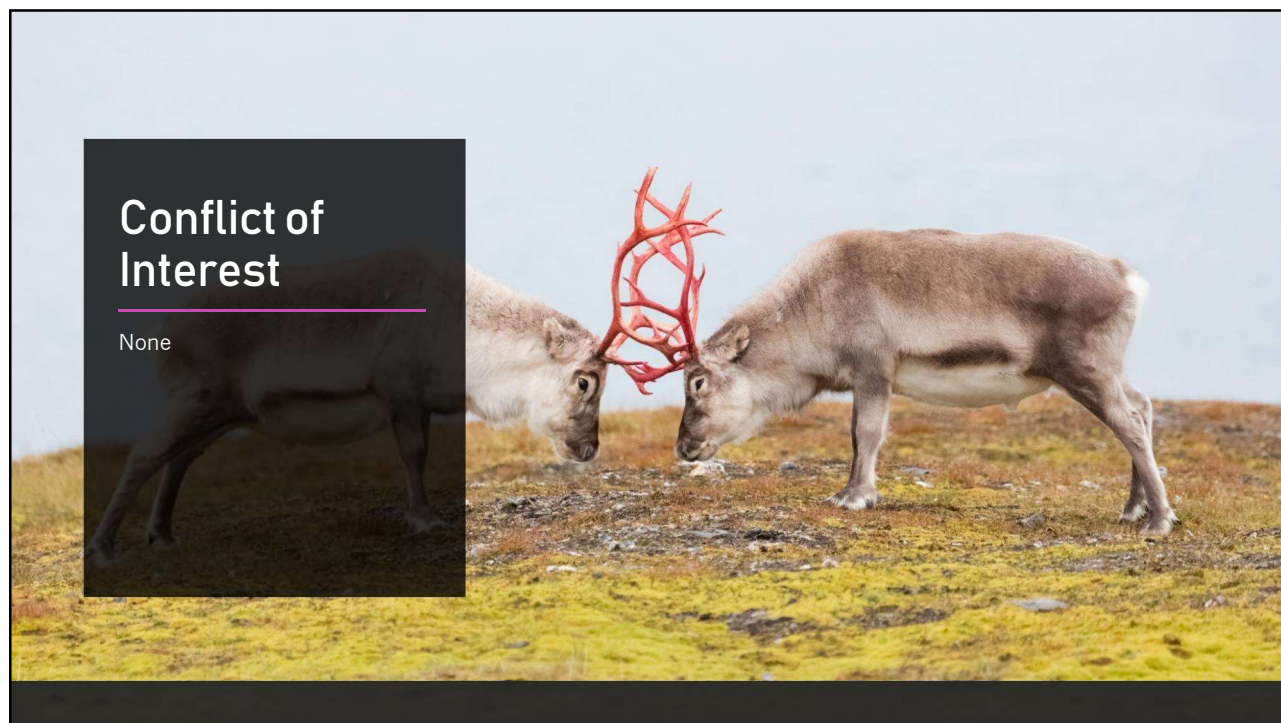
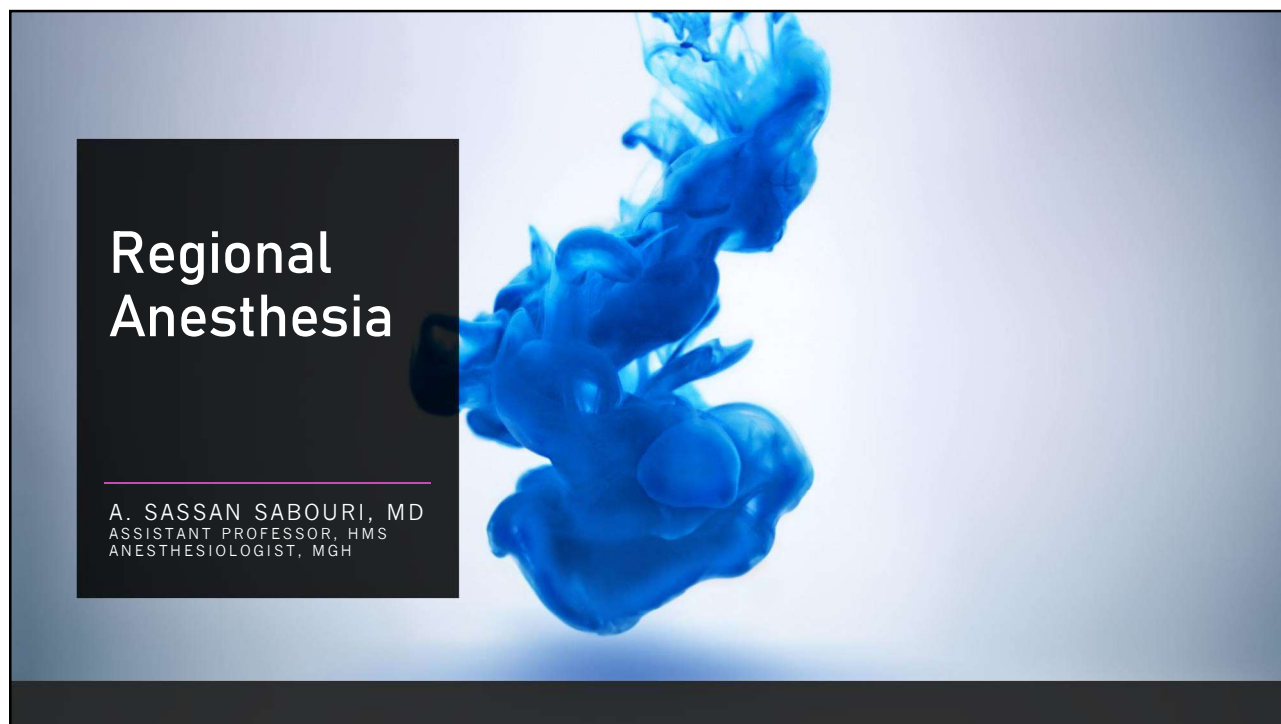




Objectives



(1) review a brief history of regional anesthesia



(2) review of pertinent anatomy



(3) describe the ultrasound images of upper and lower extremity



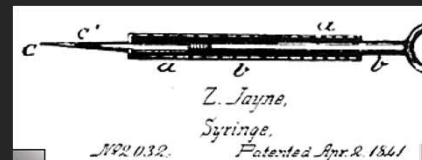
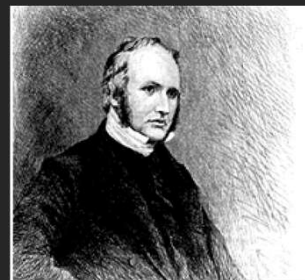
(4) compare the effectiveness of regional anesthesia approaches and techniques

Brief History of Regional Anesthesia

French veterinary surgeon Charles Gabriel Pravaz and Scottish doctor **Alexander Wood** (1841-1855)
Invention of the hollow needle

Austrian ophthalmologist Carl Koller (1884) : first regional anesthesia- Cocaine ophthalmic administration

American Surgeon Stewart **Halsted**, (1885): first brachial plexus block under direct vision.

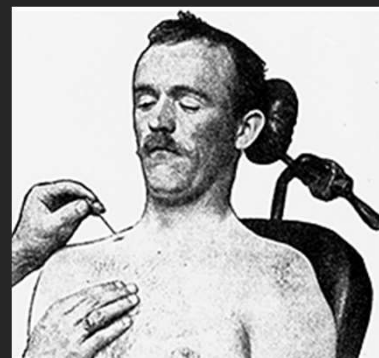


Brief History of Regional Anesthesia-Cont.

Diedrich **Kulenkampff** (1911): First percutaneous Supraclavicular brachial plexus block.

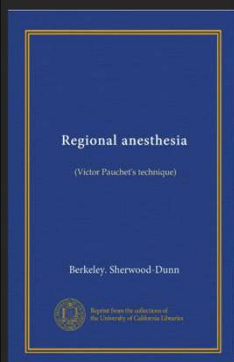
George Hirschel (1911) : first Axillary block

Patrick's Modified Kulenkampff technique (1940)



Patrick J: The technique of brachial plexus block anesthesia. Br J Surg 1940;27:734-739.

Brief History of Regional Anesthesia-Cont



← Victor Pauchet –
Amines, France 1869-
1936

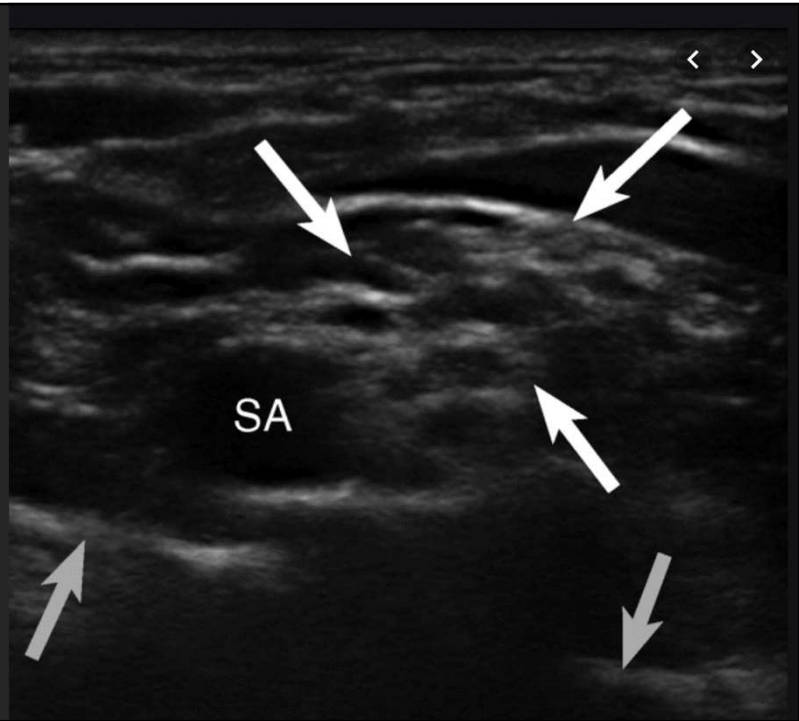
Gaston Labat-
Rochester, Minnesota
1843-1908 →



Ultrasound-Guided Regional Anesthesia (UGRA)

La Grange and colleagues (1978)- Doppler Ultrasound

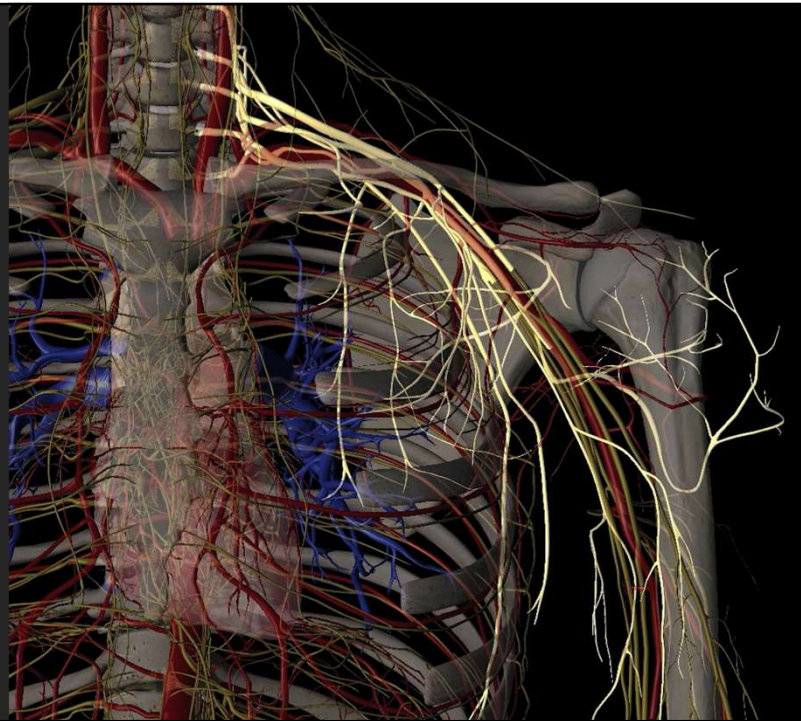
Kapral S and colleagues at the University of Vienna in the mid-1990s



Upper Limb Regional Anesthesia

Innervation of Upper Limb (UL)

- 1- Brachial Plexus (BP)
- 2- T2 Intercostal (Intercostobrachial N.)
- 3- Supraclavicular N (Superficial Cervical Plexus (C3-4))



Brachial Plexus

MC: Musculocutaneous N.

M: Median N.

U: Ulnar N.

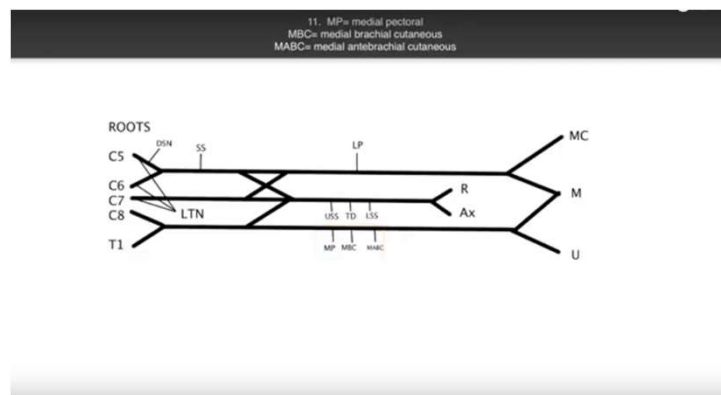
R: Radial N.

Ax: Axillary N.

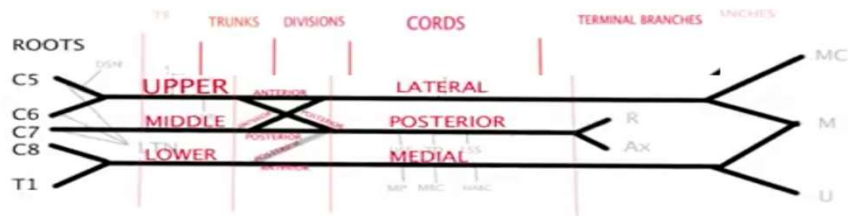
DSN: Dorsoscapular N.

L and USS: Subscapular N:

LP Lateral Pectoral



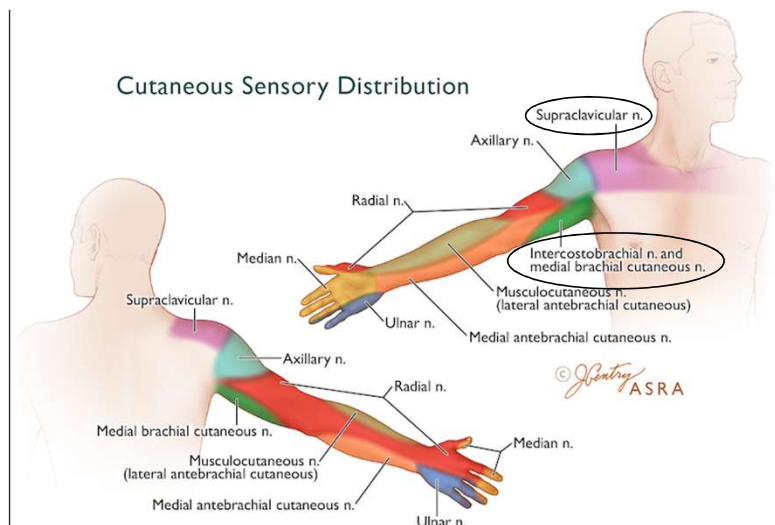
BP Partition



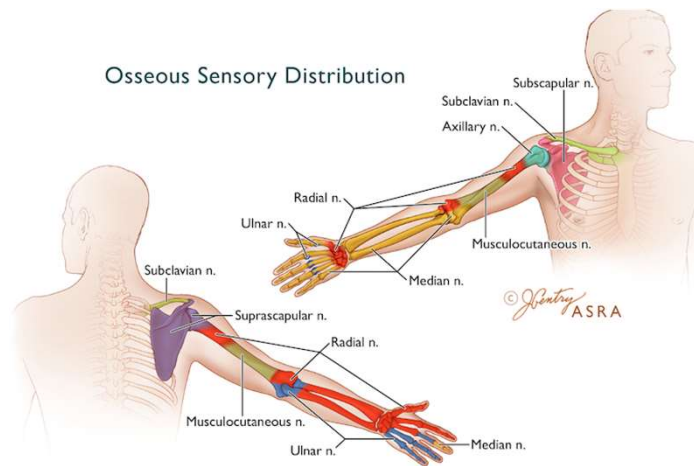
Real Teenagers Drink Cold Beer

UL Cutaneous Sensory innervation

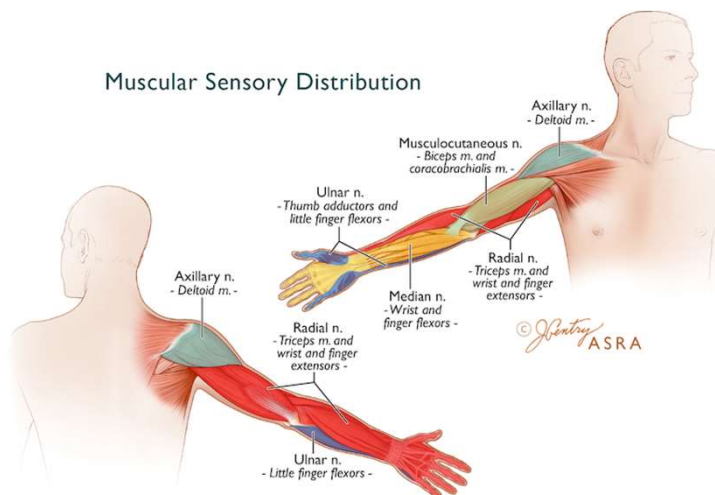
- considerable overlapping occurs between adjacent dermatomes.



UL Osseous Sensory Innervation



UL Muscular Innervation



Upper Extremity UGRA Approaches

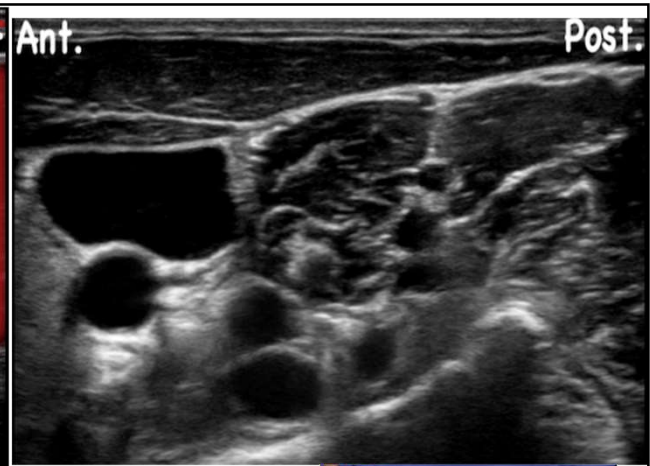
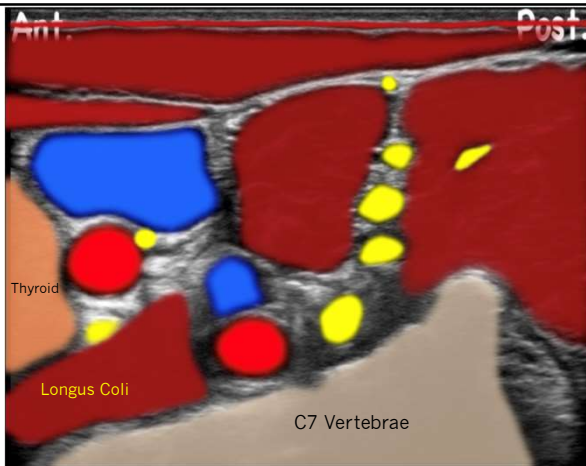
Interscalene Approach

Supraclavicular Approach

Infraclavicular Approach

Axillary Approach

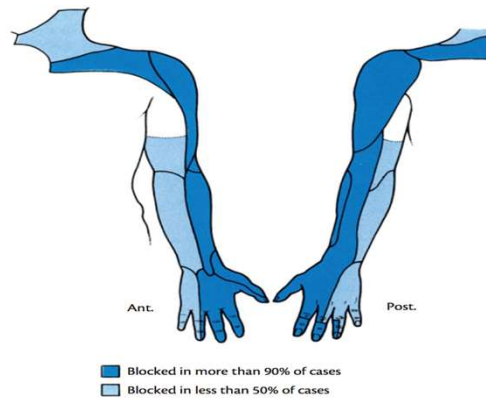
Terminal Peripheral Nerve Approaches



BP- Interscalene View



Block Distribution

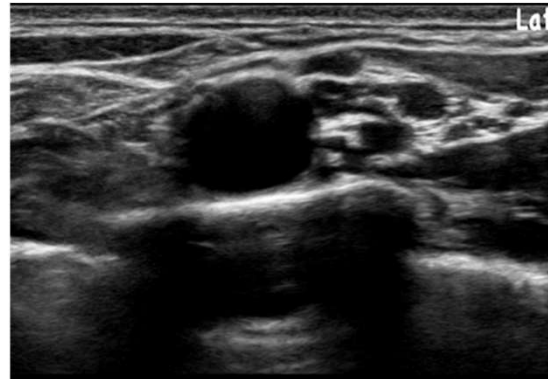
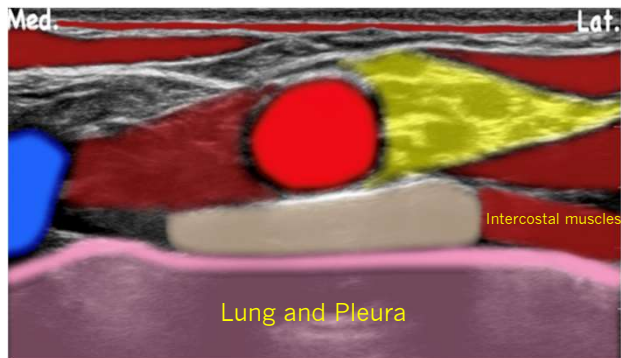


Choosing the Right Approach

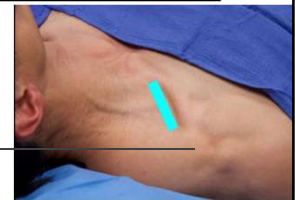
Surgery of the Shoulder, Clavicle, and Proximal Humerus

Include open rotator cuff surgery, open shoulder stabilization, and total shoulder replacement (TSR), Acromioplasty....

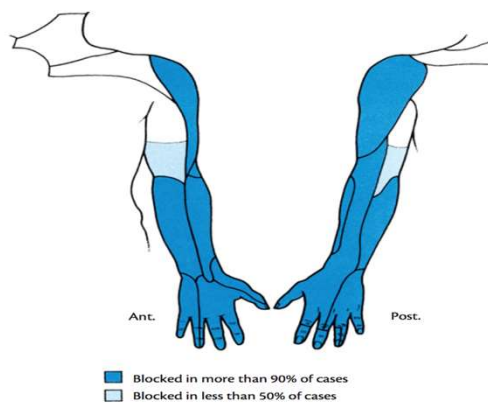


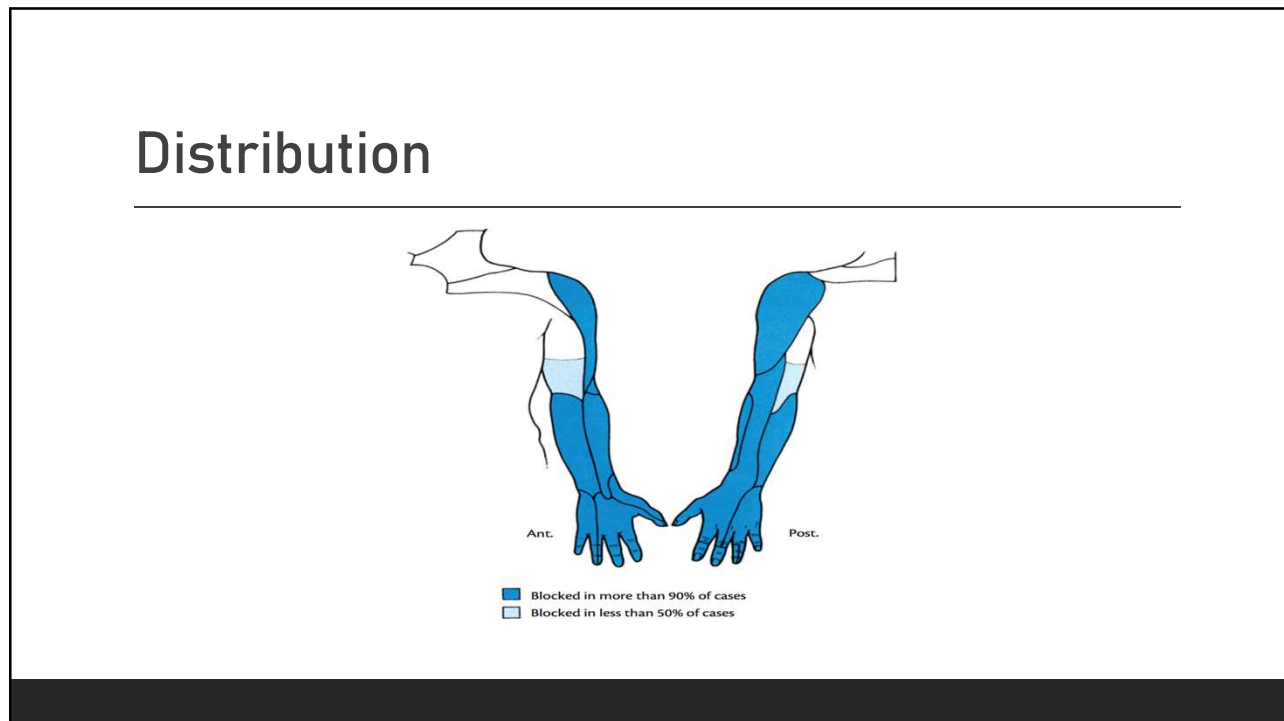
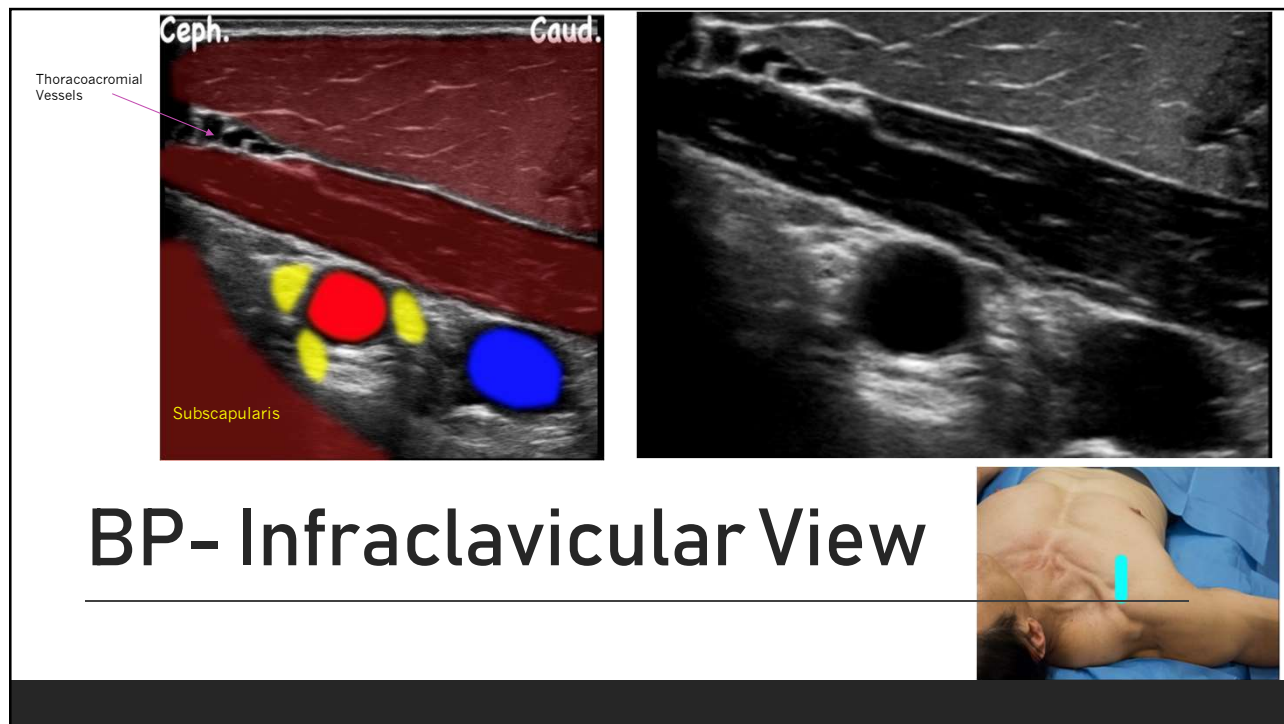


BP- Supraclavicular View

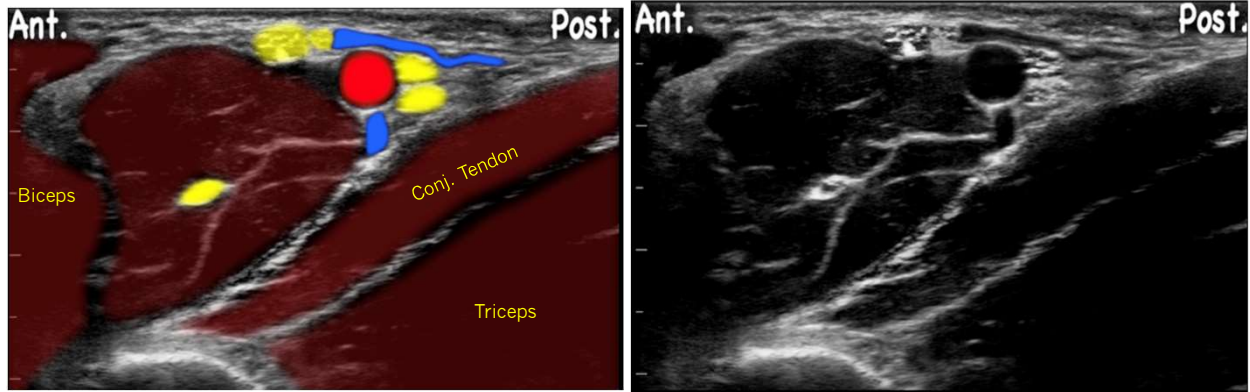


Distribution

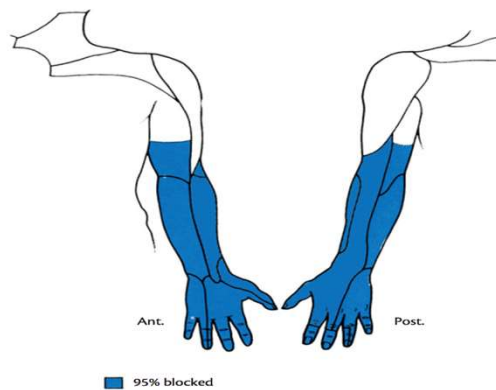




BP- Axillary View



Distribution



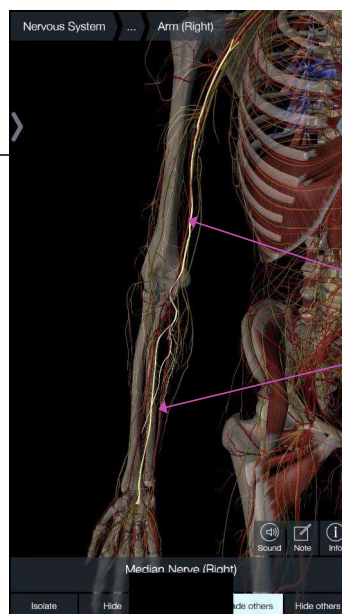
Choosing the Right Approach

Surgical procedure involving the distal humerus, forearm, and hand



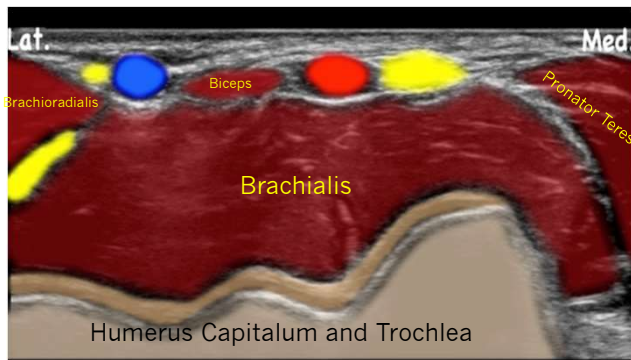
Median Nerve(MN)

(C5– 8, T1)

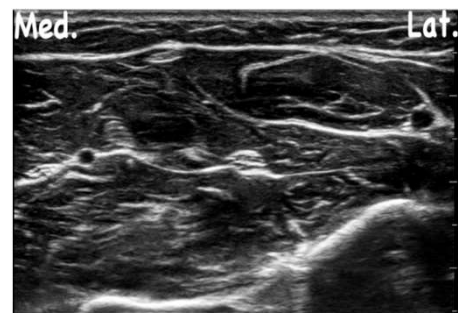
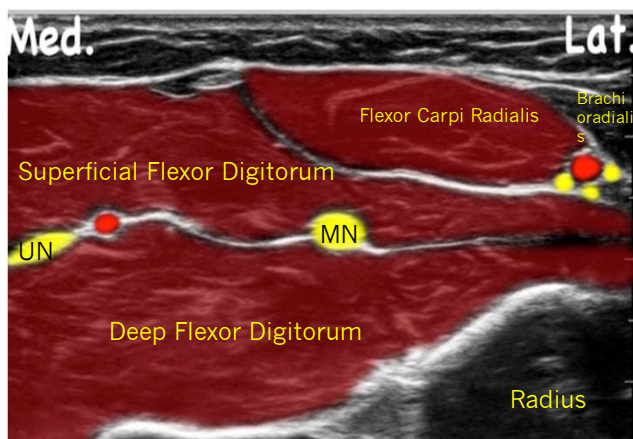


Approach

Median Nerve- Antecubital Fossa

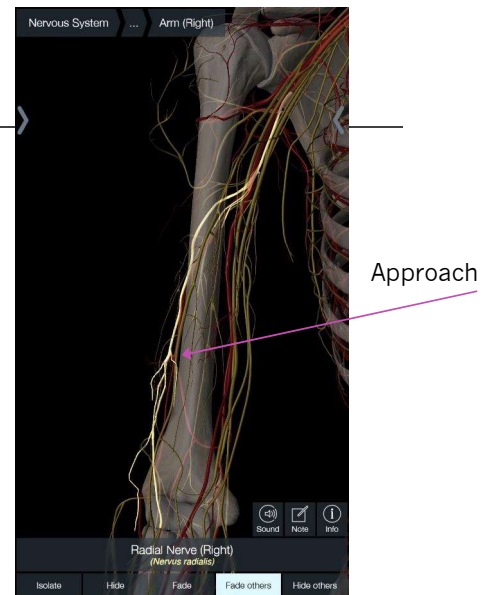


Median Nerve – Mid Forearm

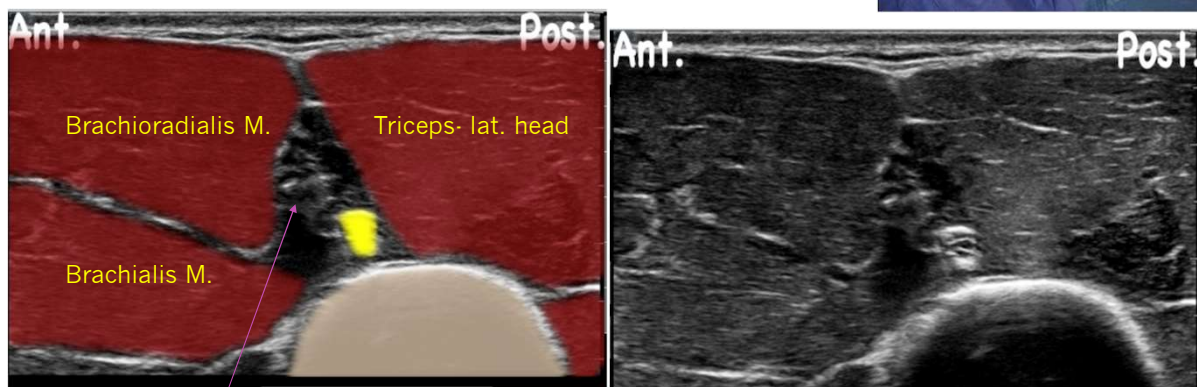


Radial Nerve(RN)

(C5-8. T1)

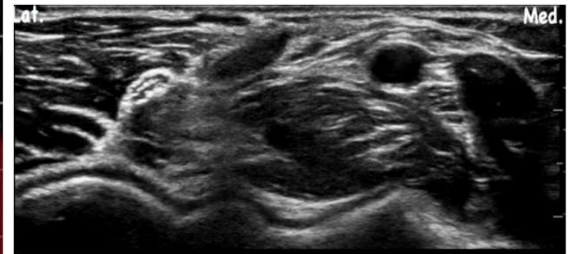
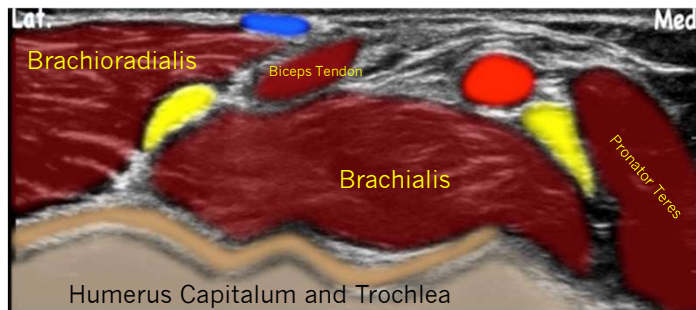


Radial Nerve- Distal Arm



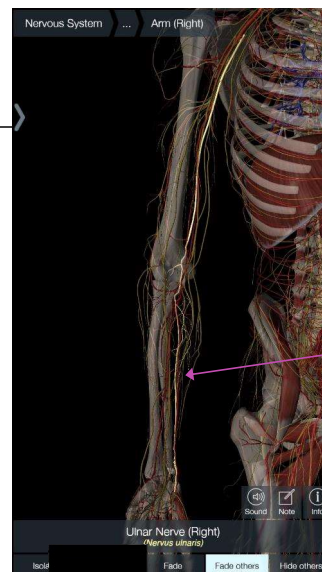
Deep Brachial Vessels

Radial Nerve -Antecubital Fossa



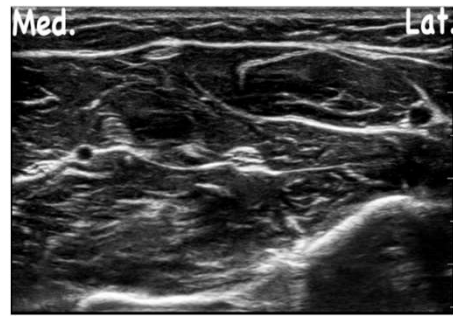
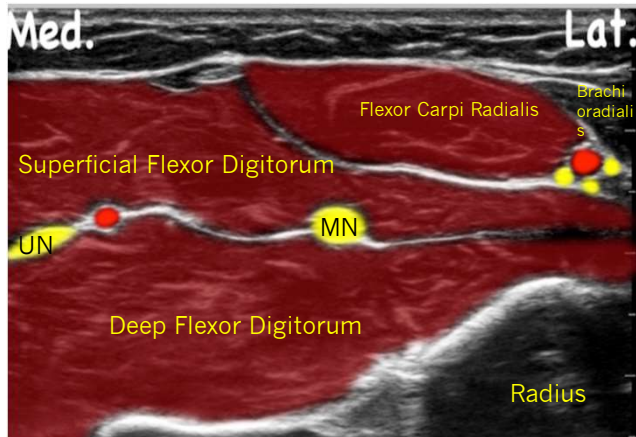
Ulnar Nerve(UN)

(C7, C8, T1)



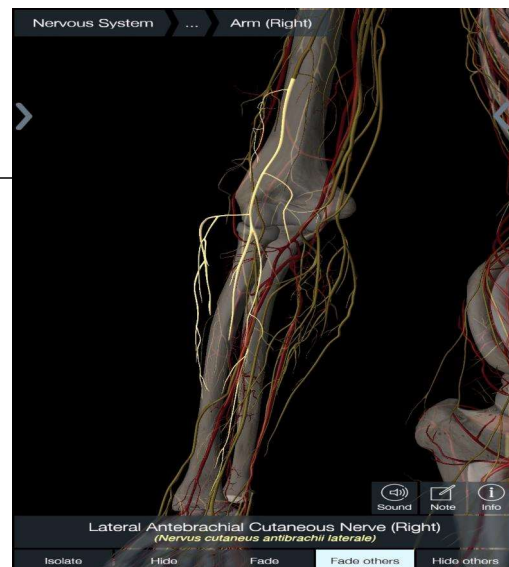
Approach

Ulnar Nerve – Mid Forearm

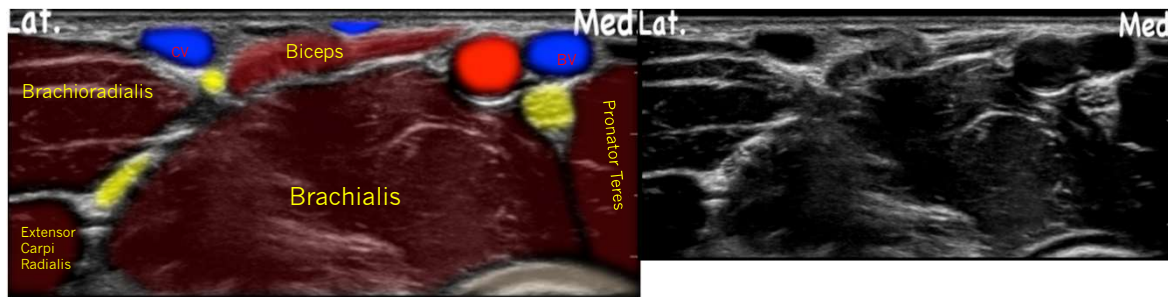
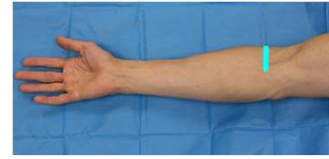


Lateral Cutaneous Nerve of the Forearm

C5- C7

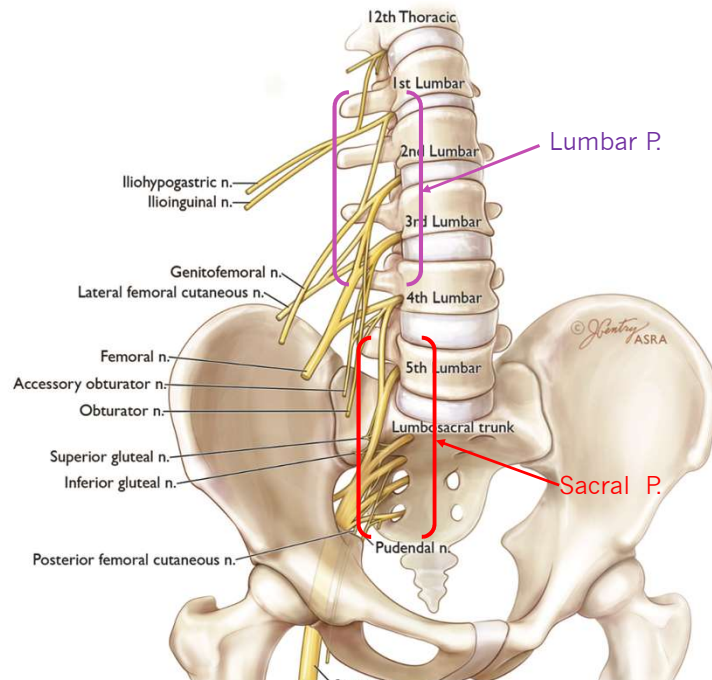


Lateral Cutaneous Nerve - Forearm



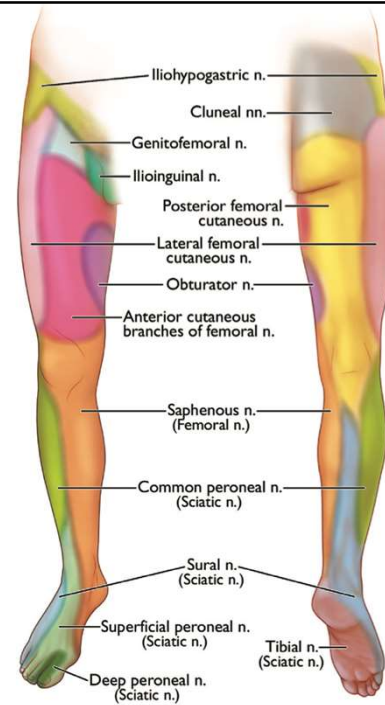
Lower Limb Regional Anesthesia

Diagram of lumbar and sacral plexus

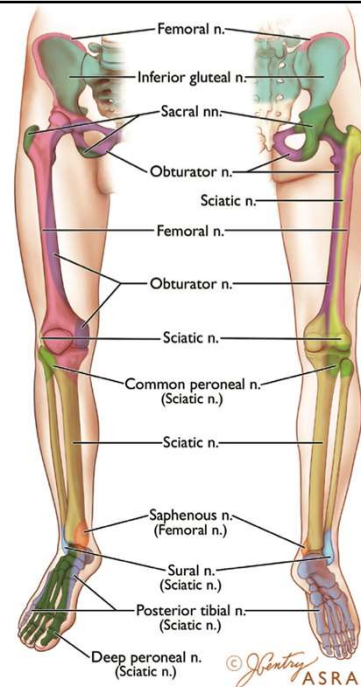


Cutaneous Sensory Distribution

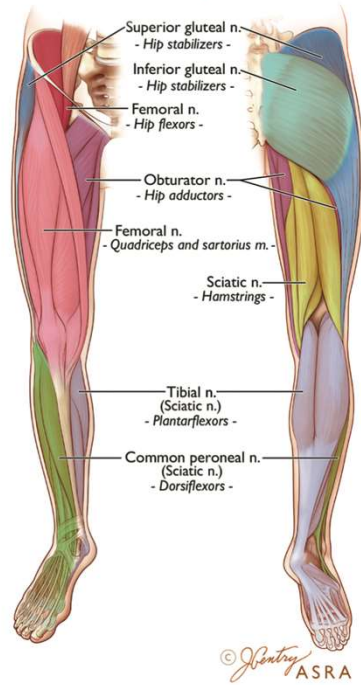
variable and overlapping



Osseous Sensory Distribution

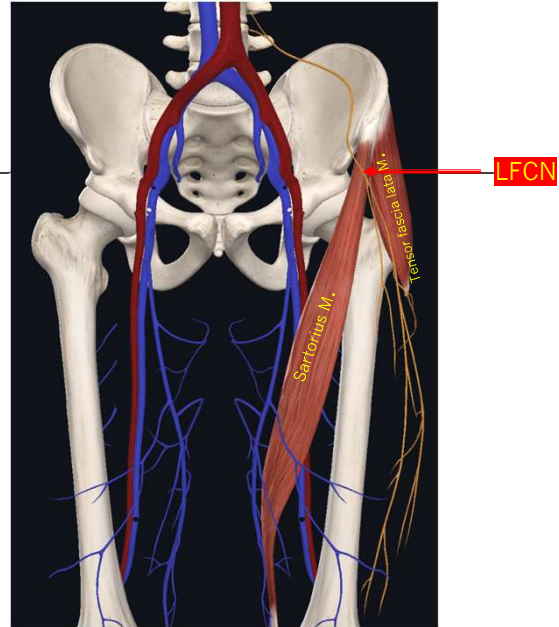


Muscular Sensory Distribution

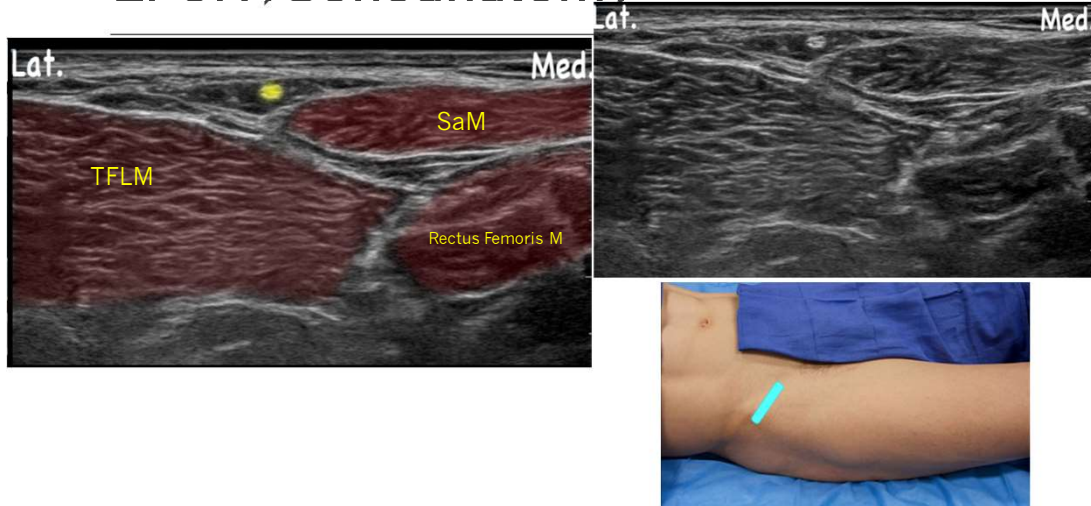


Lateral Femoral Cutaneous Nerve (LFCN)

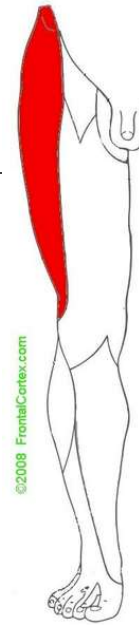
L2-L3



LFCN , Sonoanatomy

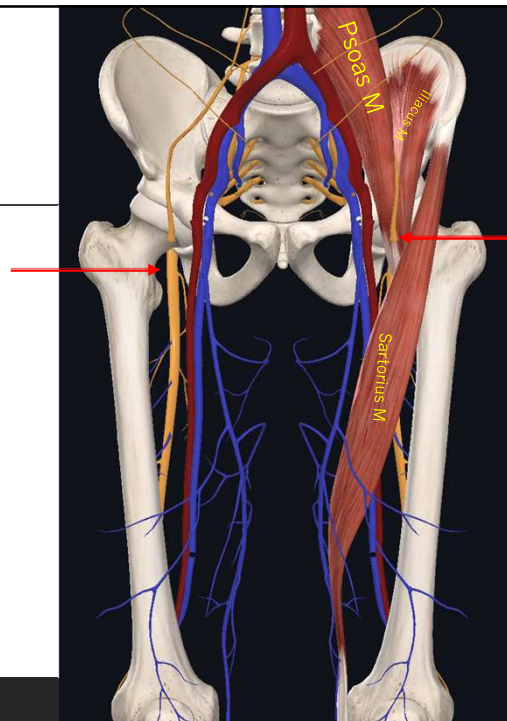


Coverage

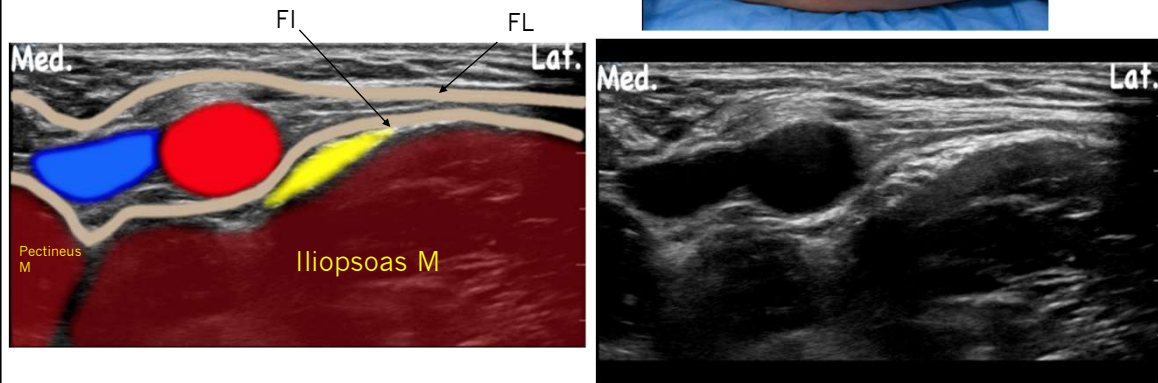


Femoral Nerve

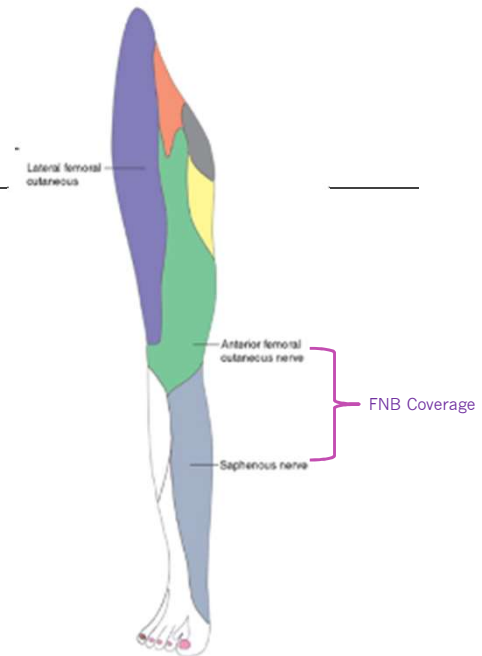
L2-4



FNB- US APPROACH

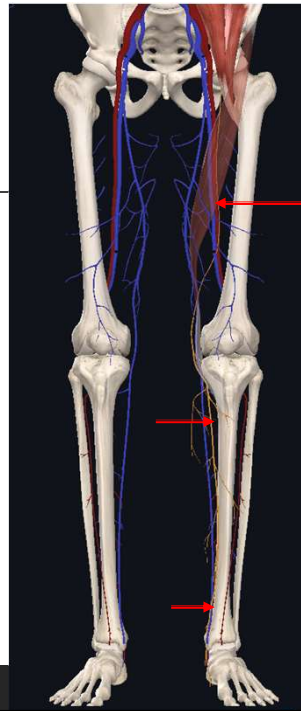


Coverage

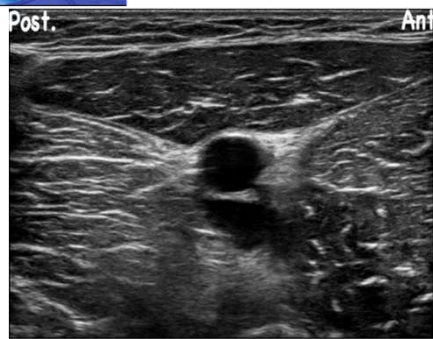
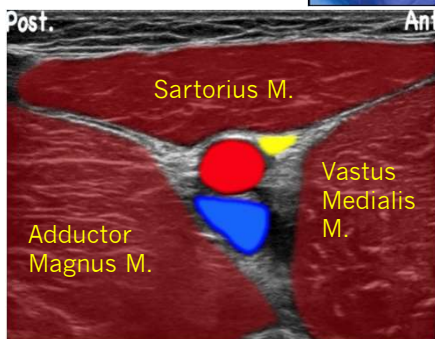


Saphenous N

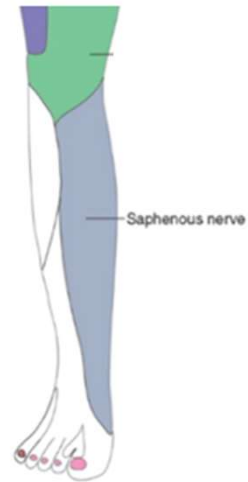
L3-L4



Adductor Canal approach to Saphenous Nerve



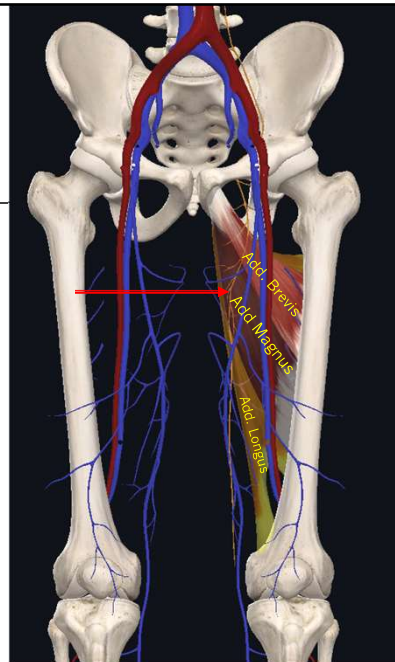
SaN, Converge



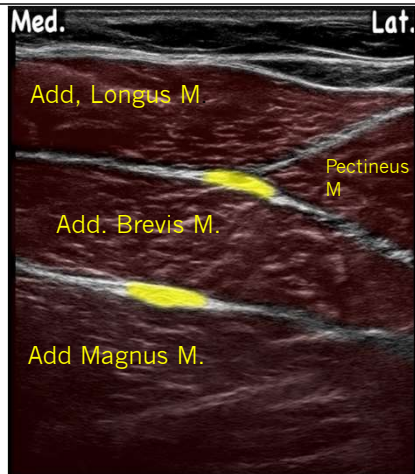
Hadzic's Peripheral Nerve Blocks and Anatomy for
Ultrasound-Guided Regional Anesthesia

Obturator Nerve

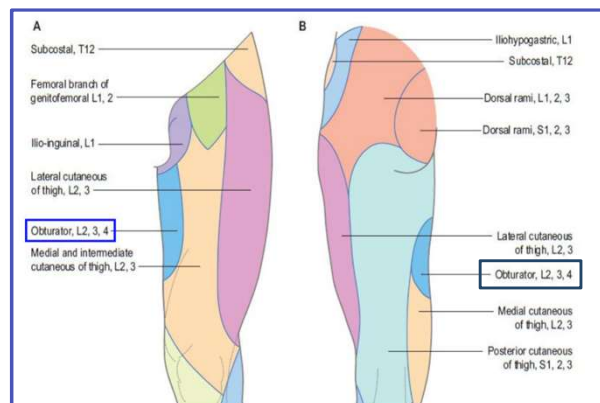
L2-L4



Obturator nerve block using UGRA

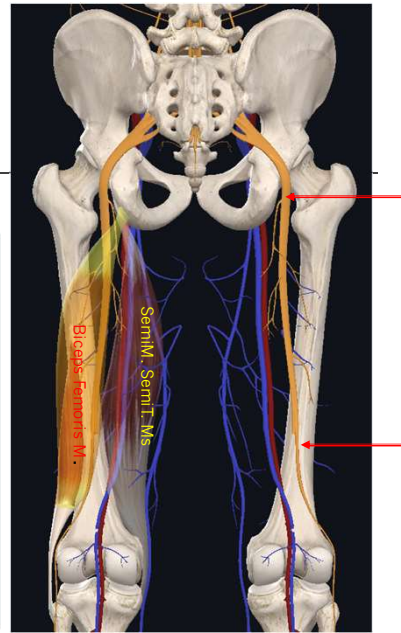


Sensory coverage



Sciatic Nerve

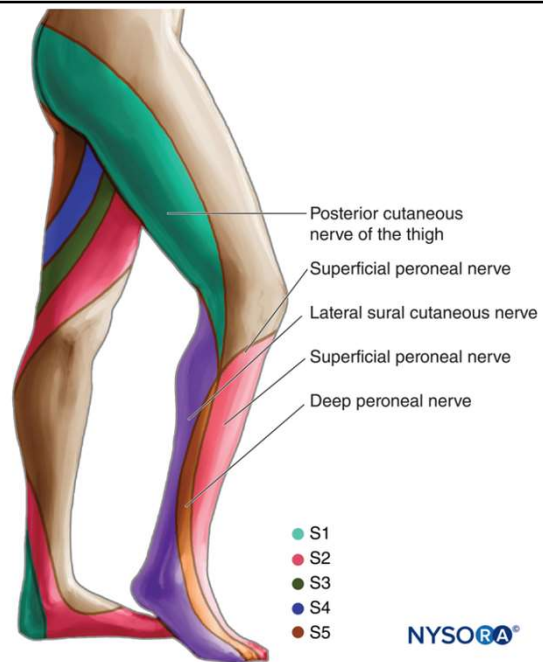
L4-S3



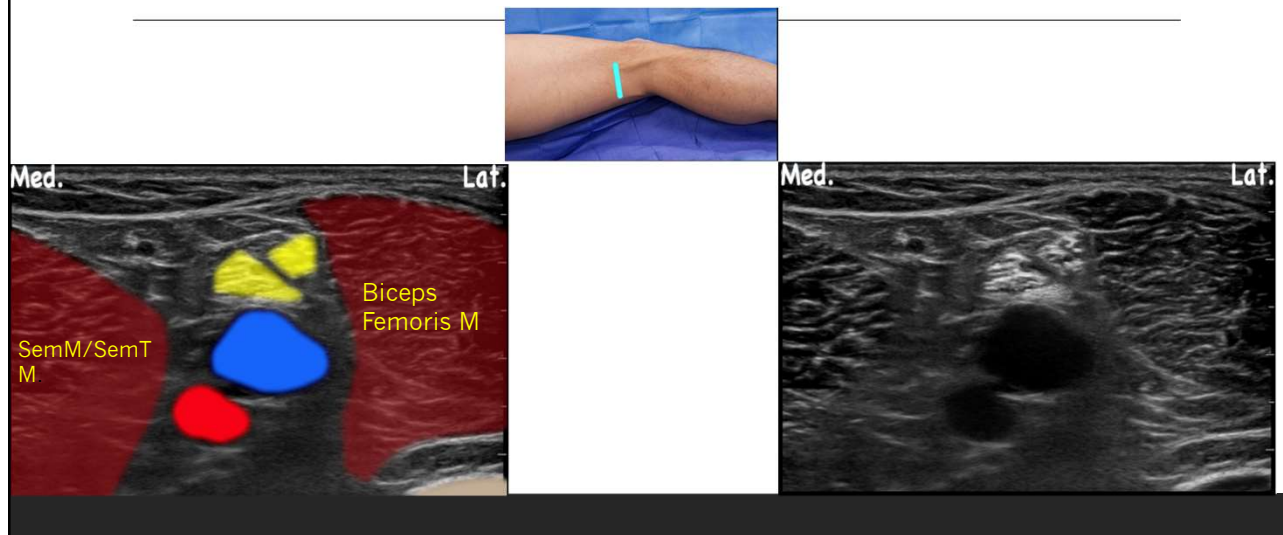
Subgluteal Sciatic Nerve Block (SSNB)_ Approach



SN-COVERAGE

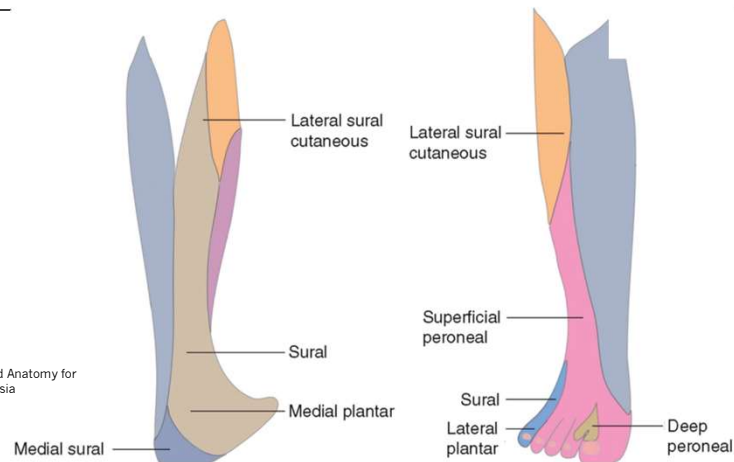


SNB at the level of Popliteal Fossa (PFB)

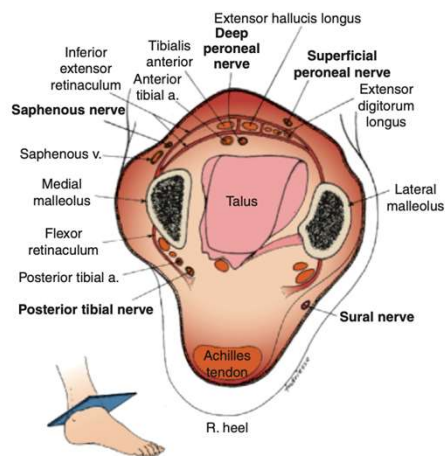


PFB, Coverage

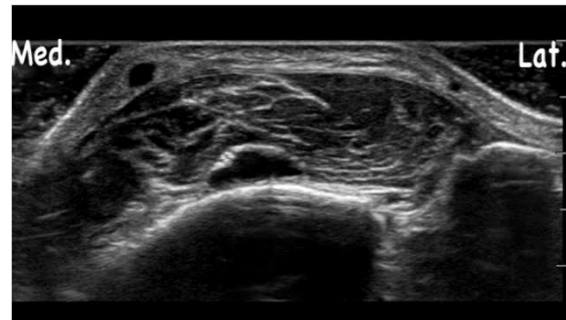
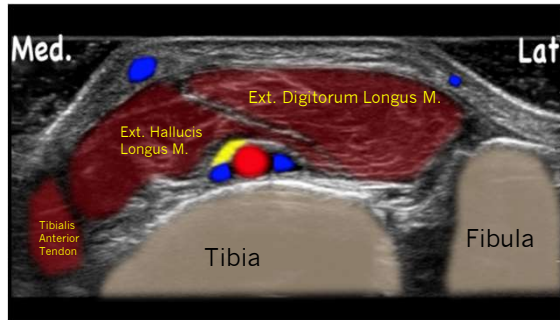
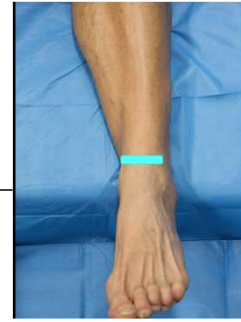
Hadzic's Peripheral Nerve Blocks and Anatomy for
Ultrasound-Guided Regional Anesthesia



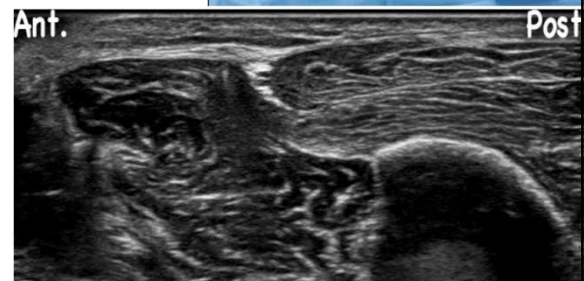
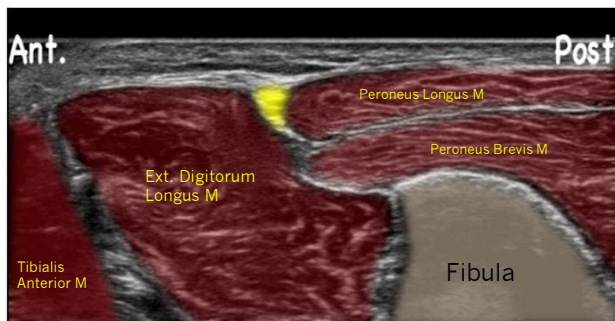
Anatomic structures at the level of the ankle.



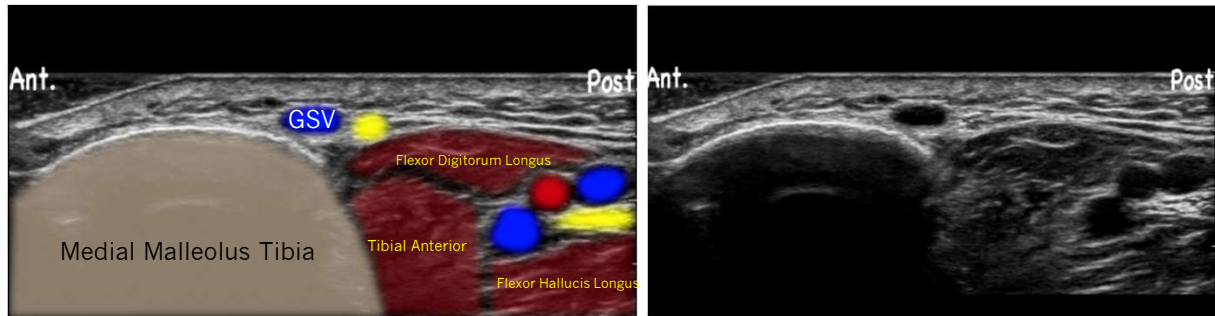
Ankle, Deep Peroneal Nerve



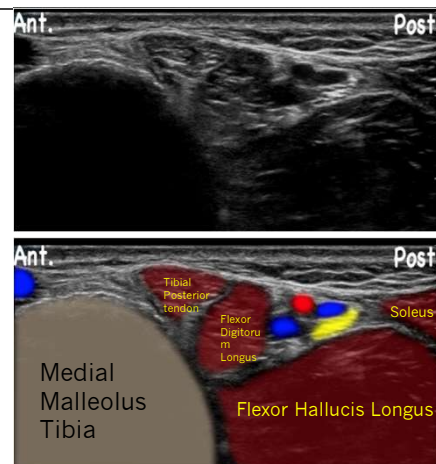
Ankle, Superficial Peroneal Nerve



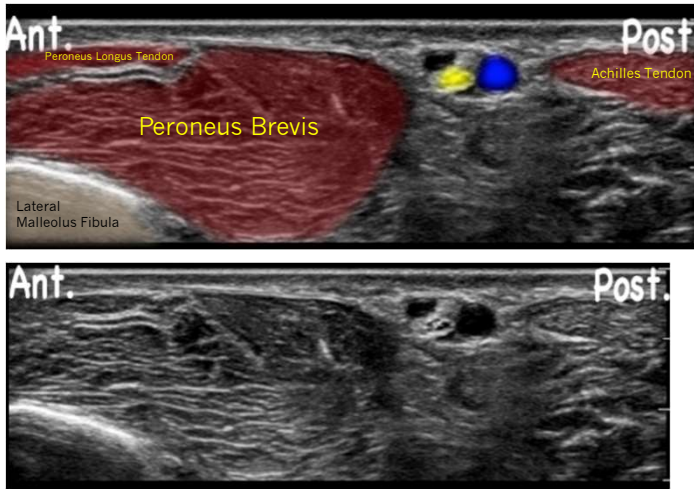
Ankle, Saphenous Nerve



Ankle, Posterior Tibial Nerve



Ankle, Sural Nerve



COVERAG



Conclusion

- 1- For any technique of regional anesthesia, safety and effectiveness are mandatory requirements
- 2- The need for customized anatomical literature to convey this knowledge is particularly significant for techniques as typical as blocks for the upper extremity.
- 3- This basic Knowledge enables clinicians to select the most appropriate regional anesthetic technique in any given situation.

Review of the ultrasound anatomy- Virtual Workshop March 15

- 1- BP @ the Interscalene groove
- 2- BP @ the Supraclavicular fossa
- 3- BP @ the Infraclavicular fossa
- 4- BP @ the Axilla
- 5- Terminal branches of BP @ the Elbow
- 6- Terminal branches of BP @ the Forearm
- 7- Saphenous @ Add. Canal
- 8- Sciatic @ pop-fossa
- 9- Terminal Branches @ ankle

References

- 1- Mcleod, GA, McCartney, C.J.L., Wildsmith, J.A.W. , Principles and Practice of Regional Anesthesia, 4th edition, Oxford 1993, PP 170-187
- 2- Kaye, A.D., Urman, RD, Vadivelu, N, Essentials of Regional Anesthesia, Springer 2012, PP 339-383
- 3- Hadzic, A Hadzic's Peripheral nerve Block and anatomy for ultrasound- guided regional anesthesia, 2nd Edition, McGraw-Hill 2012, PP 149-197
- 4- Hadzik, A The New York School of Regional Anesthesia Regional Anesthesia and Acute Pain Management, McGraw- Hill 2007, PP 43-79 , 373-441.

Questions and Comments

