:30 p.m. CDT



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ASPM
FELLOWSHIP

Learner Outcomes

1

Brachial Plexus

Describe the functional anatomy of the brachial plexus and key anatomic landmarks for performing upper trunk, suprascapular, and axillary nerve blocks.

2

Demonstration

Perform ultrasound-guided upper trunk, suprascapular, and axillary nerve blocks, highlighting key landmarks, transducer placement, procedural steps, and common local anesthetic dosing strategies.

Ultrasound-Guidance

There is no technology that has impacted the practice of regional anesthesia more than the incorporation of ultrasound.

In the beginning...ultrasound-guided peripheral nerve blocks were just an extension of traditional landmark technique.

Over time, expert clinicians have used ultrasound to create procedures that are not possible using landmark technique.

Regional Anesthesia

There are 5-7 peripheral nerve blocks every anesthesia provider should master.

These vary depending on the needs of your practice

There are scenarios that limit or prevent their use. Adding alternative approaches to your toolbox will improve patient outcomes and satisfaction.

Blocks must be simple (ish)

Low complication profile

Can be used in multiple situations

Shoulder Surgery

Traditional brachial plexus blocks

Interscalene Brachial Plexus Block (ISBPB)

Supraclavicular Block

Infracavicular Blocks

Axillary Plexus Block

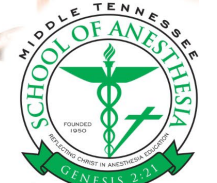
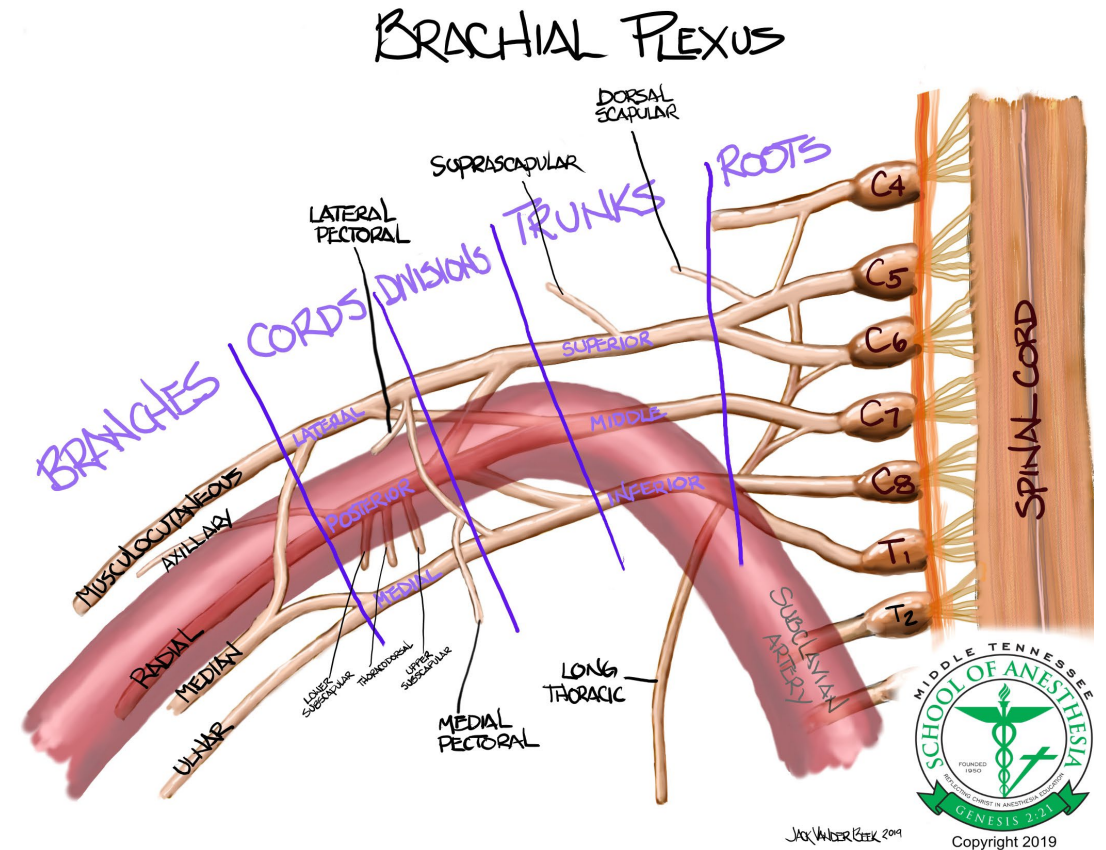
Four options are good, right?

Only one option that effectively covers shoulder surgery.

Brachial Plexus

Supplies the majority of sensory and motor innervation to the upper extremity.

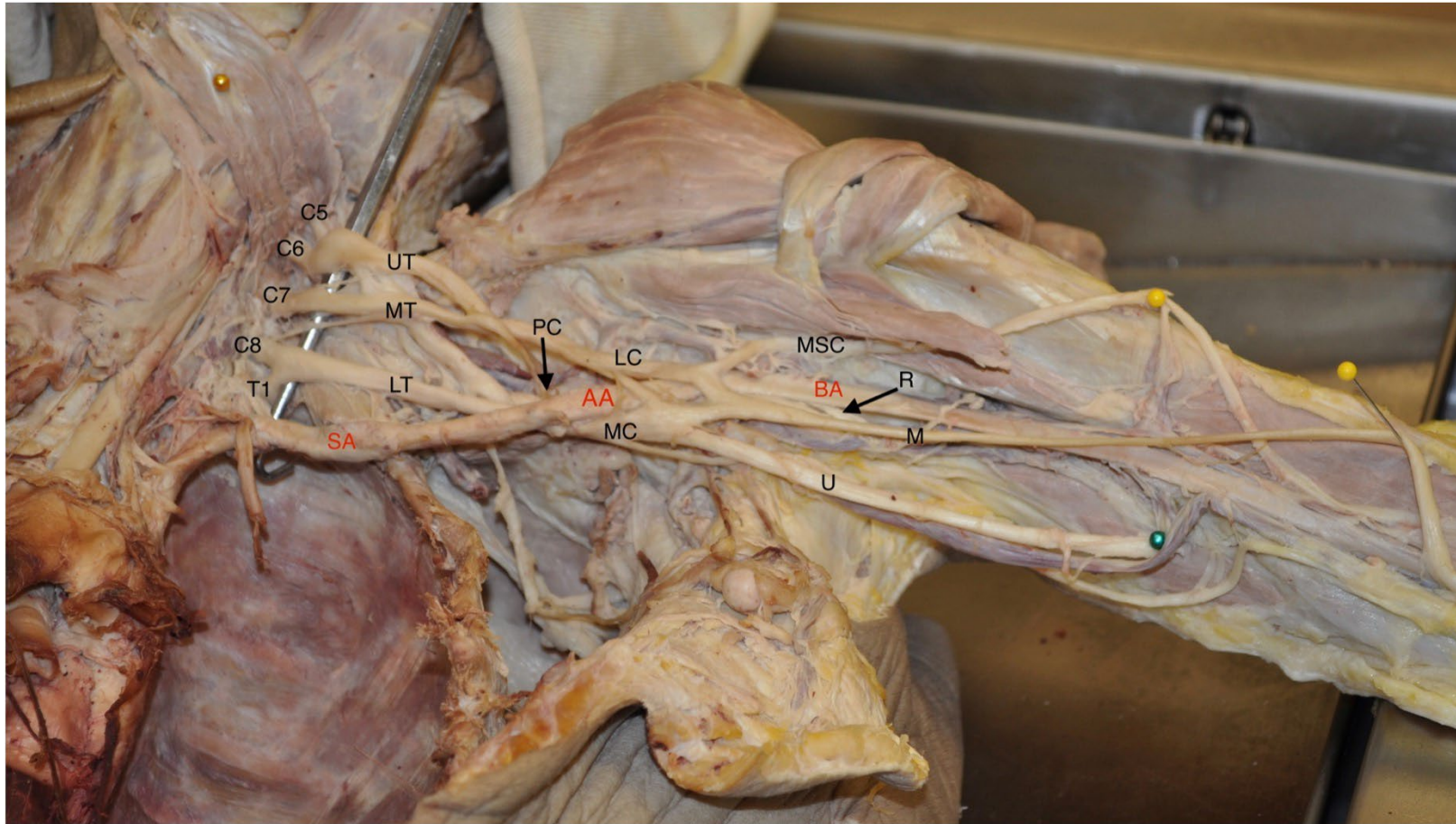
We are taught it looks like this...



JACK WILDER KREK 2019

Copyright 2019

...or this



Brachial Plexus

In reality, the nerves are more compact than depicted

ISBPB complication profile

- Pneumothorax

- Local anesthetic systemic toxicity (LAST) event

- Vessel puncture/bleeding/hematoma

- Nerve injury – direct and indirect

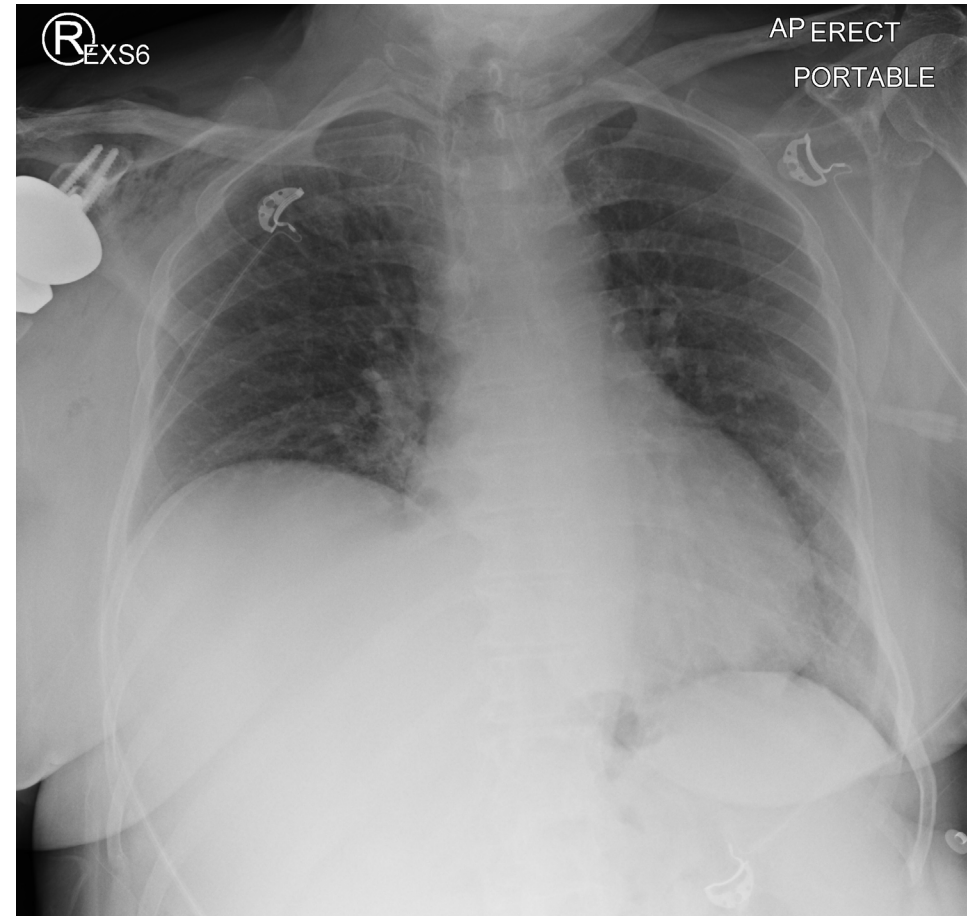
- Phrenic nerve palsy**



Phrenic Nerve Palsy in ISBPPB

Historically, the phrenic nerve was blocked nearly 100% of the time following an ISBPPB.

Recent changes in technique, local anesthetic dosing are aimed at reducing this.

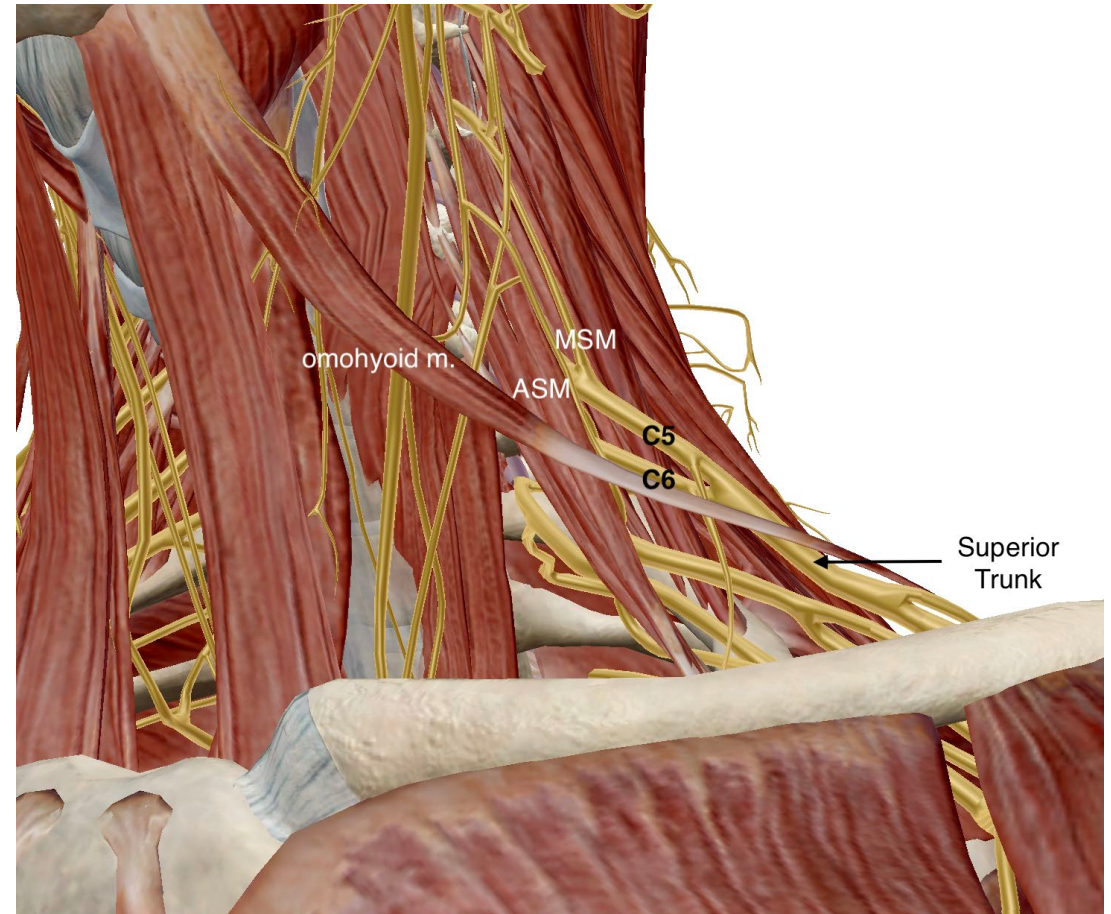


Superior Trunk Block

First described in 2014, it targets the superior trunk (C5–C6) distal to the ISBPB level at the level of the omohyoid muscle in the supraclavicular fossa.

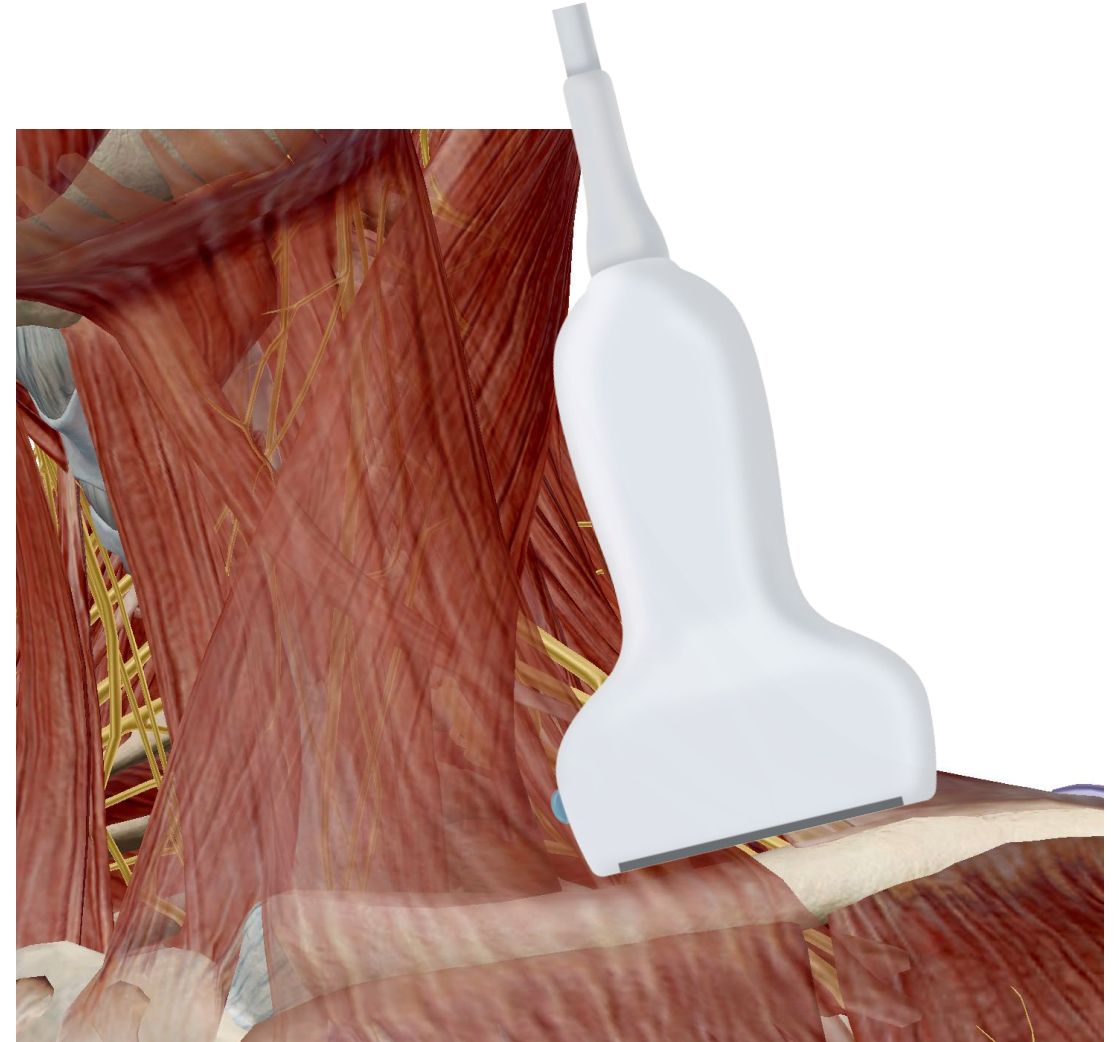
Suprascapular n.

Axillary n.



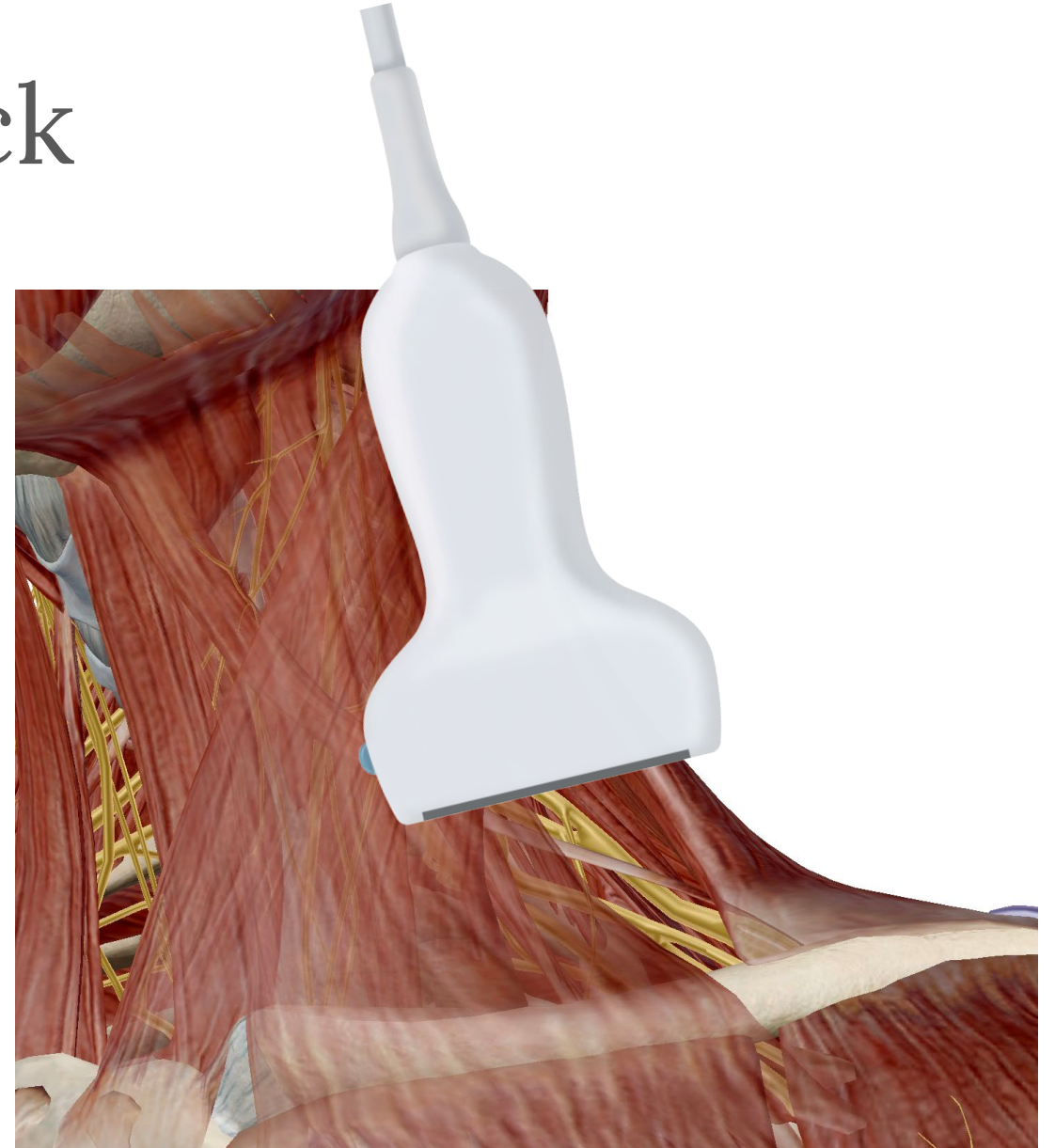
Superior Trunk Block

Transducer placed in transverse in supraclavicular fossa and slid cephalad as performing an ISBPB



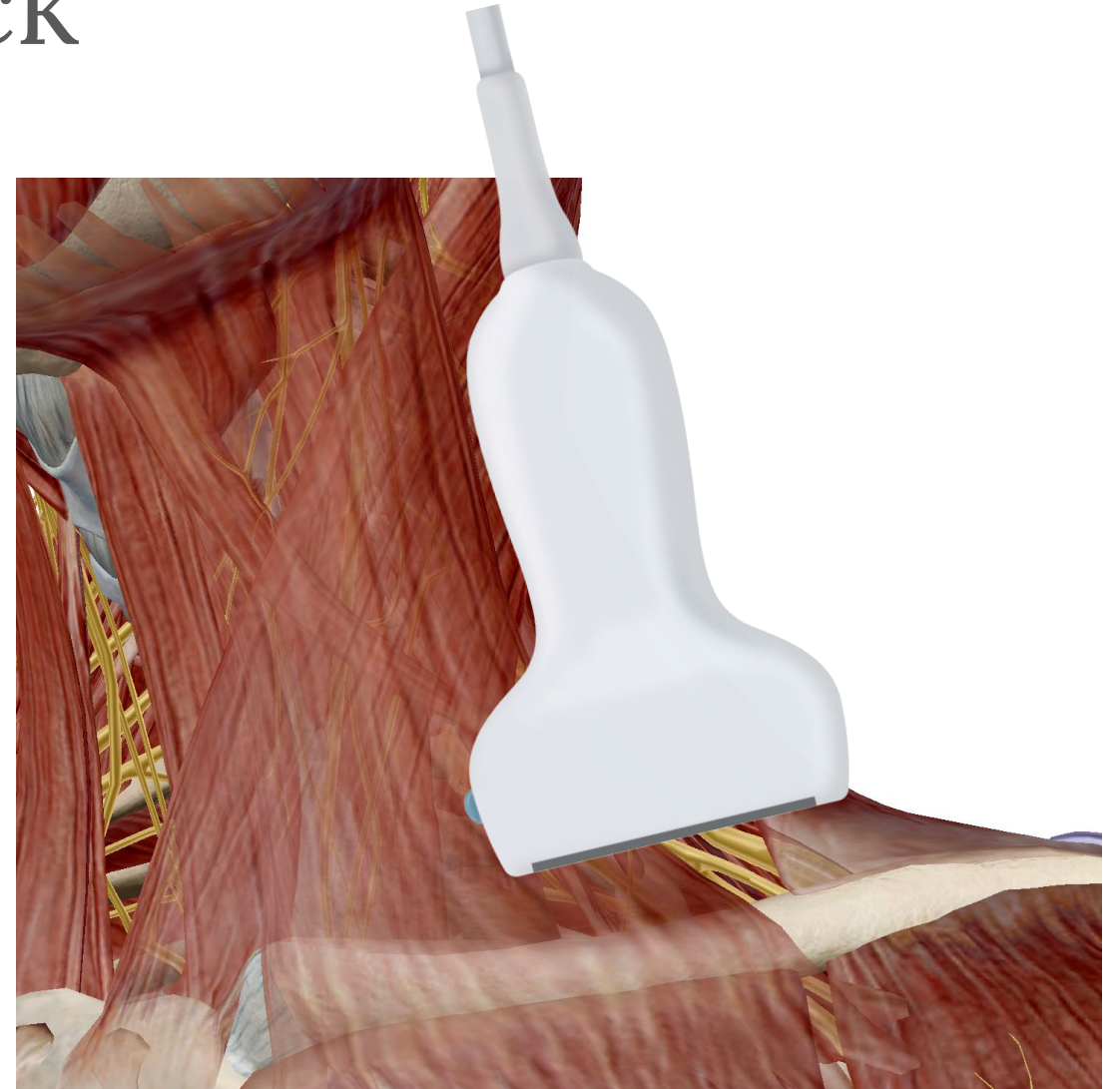
Superior Trunk Block

Transducer placed in transverse in supraclavicular fossa and slid cephalad as performing an ISBPB



Superior Trunk Block

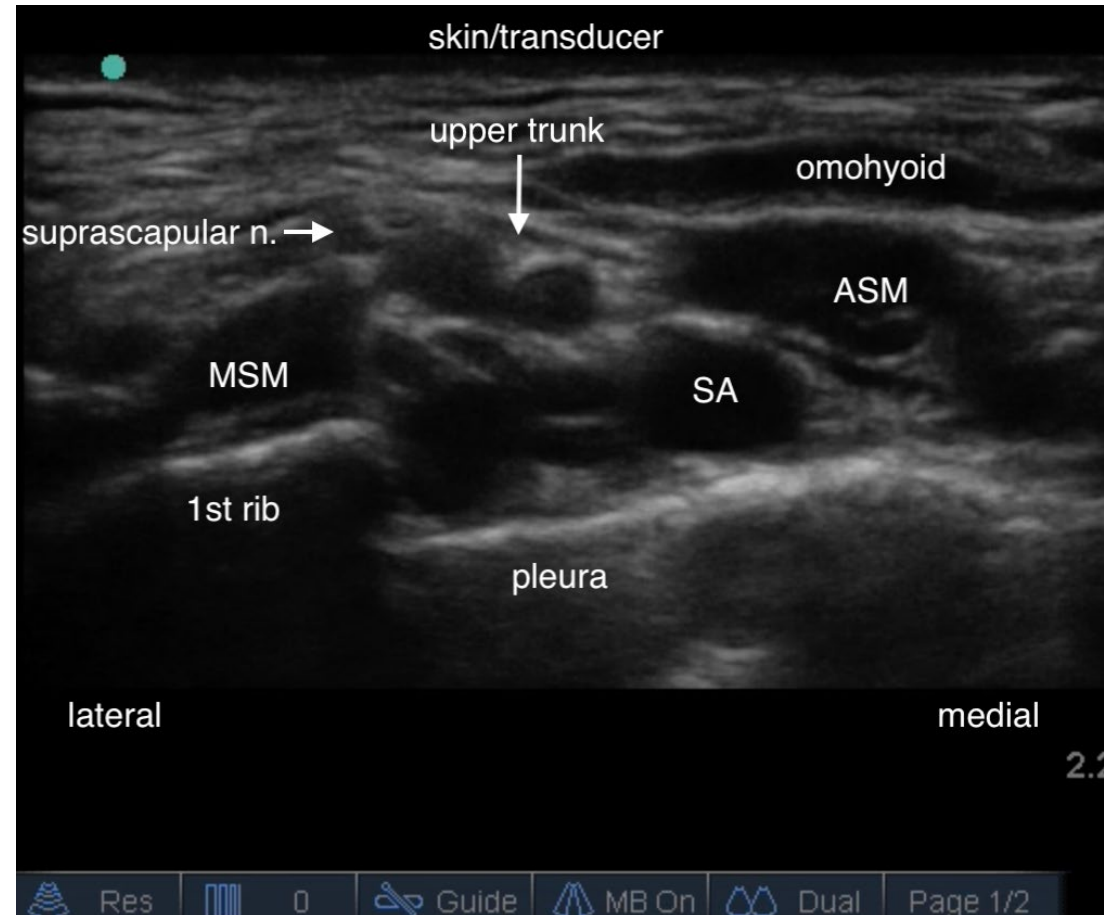
Transducer then slid caudal to point where suprascapular nerve branches off superior trunk



Superior Trunk Block

C5-6 nerves roots at the interscalene level

Scan distally to level where the suprascapular nerve branches of superior trunk



Superior Trunk Block

Needle is passed in-plane lateral to medial

Must pierce the deep cervical fascia

Inject 10-15 mL local anesthetic deep to trunk

Circumferential spread not necessary if used as an analgesic block



Superior Trunk Block

Advantages

Noninferior pain relief to ISBPB

Reduced incidence of
diaphragmatic hemiparesis

~ 5% vs. 70%

Disadvantages

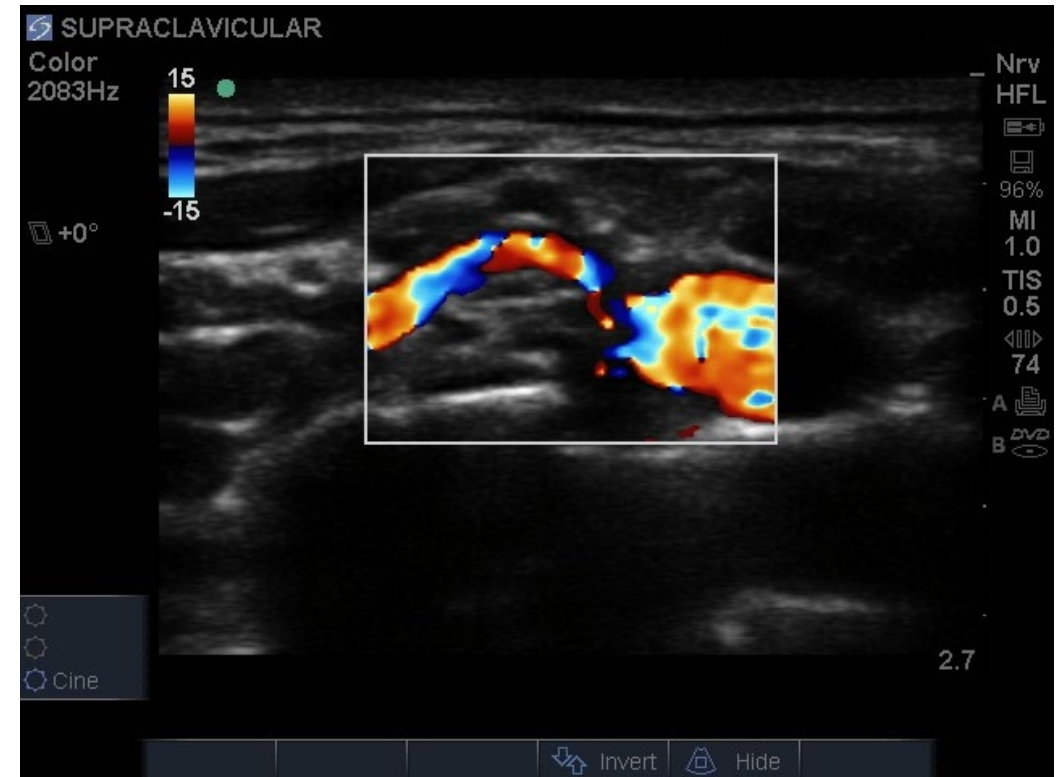
Pneumothorax

Vascular puncture

Bleeding and hematoma

LAST

Nerve injury



Suprascapular and Axillary Block

Isolates and targets the main innervation to the shoulder at the scapula and proximal upper arm.

Described as a landmark technique

In 2021, a meta-analysis of comparing the suprascapular and axillary nerve block to the ISBPB for arthroscopic shoulder surgery from 2010-2021, found it was a safe and effective alternative, especially in patients with severe pulmonary disease and morbid obesity. Medicine. 2021



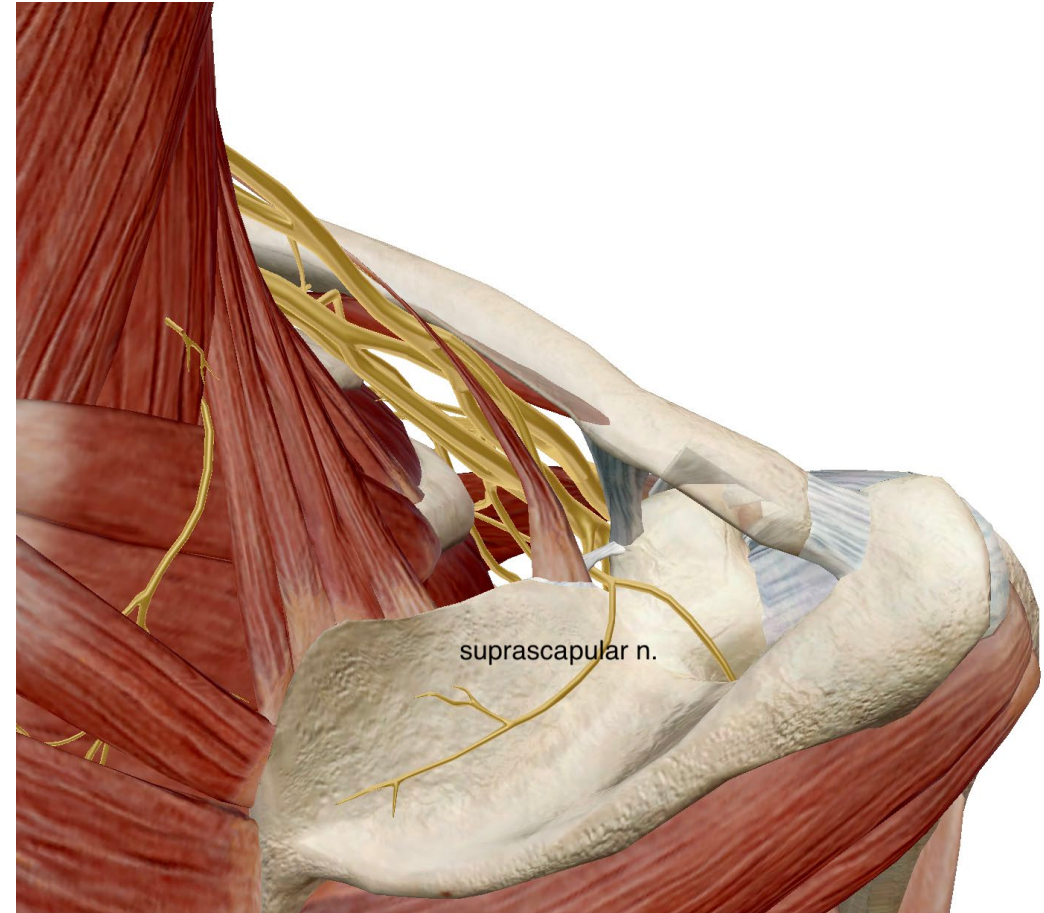
Suprascapular Nerve Block (posterior approach)

Suprascapular Nerve Block

Suprascapular nerve is the lateral branch of the superior trunk.

Provides sensory and motor innervation to the scapular

Takes a posterior course across the triangle of the neck and parallel to inferior omohyoid and deep to trapezius

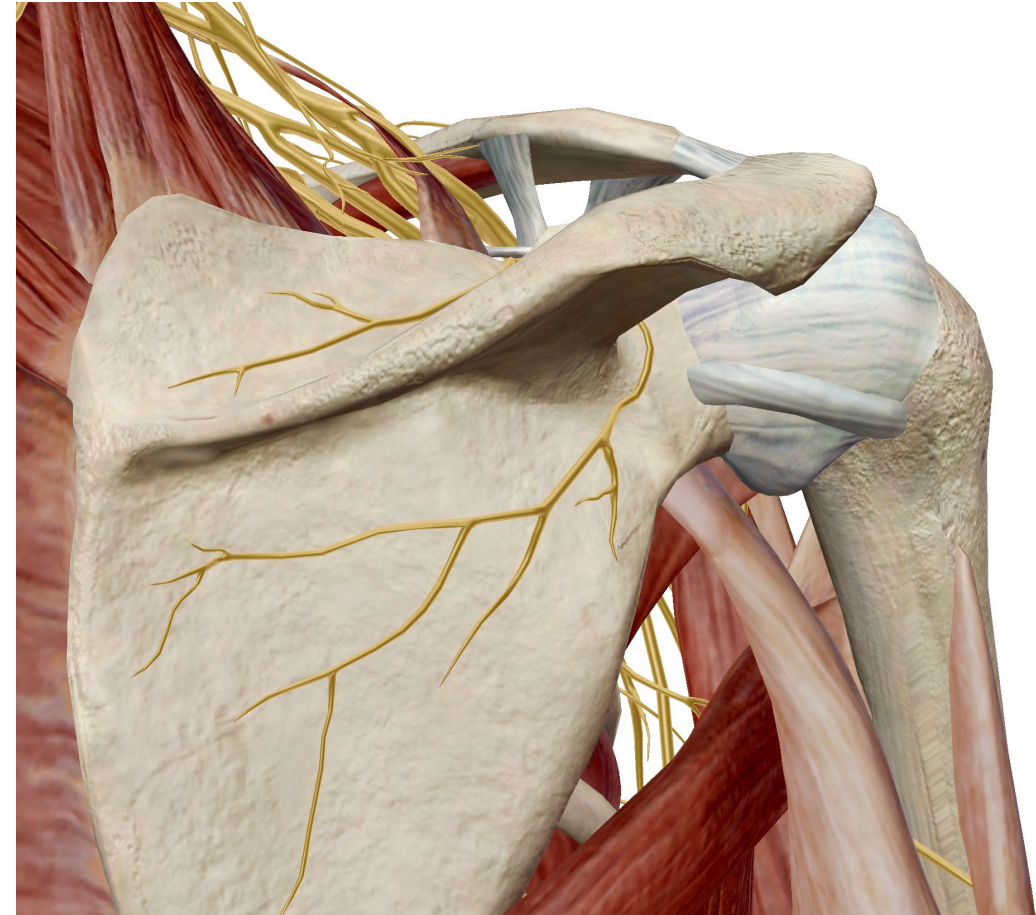


Suprascapular Nerve

Passes through scapular notch under superior transverse scapular ligament

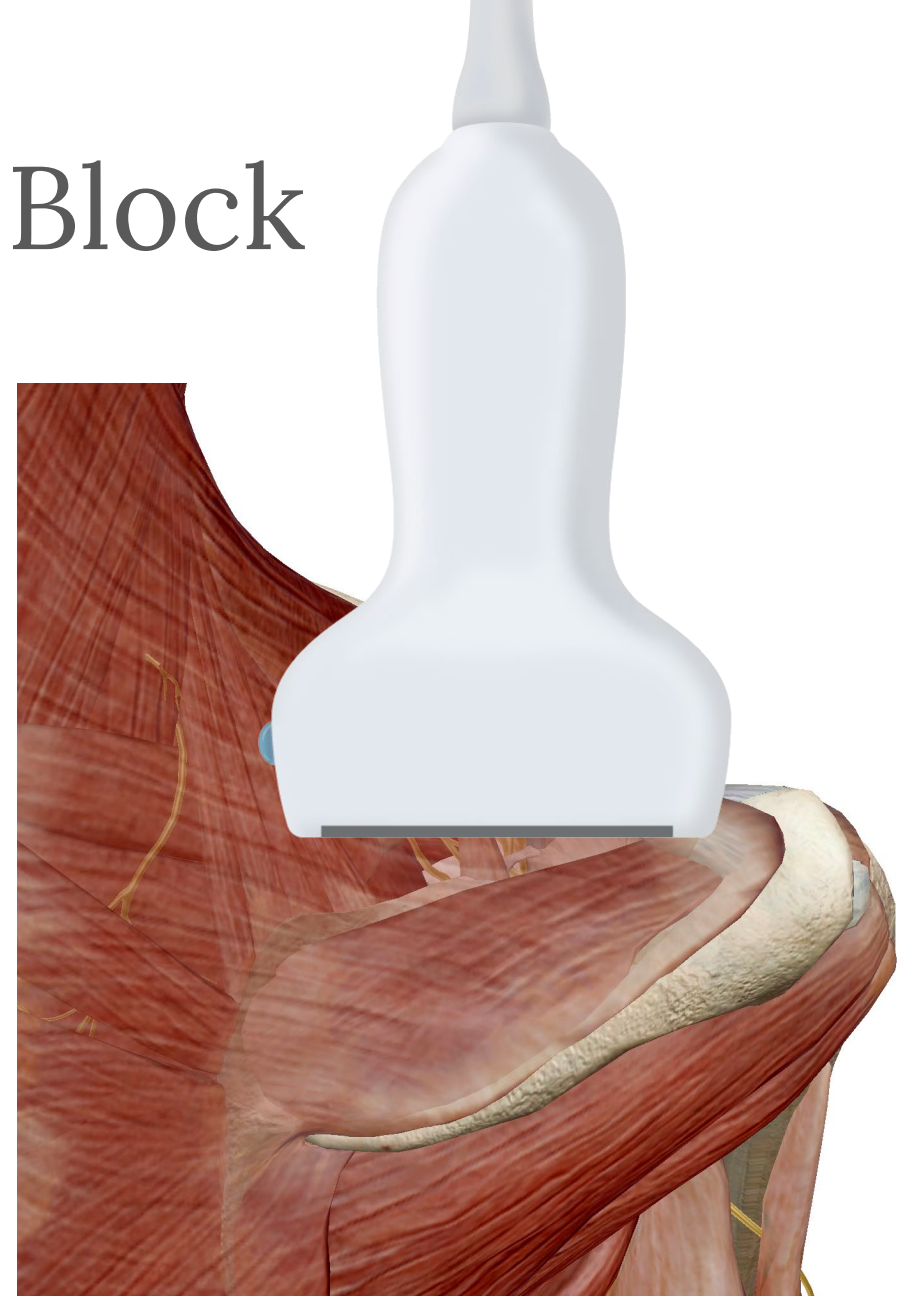
Courses along supraspinous fossa under supraspinatus

Curves around lateral border through the spinoglenoid notch to infraspinous fossa



Suprascapular Nerve Block

Transducer placed in transverse orientation on trapezius just medial to acromioclavicular ligament facing caudal.

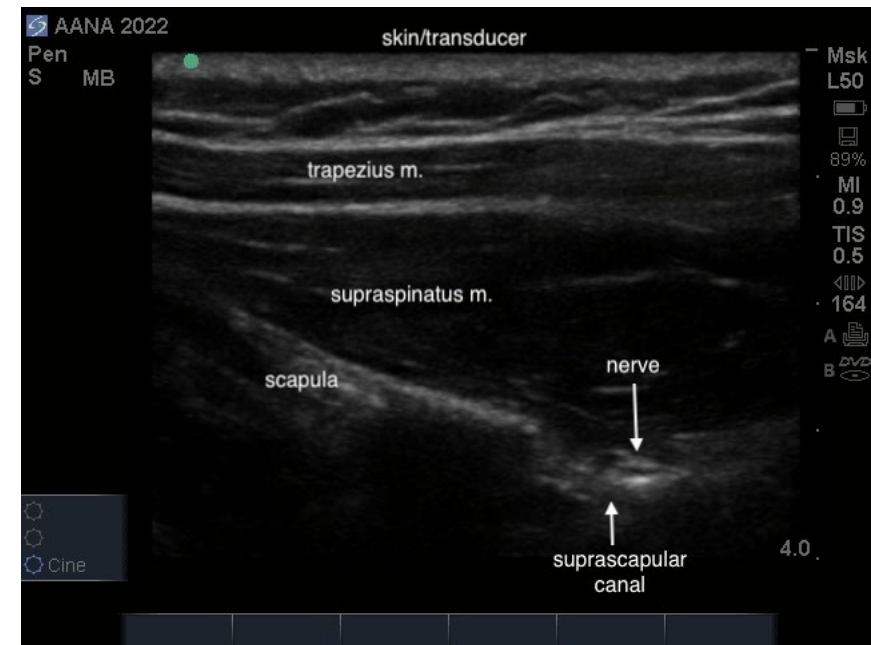


Suprascapular Nerve Block

Identify hyperechoic border of scapula, then differentiate trapezius and supraspinatus muscle

Follow border of scapula to the canal

Use color Doppler to identify the suprascapular artery



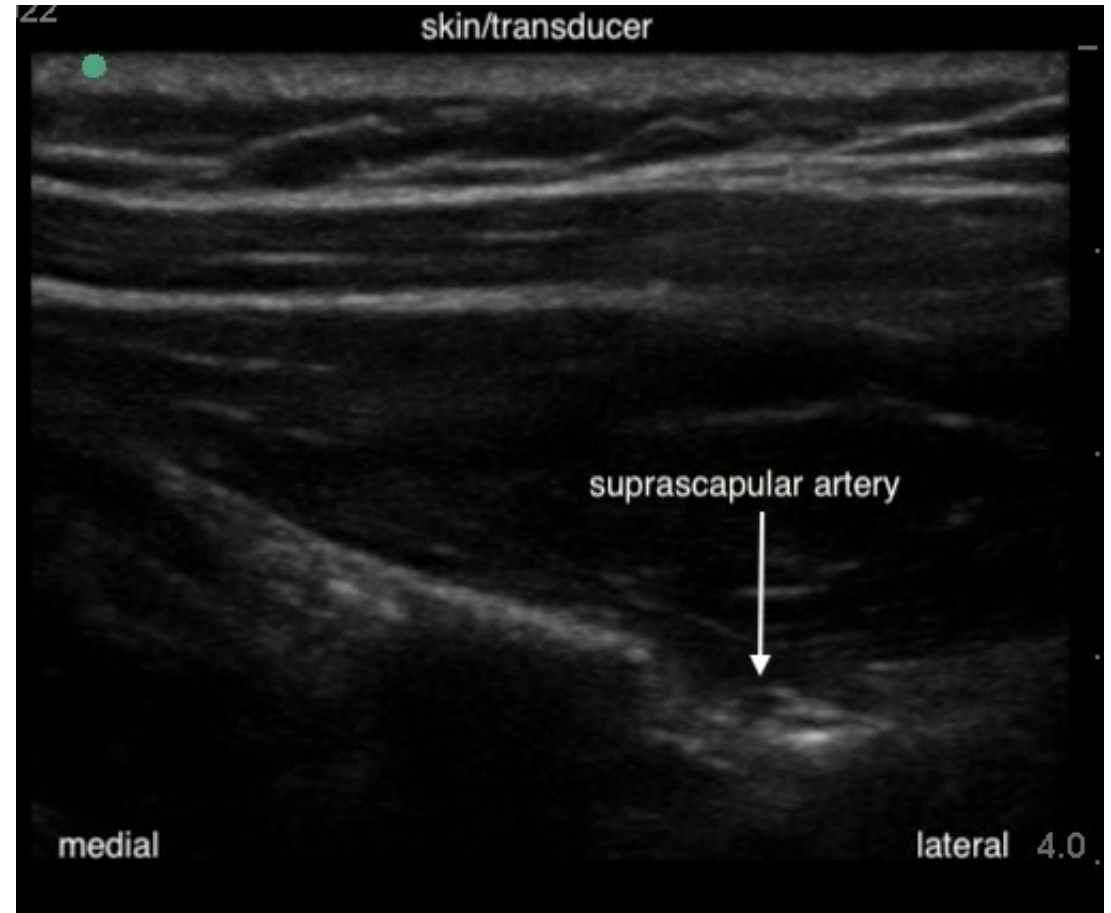
Suprascapular Nerve Block

Needle is passed using an in-plane technique medial to lateral below the supraspinatus ligament later to nerve an artery.

Must pierce the superior transverse scapular ligament

Follow negative aspiration, inject 10 mL of local anesthetic

Be careful to avoid the suprascapular artery





Axillary Nerve Block at the Humeral Circumflex

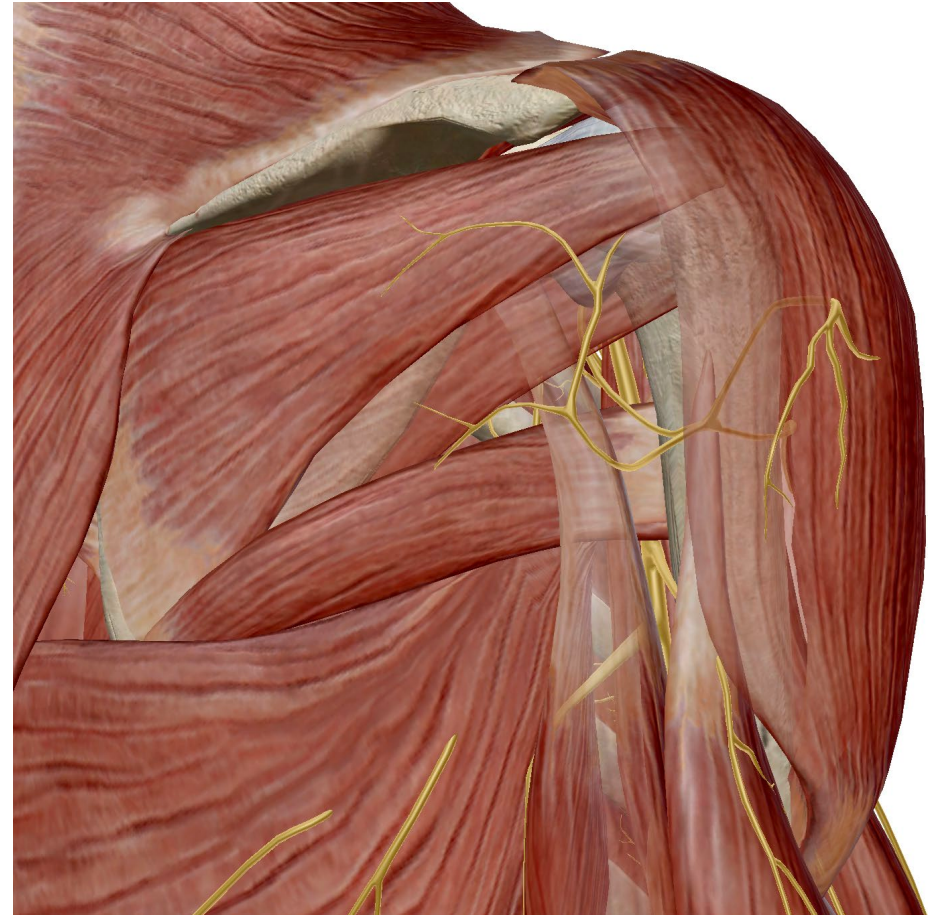
Axillary Nerve Block

Arises from the posterior cord of the brachial plexus

Anterior branch

Winds around the neck of the humerus with posterior circumflex humeral artery

Motor innervation of the deltoid



Axillary Nerve Block

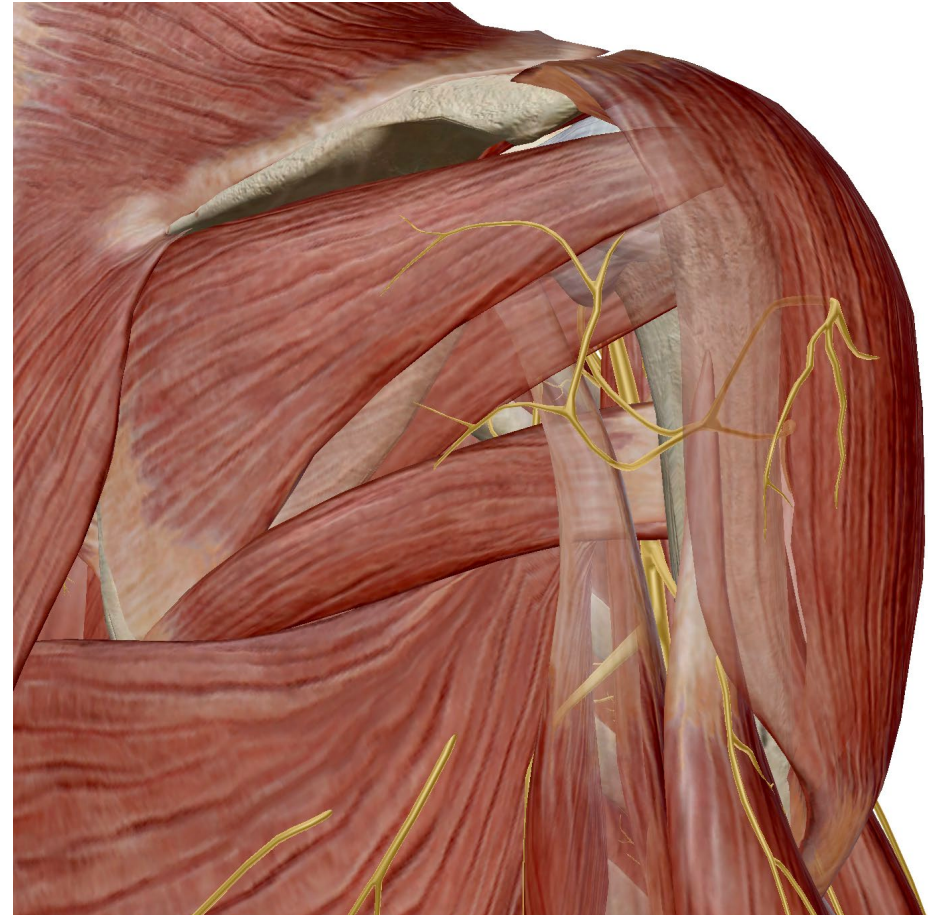
Arises from the posterior cord of the brachial plexus

Posterior branch

Innervates teres minor and posterior deltoid

Pierces deep fascia and becomes superior cutaneous nerve of arm

Articulating branch enters shoulder joint below subscapularis



Axillary Nerve Block

Transducer placed in sagittal orientation between posterolateral corner of the acromion and axillary fold

Major landmarks:

- Humerus

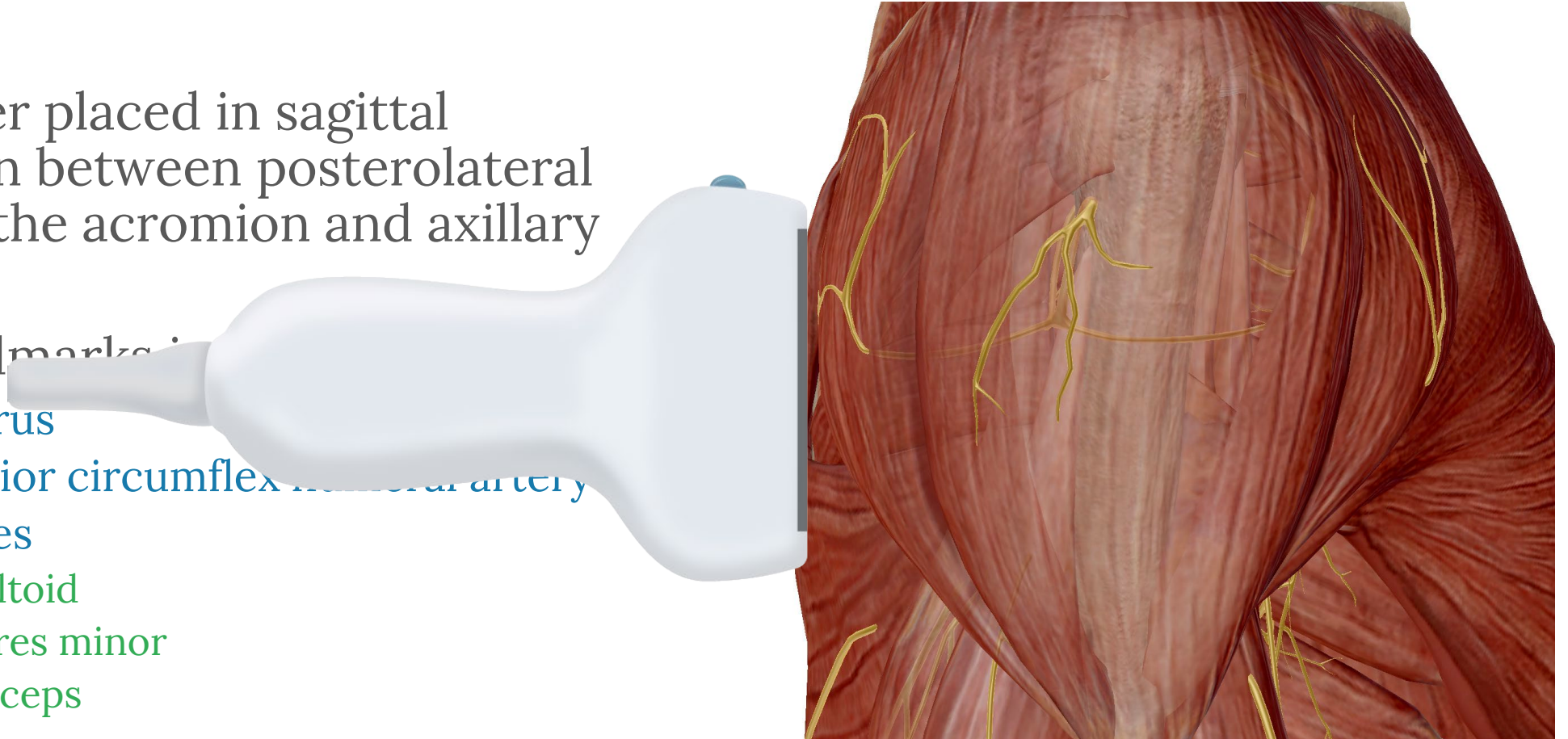
- Posterior circumflex humeral artery

- Muscles

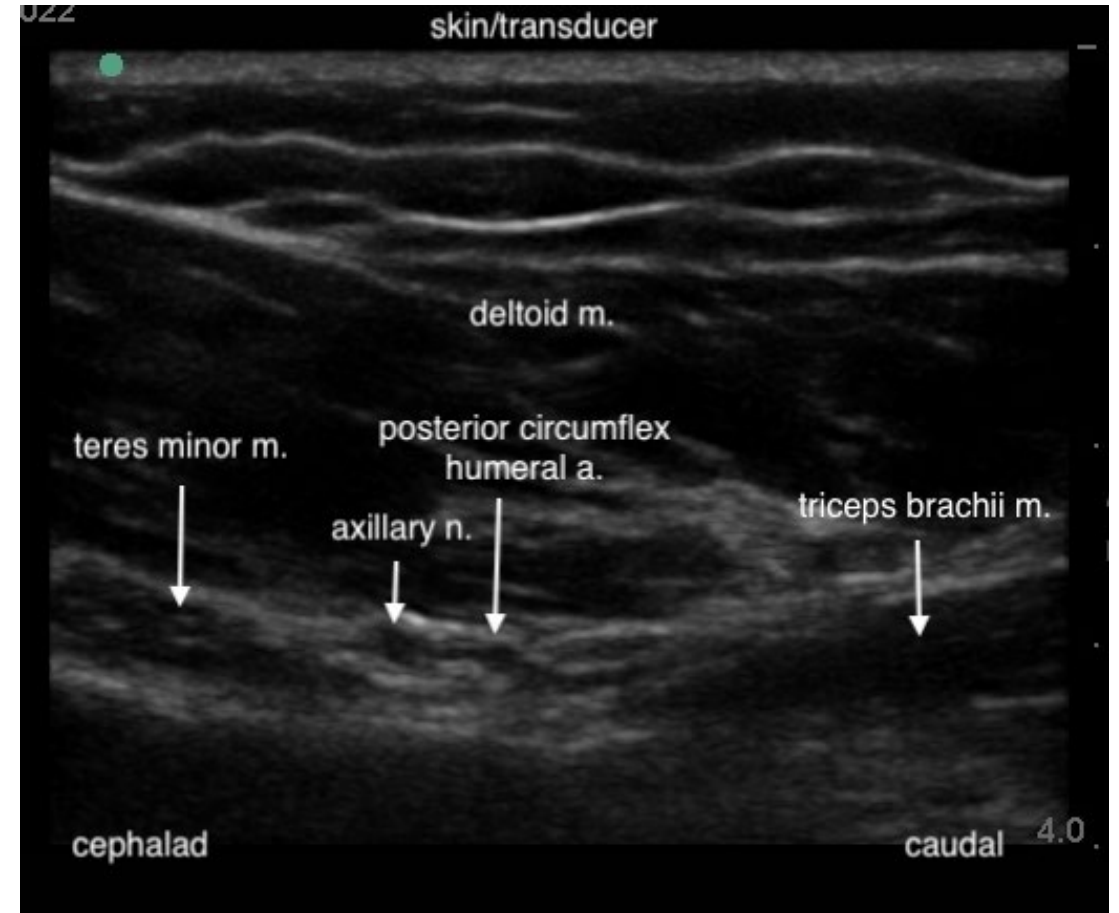
 - Deltoid

 - Teres minor

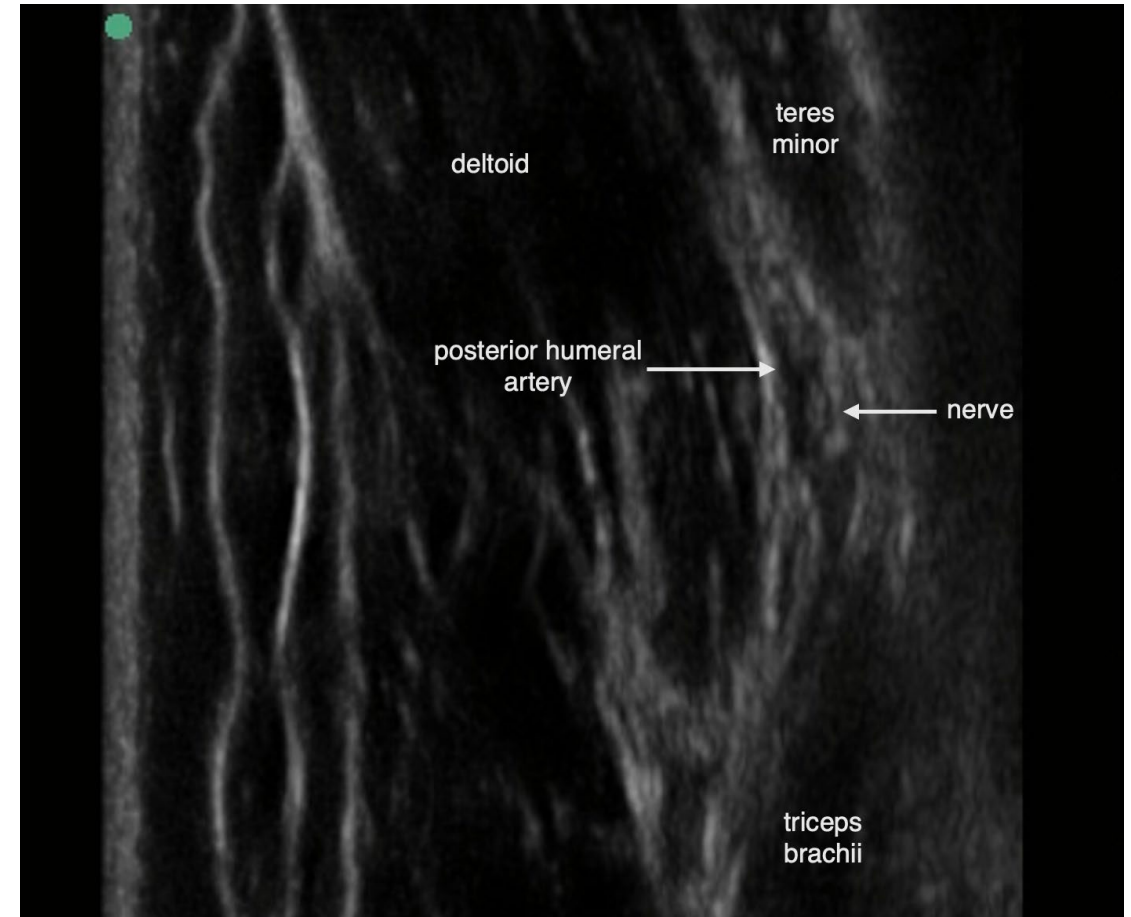
 - Triceps



Axillary Nerve Block



Axillary Nerve Block



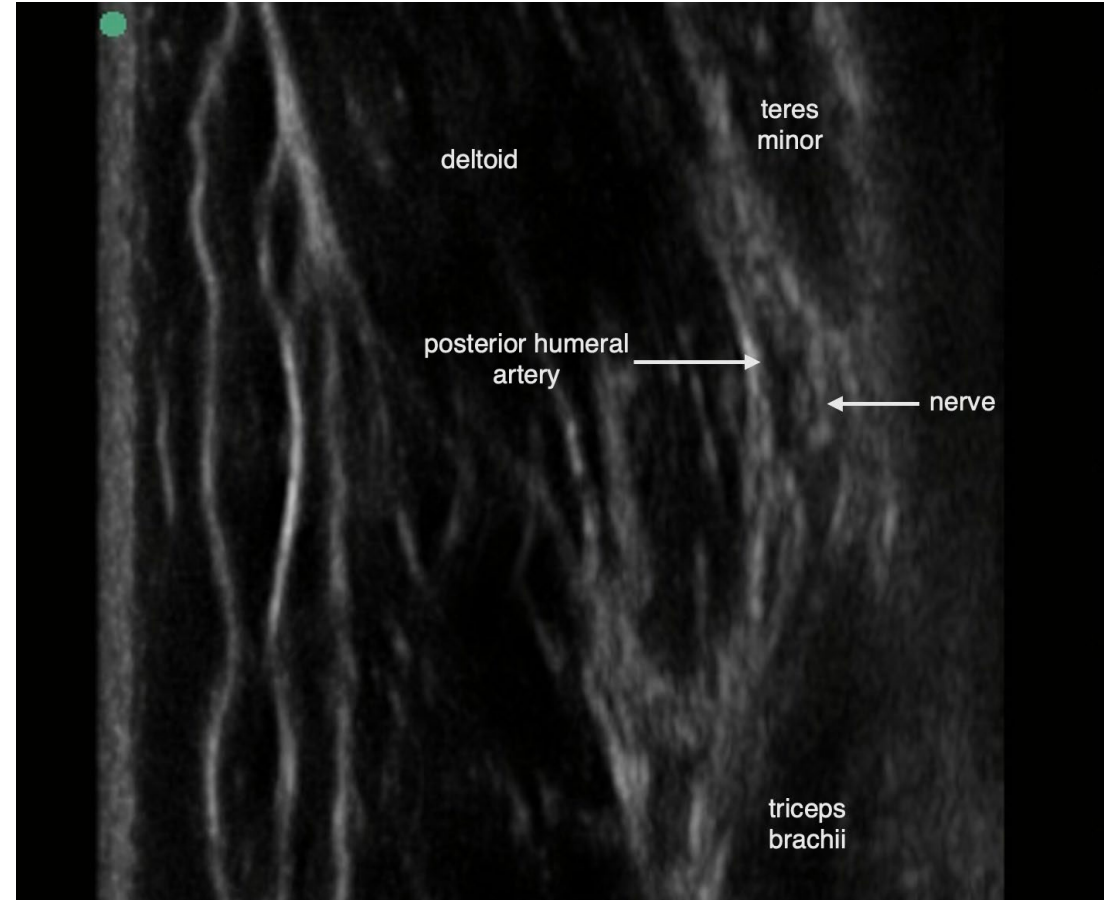
Axillary Nerve Block

Needle is inserted in-plane
cephalad to caudad

Must pierce fascia that contains
artery and nerve

Following negative aspiration, 10
mL of local anesthetic is injected

Be sure to avoid the posterior
circumflex humeral artery





Demonstration

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Thank you!

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