

OSCE Regional Ultrasound Review

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- Each OSCE scenario will address one of the following skills:
 - Communications and Professionalism
 - Technical Skills
 - Application of Ultrasonography
- This study guide will focus on preparation for the “Application of Ultrasonography” scenarios
 - Using an ultrasound probe on a simulated patient, the examinee will be expected to produce the appropriate image, describe simulated needle placement, and identify all pertinent anatomy on a screenshot of the image you produced.
 - The examinee operates the ultrasound probe & can ask the examiner to adjust depth/gain. They then ask the examiner to “freeze” the image. This image is what will be used during questioning by the examiner.
 - The following procedures may be tested
 - Vascular Cannulation
 - Internal Jugular Vein
 - Cubital Fossa Vessels
 - Radial Artery
 - Femoral Vessels
 - Nerve Blocks
 - Femoral
 - Adductor Canal (Saphenous)
 - Popliteal
 - Transversus Abdominis Plane (TAP)
 - Interscalene

- Supraclavicular
 - This guide will review proper patient positioning, appropriate ultrasound probe placement, and pertinent ultrasound image anatomy for the above nerve blocks.
- This guide, including the images within, is to be used for non-profit educational purposes only.

FEMORAL NERVE BLOCK

Patient Positioning

- Supine with slight external rotation of hip

Probe Placement

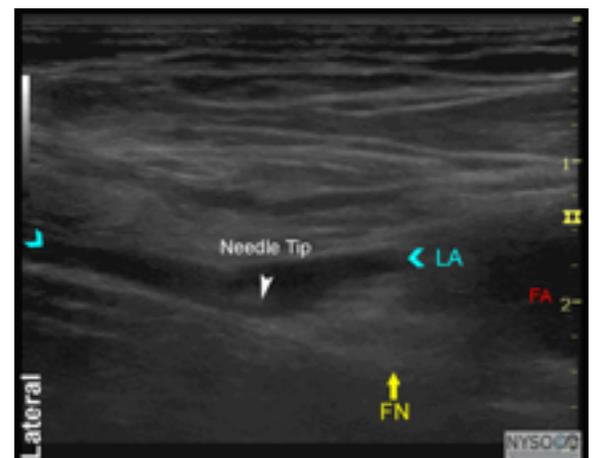
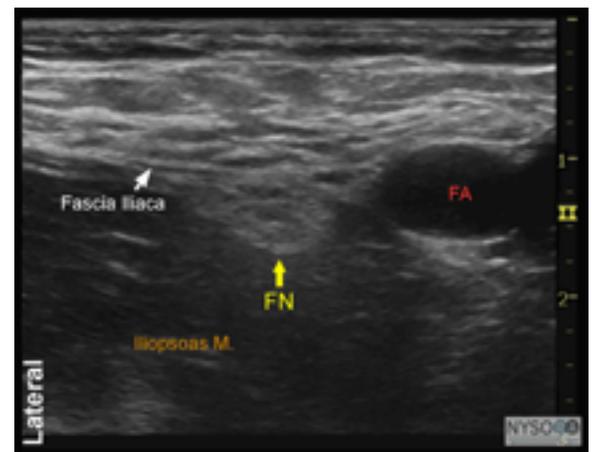
- Transverse, in the inguinal crease

Obtaining Image/Pertinent Anatomy

- Slide probe medially or laterally until pulsating femoral artery is identified
- Remember mnemonic
 - NAVL (Lateral to medial)
- Identify the following structures
 - Femoral nerve
 - Femoral artery
 - Femoral vein
 - Fascia iliaca
 - Iliopsoas muscle

Needle Placement

- In-Plane (lateral to medial)
- Superficial or deep approach acceptable
 - Visualize local anesthetic spread around nerve in area deep to fascia iliaca and superficial to iliopsoas muscle



Adductor Canal (Saphenous) Block

Patient Positioning

- Supine with knee slightly flexed and leg externally rotated (frog leg position)

Probe Placement

- Transverse, medial aspect of mid thigh



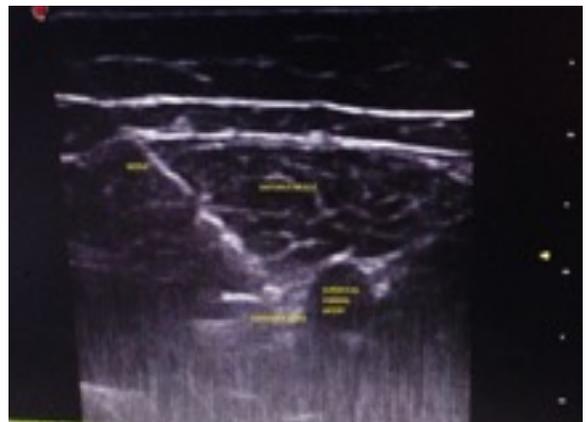
Obtaining Image/Pertinent anatomy

- Find femur, slide probe medially until the pulsating femoral artery is visualized within the canal
- The nerve is not always well visualized
- Identify the following structures
 - Femur
 - Superficial femoral artery
 - Sartorius (medial) and vastus medialis (lateral) muscles



Needle Placement

- In plane (lateral to medial)
- Visualize local anesthetic spread deep to Sartorius and around the femoral artery. Often see the artery being “pushed away” by local anesthetic



Popliteal Block

Patient Positioning

- Supine with leg rest/support, elevating the knee enough to place US probe
- Can also be performed while patient is in the prone position

Probe Placement

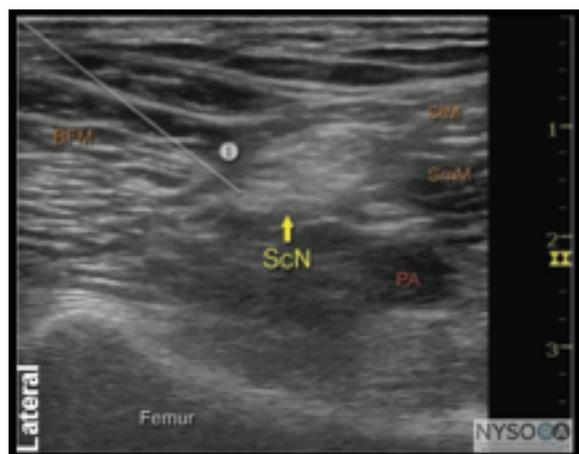
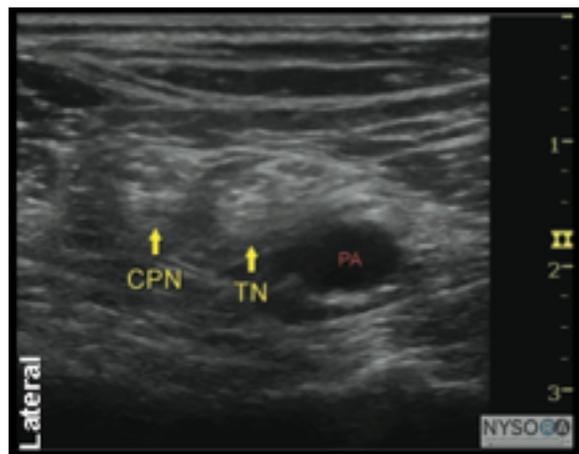
- Transverse in popliteal crease between tendons of hamstring muscles, then approximately 5cm cephalad of crease

Obtaining Image/Pertinent anatomy

- Identify popliteal artery at a depth of approximately 3-4cm
- Lateral and superficial to artery should be the tibial and common peroneal nerves (CPN is most lateral)
- Slide the probe proximal, identifying where the two nerves join to form the sciatic nerve
- Identify the following structures:
 - Popliteal artery
 - Common peroneal nerve
 - Tibial nerve
 - Sciatic nerve
 - Biceps femoris (lateral)
 - Semitendinosus and semimembranosus muscles (medial)

Needle Placement

- In plane (lateral to medial)
- Visualize local anesthetic spread proximally and distally, separating the two nerves



Transversus Abdominis Plane (TAP) Block

Patient Positioning

- Supine, arm extended over head

Probe Placement

- Transverse on the abdomen
- Anterior axillary line, between iliac crest and costal margin



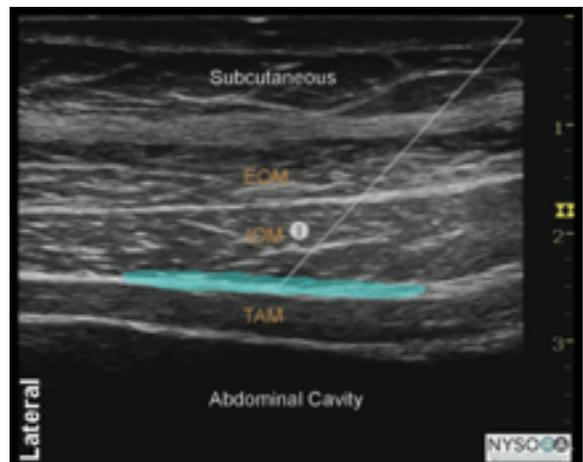
Obtaining Image/Pertinent anatomy

- Locate the three muscle layers (slight movements cephalad or caudad may assist in identifying these layers)
- Identify the following structures:
 - Subcutaneous tissue
 - External Oblique muscle
 - Internal Oblique muscle
 - Transverse Abdominal muscle
 - Peritoneum



Needle Placement

- In plane (medial to lateral)
- Visualize local spread between the internal oblique and the transversus planes



Interscalene Block

Patient Positioning

- Sitting with HOB 30 degrees with neck turned away from block side

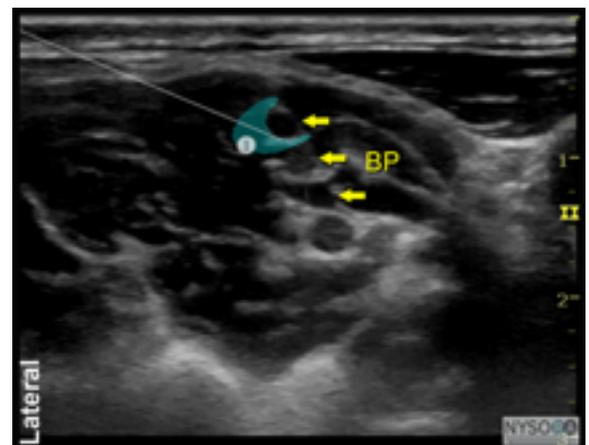
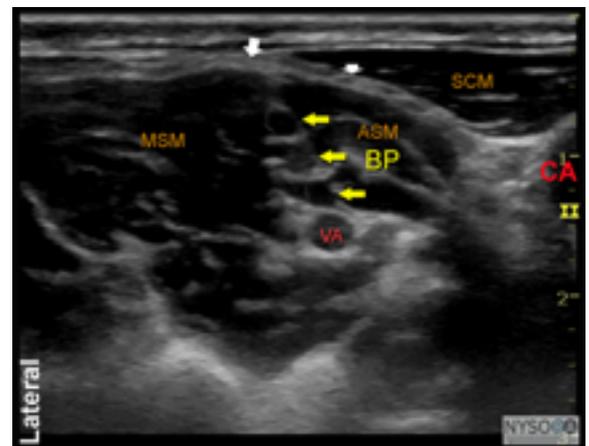
Probe Placement

- Transverse on neck, 3-4 cm cephalad to clavicle, just lateral to SCM



Obtaining Image/Pertinent anatomy

- Start just cephalad to clavicle at the midclavicular line. Visualize subclavian artery and divisions of the brachial plexus
- Trace the brachial plexus cephalad, to the level of cricoid cartilage, approximately 2-3cm above clavicle
- Classic traffic light view between the bellies of the anterior and middle scalene muscles
- Identify the following structures:
 - C5, C6, C7 nerve roots
 - Sternocleidomastoid, Anterior Scalene, and Middle Scalene muscles
 - Carotid artery, internal jugular vein (if visualized medially)
 - C6 transverse process



Needle Placement

- In plane (lateral to medial)
- Visualize local anesthetic spread between the C5 and C6 nerve roots for shoulder surgery

Supraclavicular Block

Patient Positioning

- Semisitting position with head facing away from block side

Probe Placement

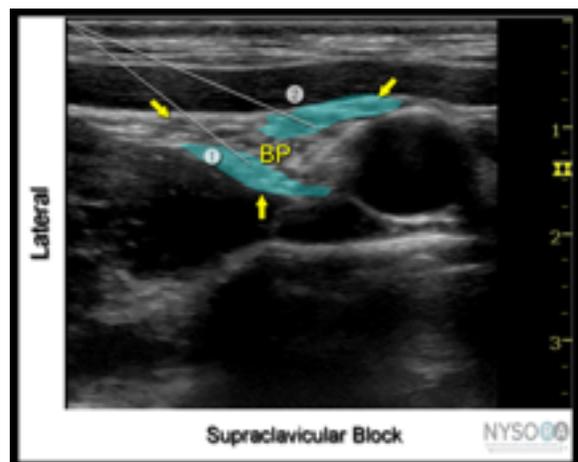
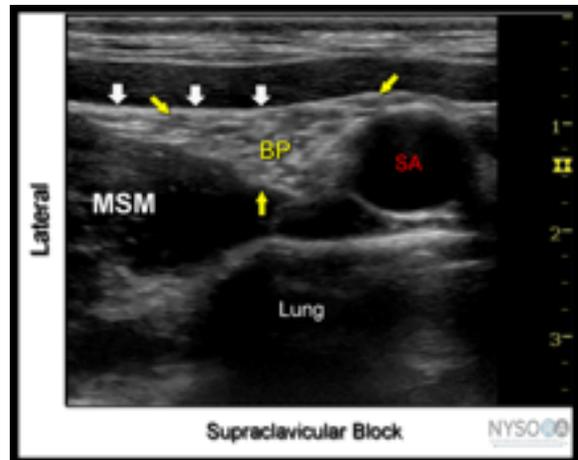
- Transverse, just cephalad to clavicle at the midclavicular line

Obtaining Image/Pertinent anatomy

- Find the “bundle of grapes” just lateral and superficial to the pulsating subclavian artery
- Identify the following structures:
 - Brachial Plexus
 - Middle scalene muscle
 - Subclavian artery
 - 1st rib
 - Lung/pleura

Needle Placement

- In-plane (lateral to medial)
- Visualize adequate spread surrounding the brachial plexus.
- Do not forget to inject local anesthetic in the “corner pocket” (area between subclavian artery, 1st rib, and brachial plexus) if C8/ulnar blockade is indicated



References

1. "Ultrasound Guided Techniques Archives." *NYSORA The New York School of Regional Anesthesia*. Web.
2. "ASA 2016 Ultrasound Guided Adductor Canal Block (blockade) Femoral Nerve Block (blockade)". *Youtube*, 12 Oct. 2016. Web.
3. "Ultrasound Guided Adductor Canal Block for Benign Tumor resection...by Dr. Tugce Yeniocak." *ESRA Academy - Official ELearning Portal of ESRA (European Society of Regional Anaesthesia & Pain Therapy)*. 8 Sept. 2016. Web.

