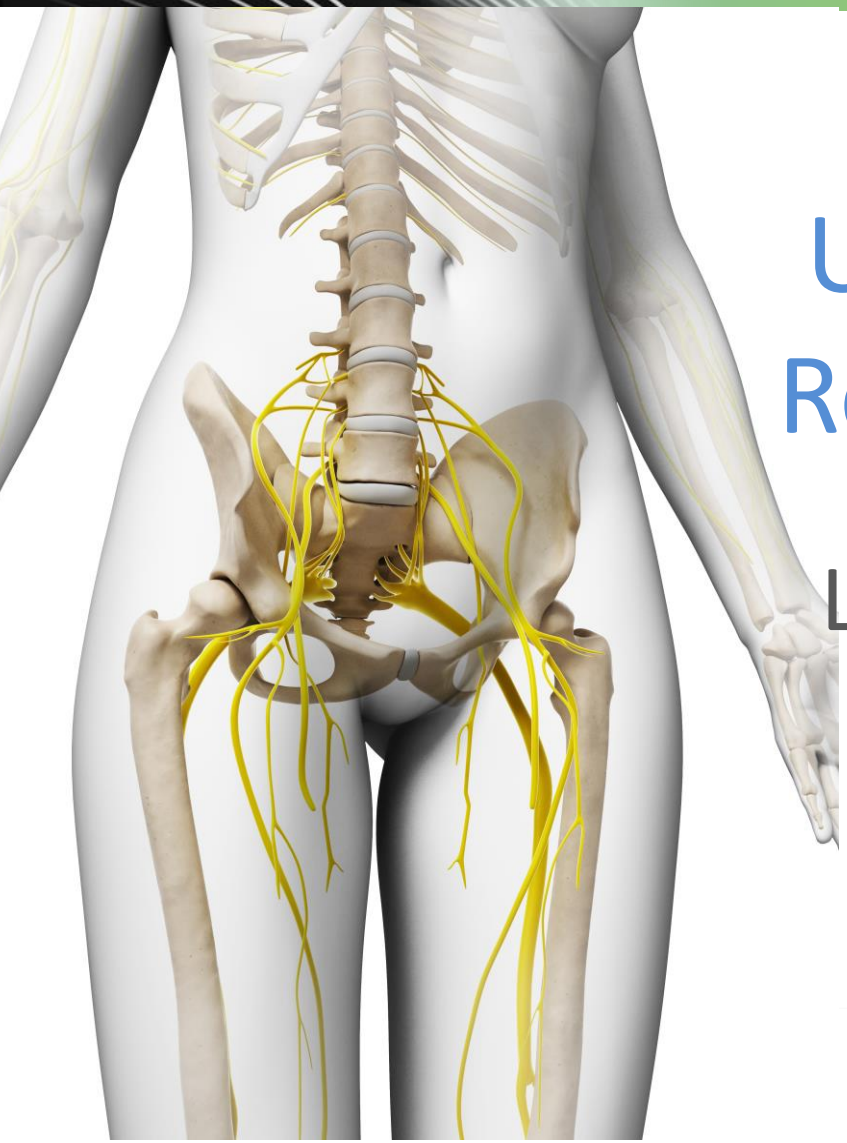


Ultrasound Guided Regional Anesthesia

Lower Extremity Blocks

Lower Extremity Nerve Blocks

- Femoral
- Sciatic
  - Transgluteal
  - Subgluteal
  - Anterior
- Saphenous
- Popliteal Sciatic

Objectives

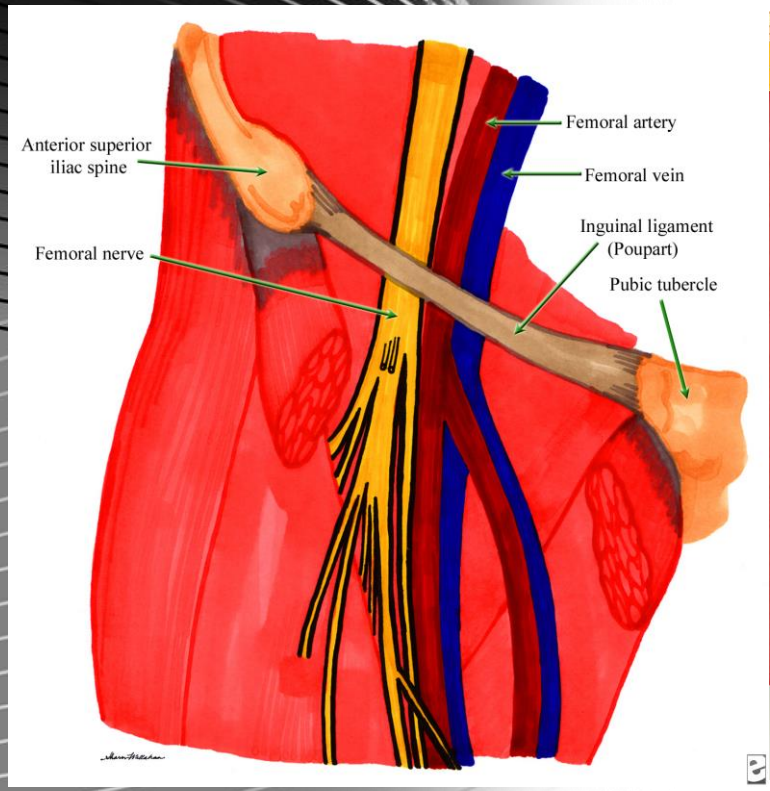
- Indications
- Goal of Block
- Anatomy
- Ultrasound Technique
- Ultrasound Landmarks

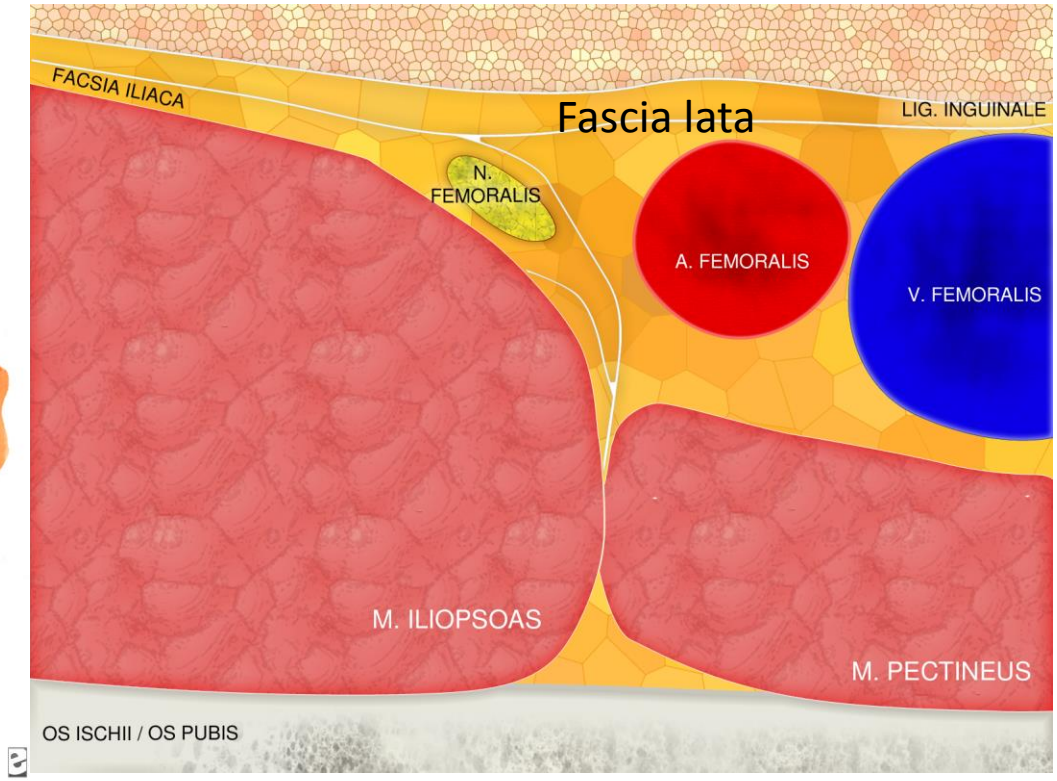
Femoral Nerve Block

- Indications: surgery anterior thigh and knee, quadriceps tendon repair, postop pain management
- Goal: deep to fascia iliaca surrounding nerve and behind femoral artery, if anesthesia is anterior to artery it is superficial to fascia iliaca
- Technique: In-plane
- Note: Nerve always lies deep to the fascia iliaca and should not be confused with the bright hyperechoic tissue lying above the fascia which is lymphatic tissue.

Anatomy Landmarks

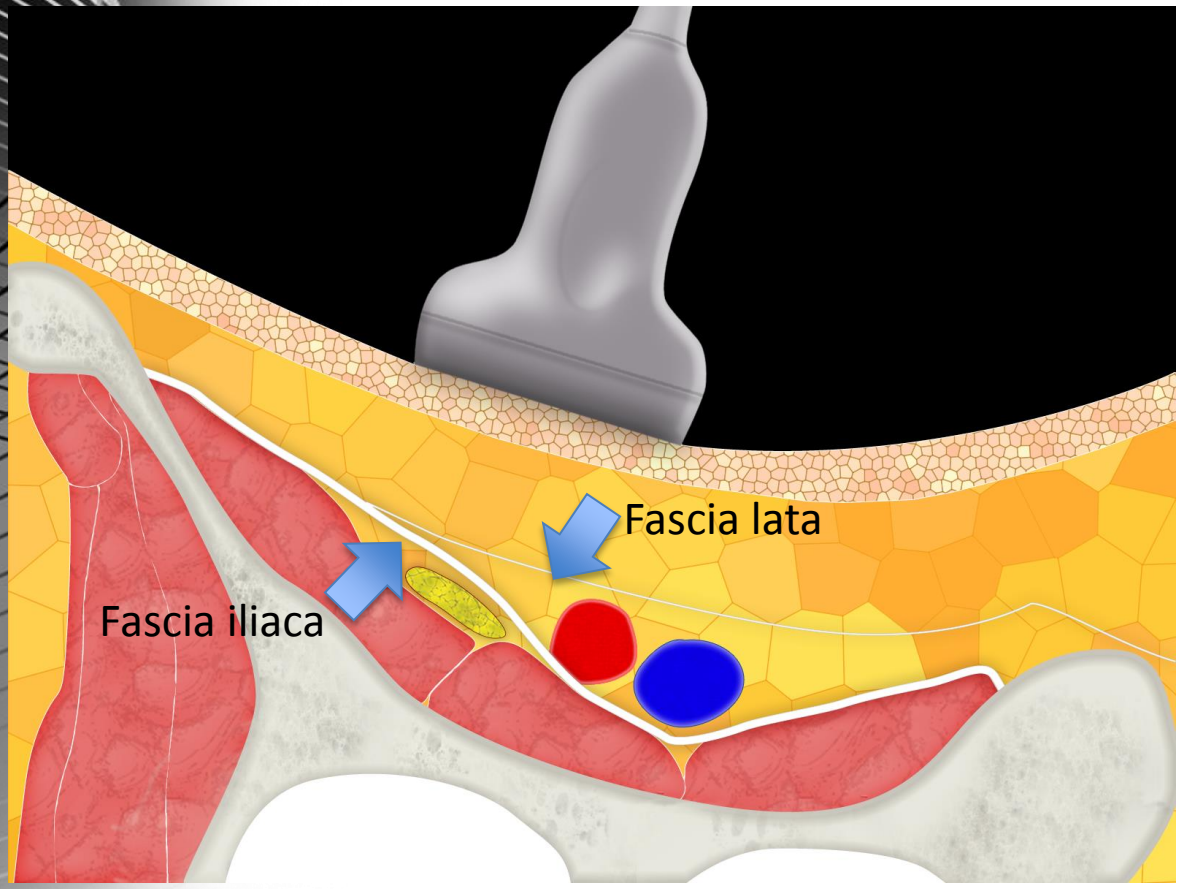
Femoral Nerve lies deep to Fascia Iliaca



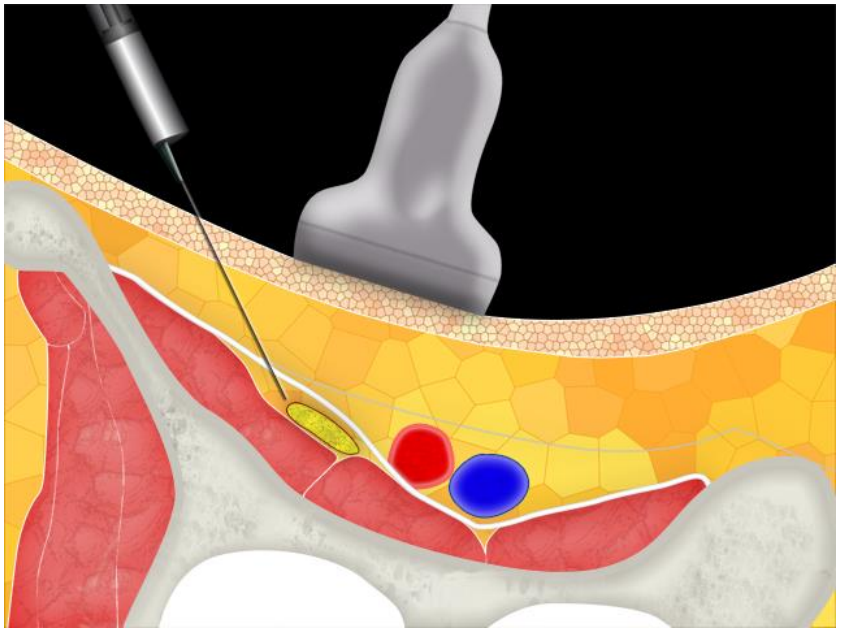


Anatomy Landmarks

- Femoral Nerve lies deep to Fascia Iliaca



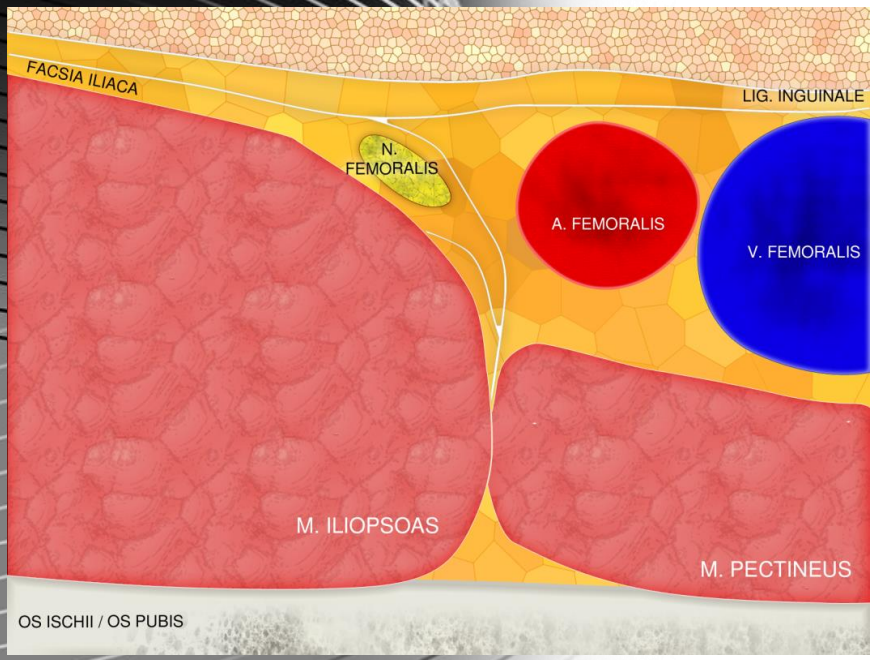
Transducer Position

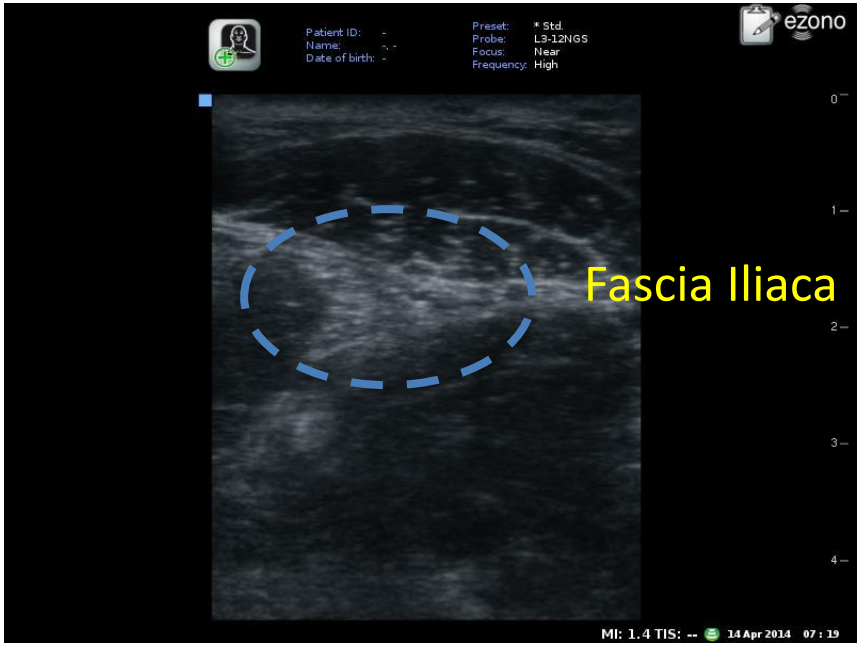


The transducer is placed just superior to the inguinal skin crease
Orientation marker directed to the patient's right.
Common femoral artery is seen as a round, pulsatile structure.

Ultrasound Image

Femoral Nerve

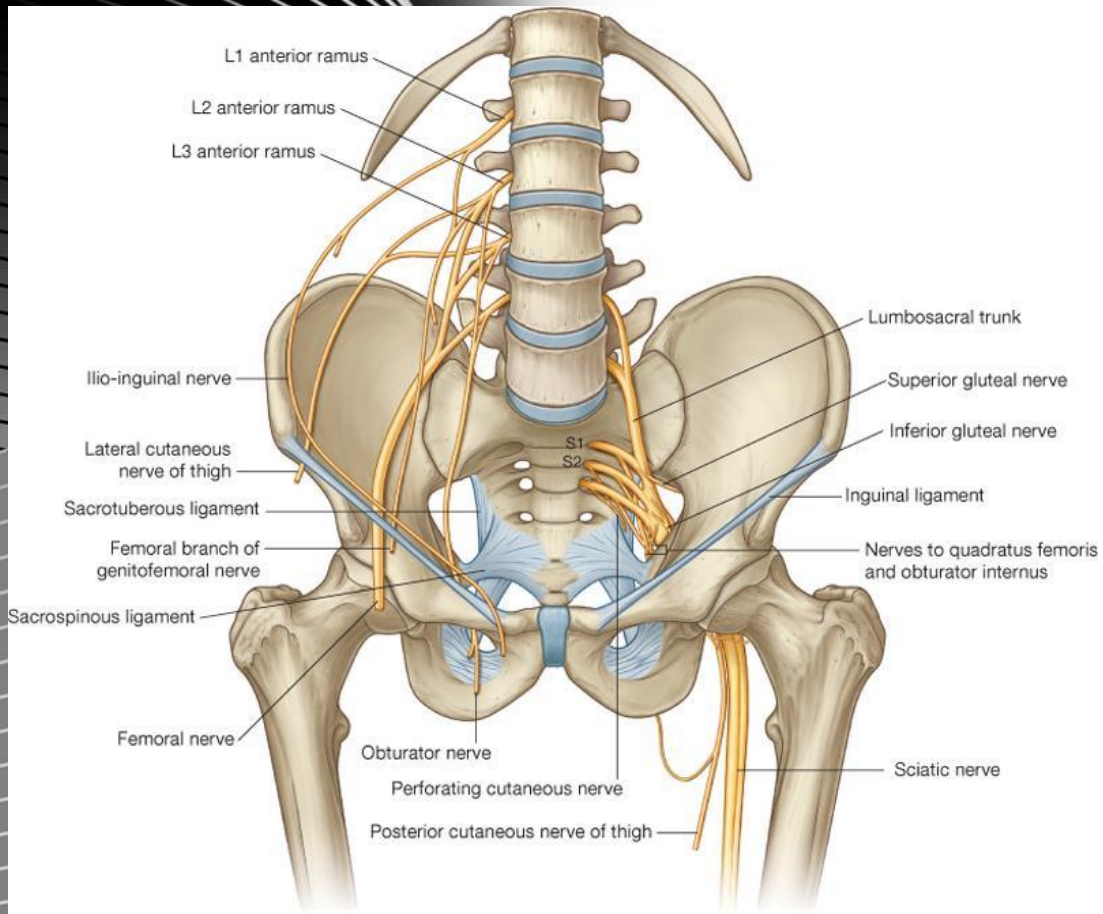


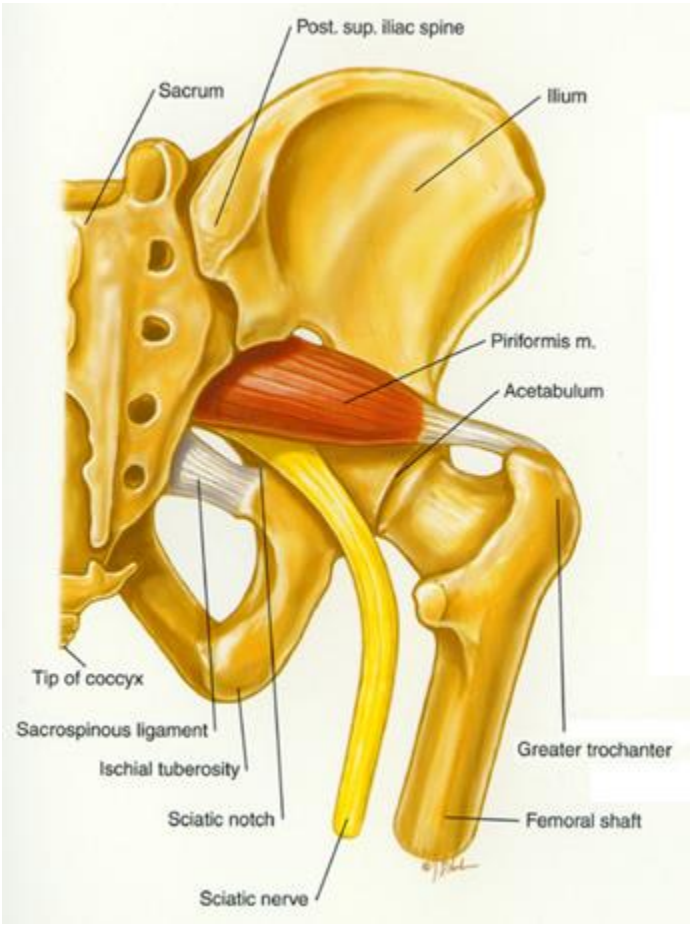


Sciatic Nerve Block

- Indications: Foot and ankle surgery, post op pain management, anesthesia below the knee
- Approaches:
  - Transgluteal: transverse posterior buttock between ischial tuberosity and greater trochanter
  - Subgluteal: transverse posterior thigh just below gluteal crease
  - Anterior: transverse proximal anteromedial thigh
- Transducer Type:
  - Curved array – Transgluteal, Subgluteal, Anterior
  - Linear array - Subgluteal

Anatomy



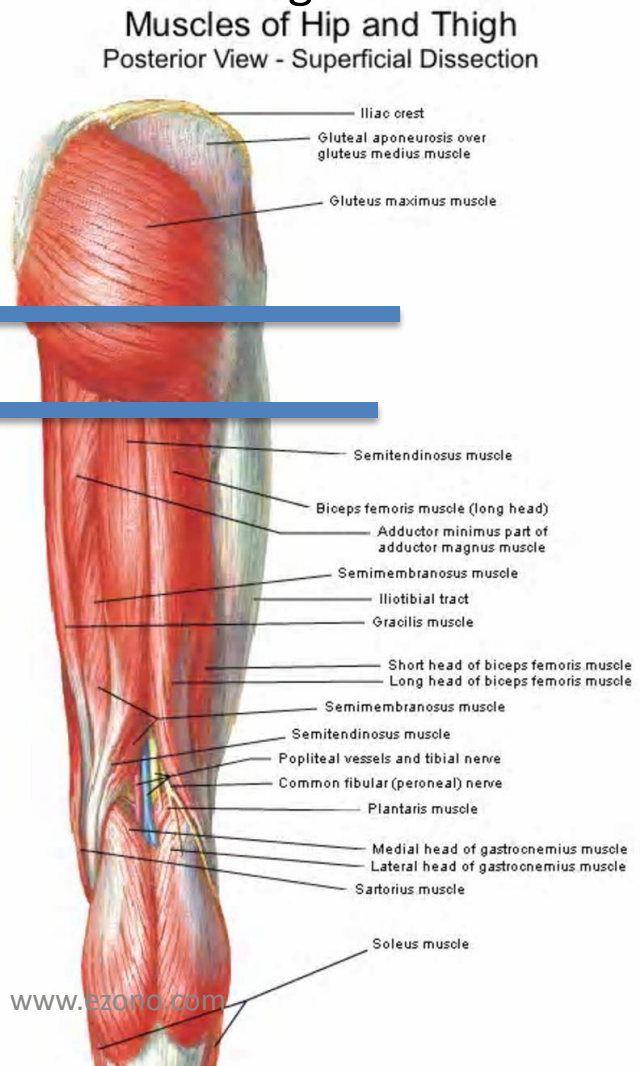


Posterior Sciatic Nerve Block

Transgluteal

Subgluteal

Posterior View Thigh

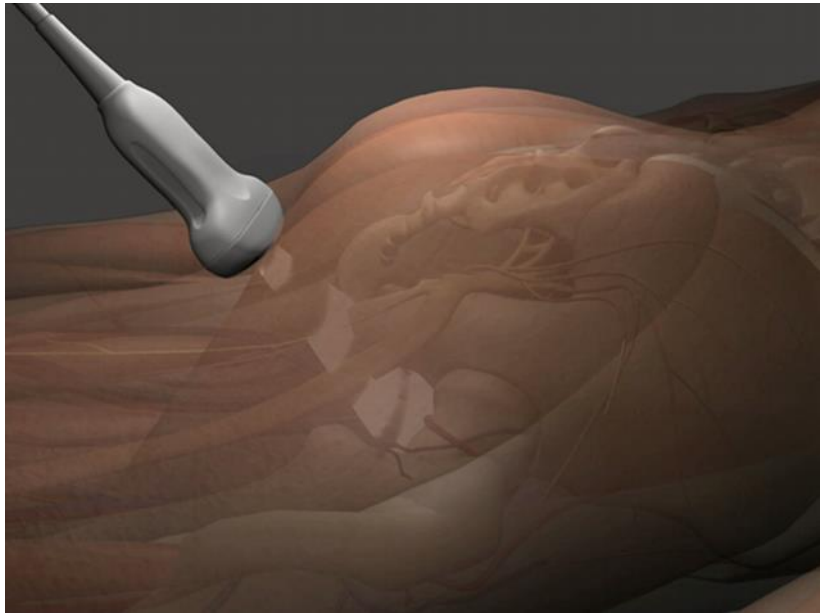


Sciatic Nerve Transgluteal

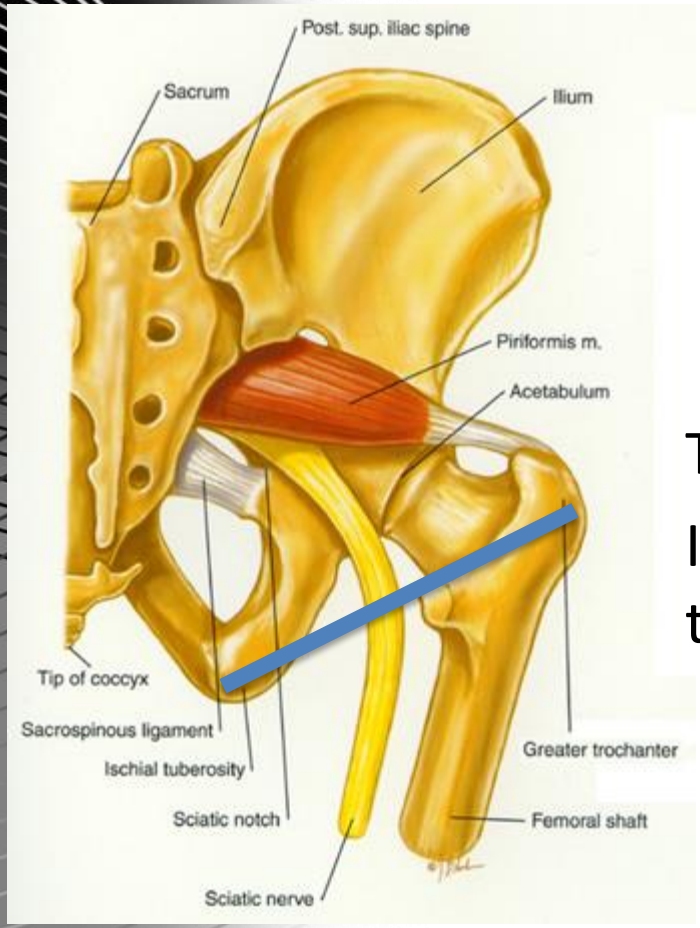
- Goal: Adjacent to sciatic nerve below fascial plane of gluteus muscles, circumferential spread
- Technique: In-plane from lateral
- Note: tilting the transducer is required to identify sciatic nerve at this location

Sciatic Nerve Transgluetal

- Patient Position: Prone or lateral decubitus (legs flexed hip and knee)
- Transducer Position: just proximal to gluteal fold



Boney Landmarks

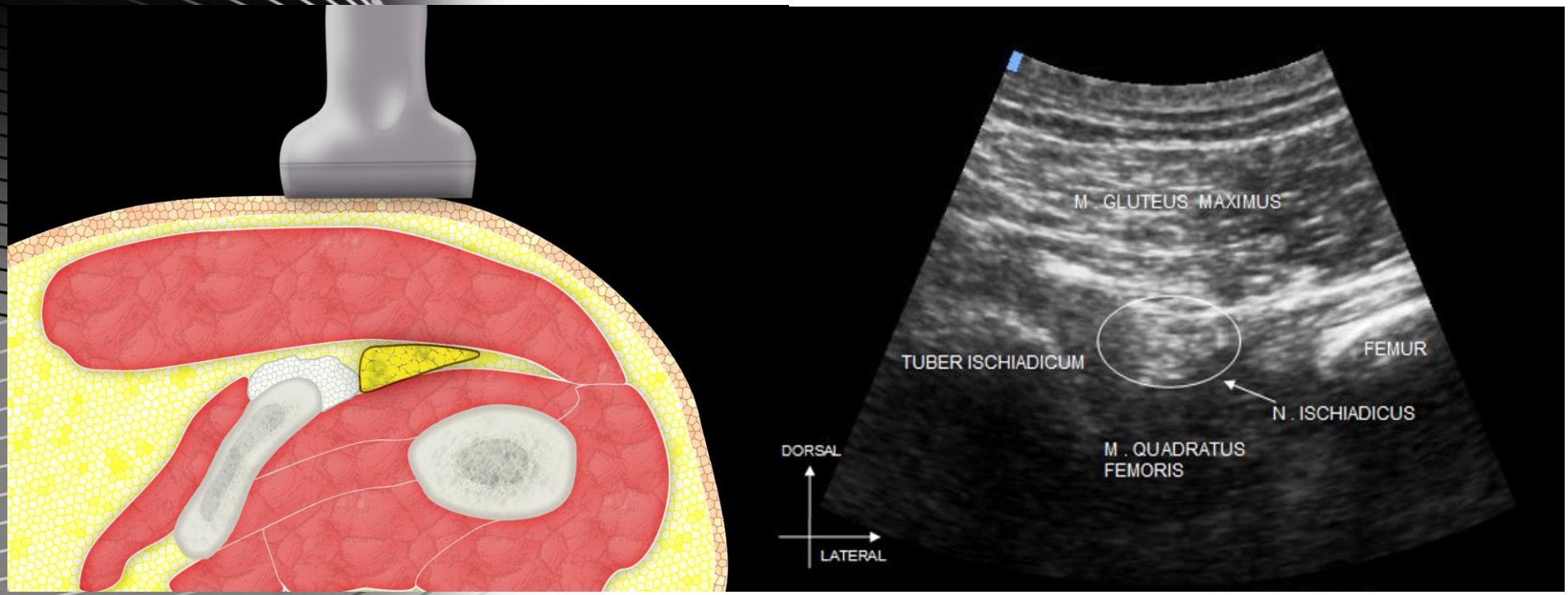


Transgluteal Transducer Position

Imaging Plane = Ischial Tuberosity to Greater Trochanter

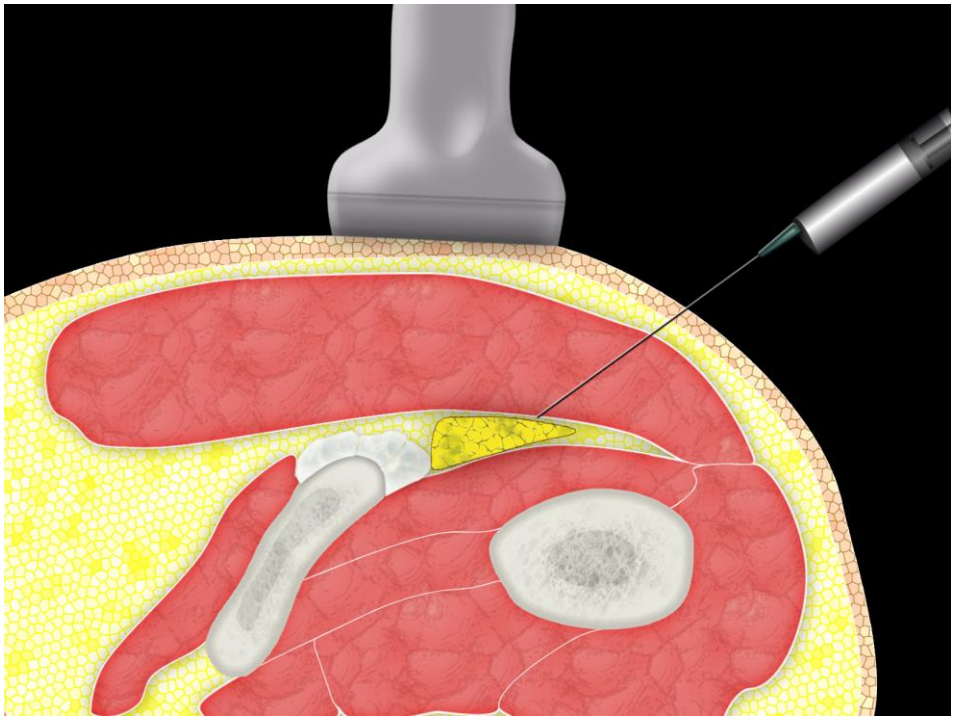
Boney Landmarks

Transgluteal Sciatic Nerve



Transgluteal Needle Path

- In plane
- Needle 1-2 cm lateral
- Initial end point lateral and deep to nerve
- May need to redirect anterior and medial to nerve for circumferential spread

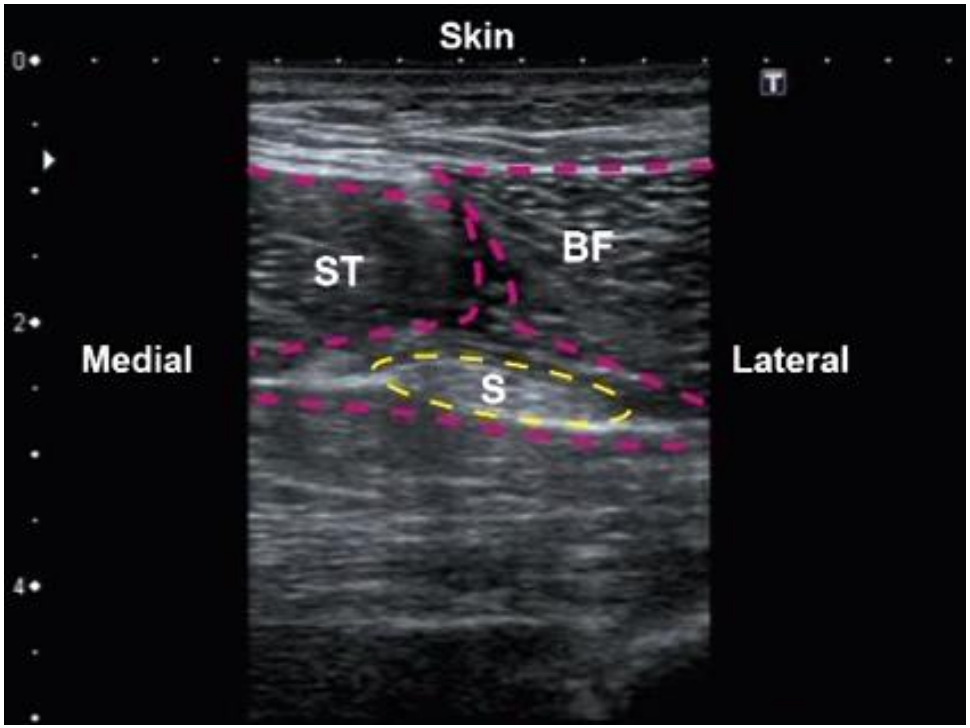


Subgluteal Sciatic Nerve

- Goal: Adjacent to sciatic nerve below fascial plane of gluteus muscles, circumferential spread
- Technique: In-plane from lateral
- Note: tilting the transducer is required to identify sciatic nerve at this location

Subgluteal Ultrasound Image

As the transducer is moved distally sciatic nerve becomes more oval in shape and found between BF an d ST



S= Sciatic Nerve BF = Biceps Femoris

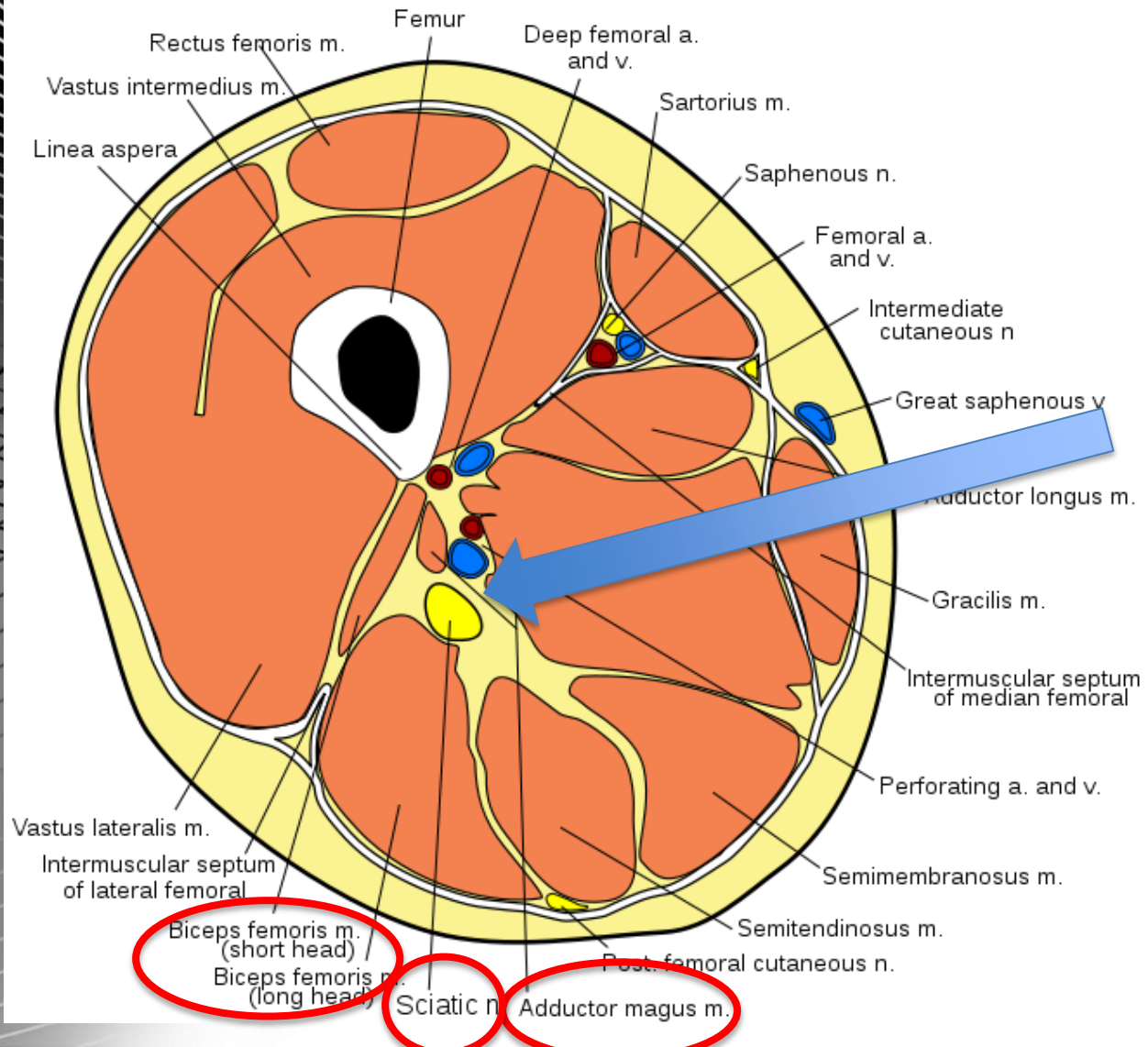
ST = Semitendinousus

BF + ST = hamstrings

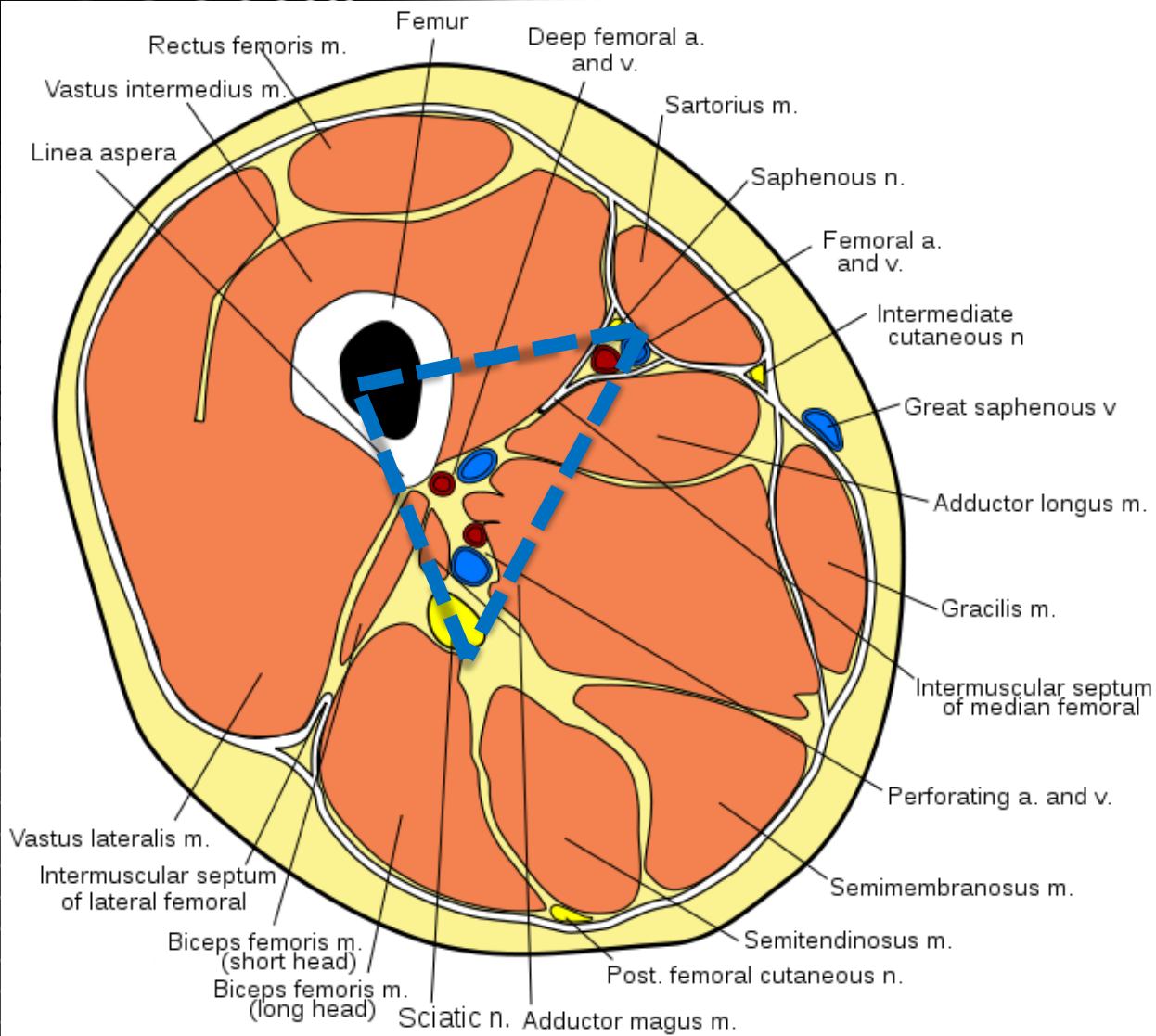
Sciatic Nerve Block Anterior

- Indications
  - Used if patient cannot be positioned in lateral position due to pain or trauma
  - Faster approach when doing femoral and sciatic nerve blocks together
- Goal: Needle adjacent to sciatic nerve between adductor and biceps femoris muscle
- Transducer Position: Anteromedial aspect of thigh
- Scan Depth:
  - 13-25 cms (deep and steep angle)
  - Nerve is deepest in this approach
- Technique: In Plane or Out of Plane
- Intermediate to Advanced Block

Landmarks Sciatic Nerve



Landmarks Sciatic Nerve



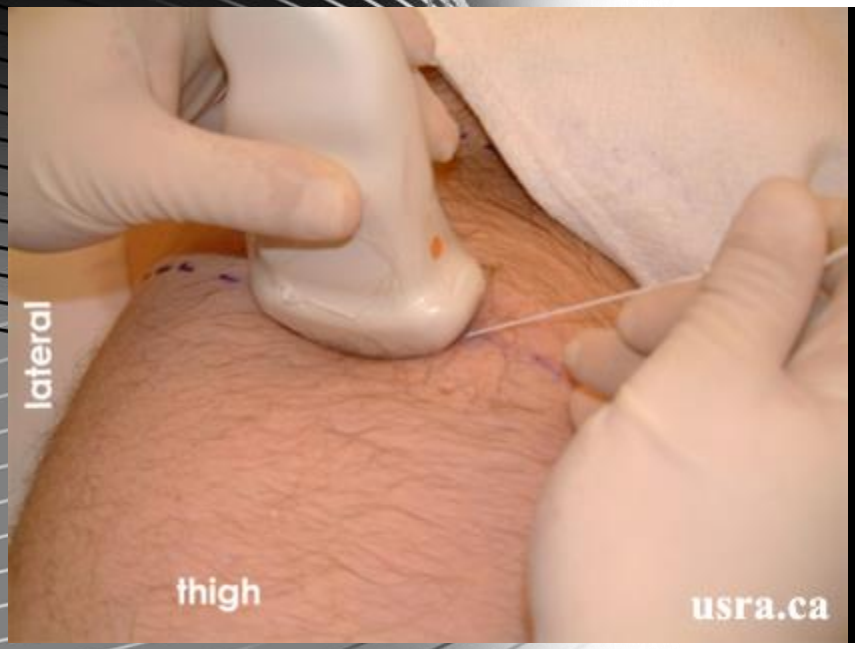
Tip: To locate sciatic nerve from anterior approach draw a line between femur and femoral vessels and sciatic nerve will be deep and middle

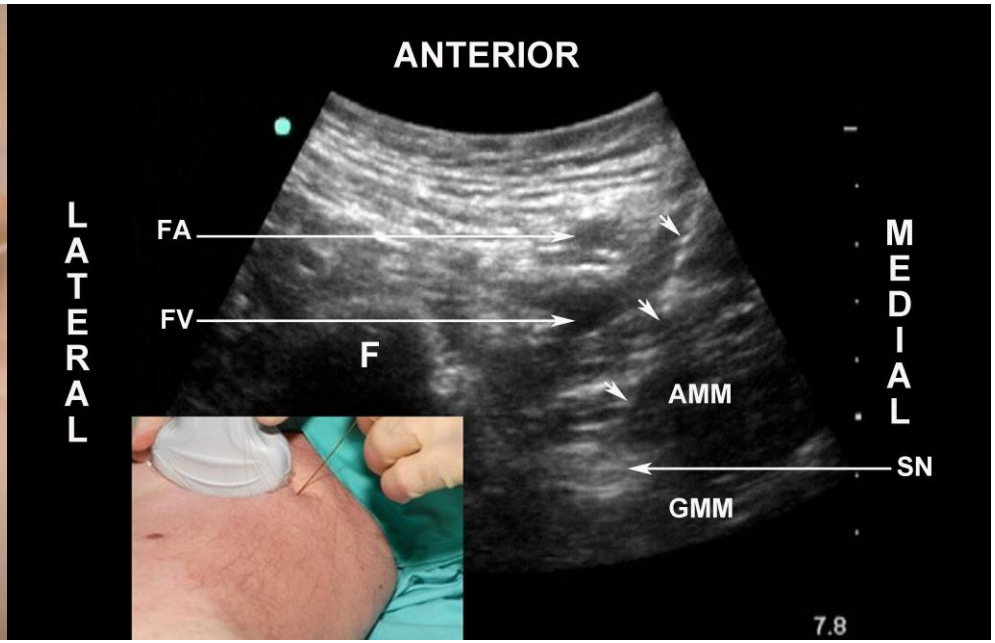
Anterior Sciatic Nerve

- Patient Position
  - Supine
  - Hip abducted 30 degrees
  - Hip and knee slightly flexed
- Transducer Position
  - Anteromedial aspect of thigh 8 cm from inguinal crease

Anterior Sciatic Nerve Block

In Plane Approach

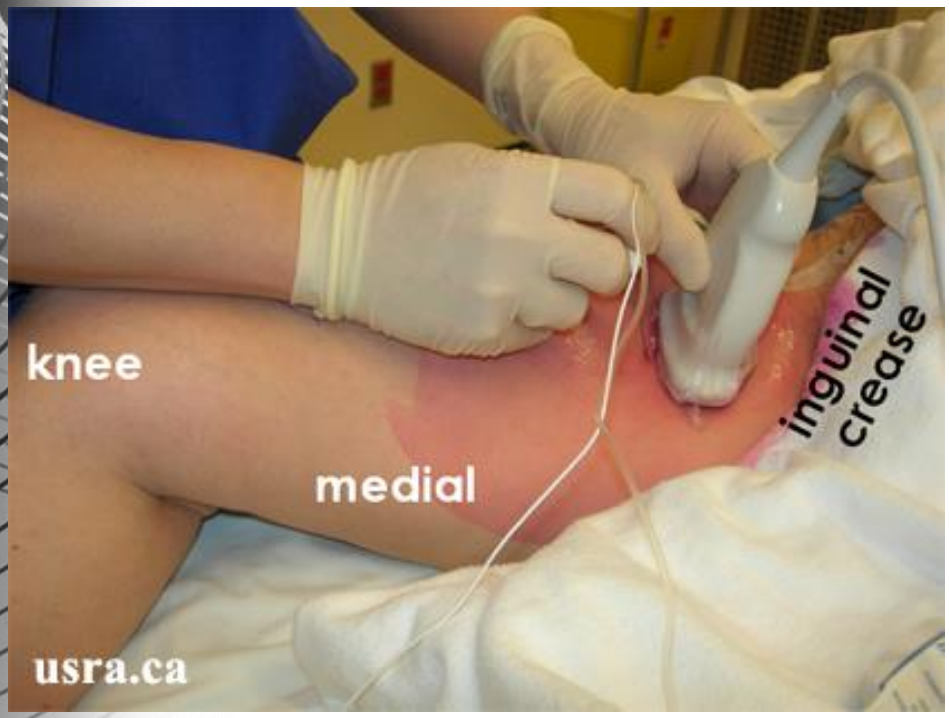




Medial to lateral approach, if thigh externally rotated anterior to posterior approach

Anterior Sciatic Nerve Block

Out of Plane Approach

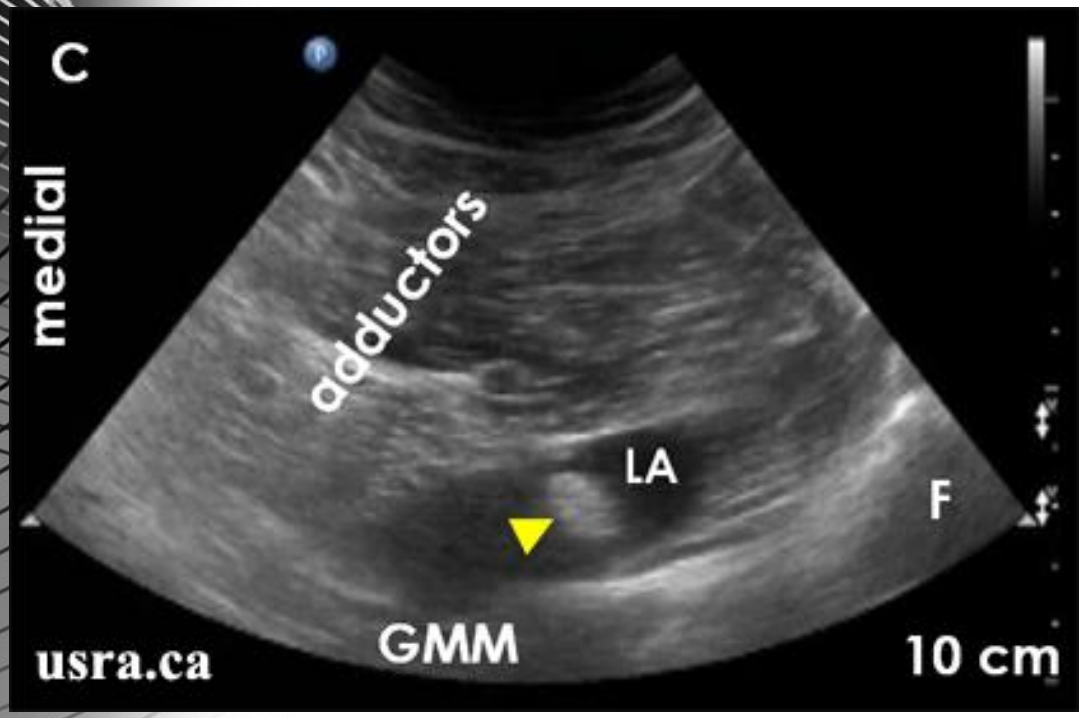


Align nerve with midpoint of transducer

Technically challenging block because needle is steep and target is deep

Anterior Sciatic Nerve Block

- Post injection

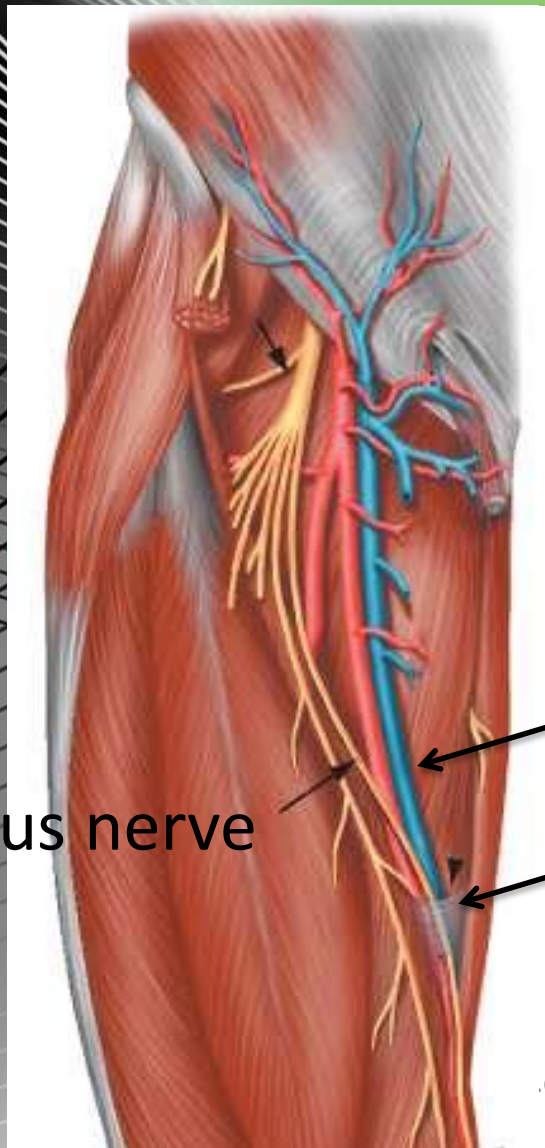


GMM = gluteus maximus F = Femur

Saphenous Nerve Block

- Indications: Done in combination with popliteal sciatic or lower anterior sciatic block for mid lower leg and ankle
- Goal: Needle tip medial to femoral artery in adductor canal below the sartorious muscle, circumferential spread around femoral artery
- Technique: In-plane or out of plane

Anatomy Landmarks



Saphenous nerve

Femoral vein

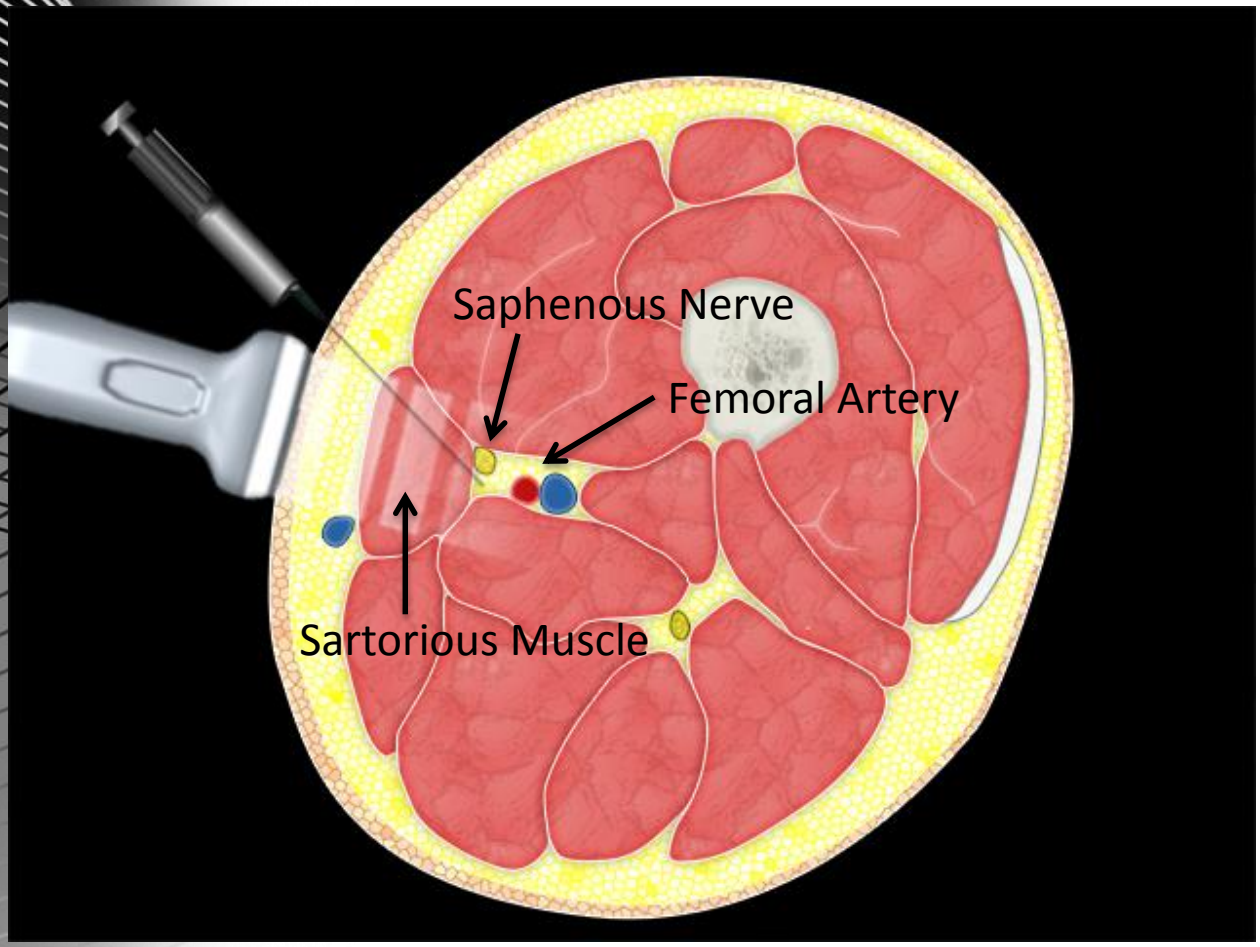
Adductor Canal

Tip: At this level nerve and vein are in close proximity

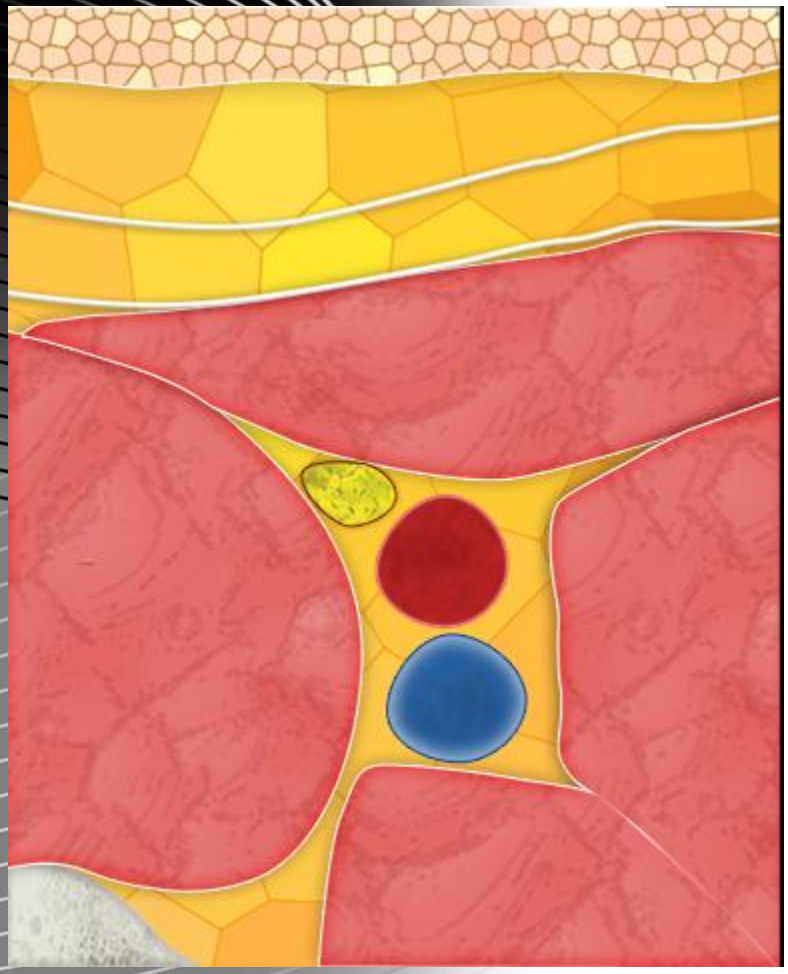
Saphenous Nerve

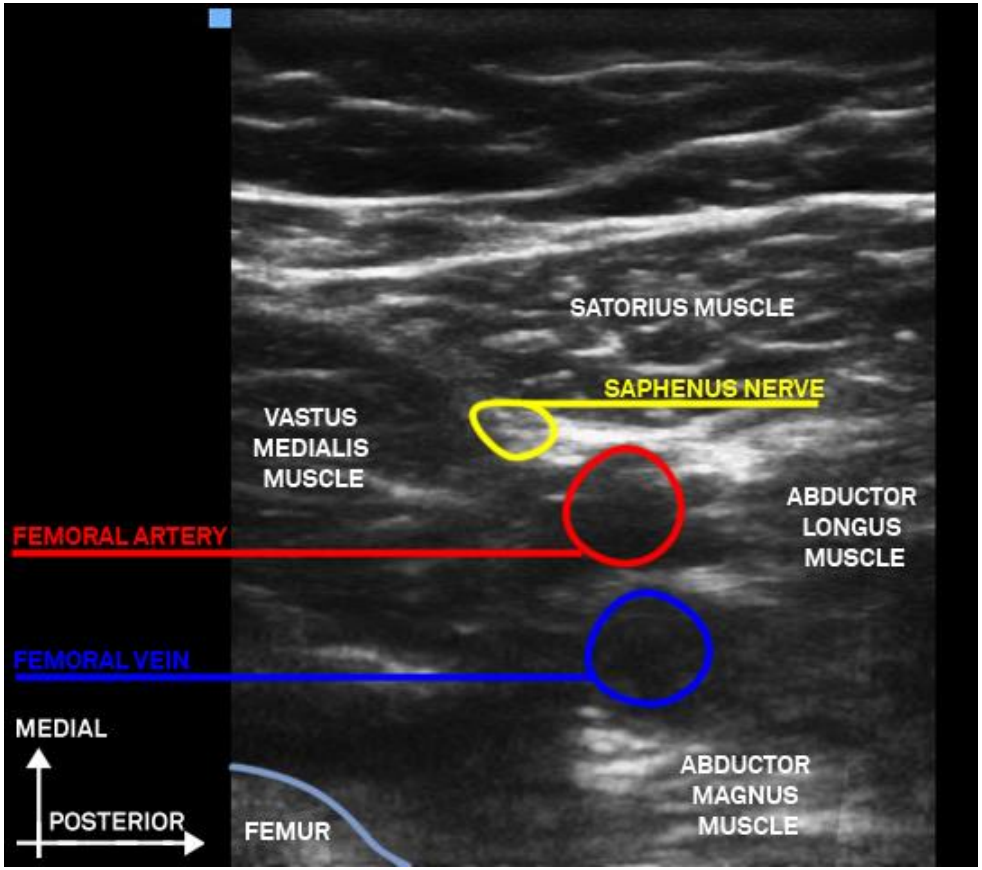
- Transducer Position

Saphenous Nerve Needle Path



Ultrasound Image Saphenous Nerve





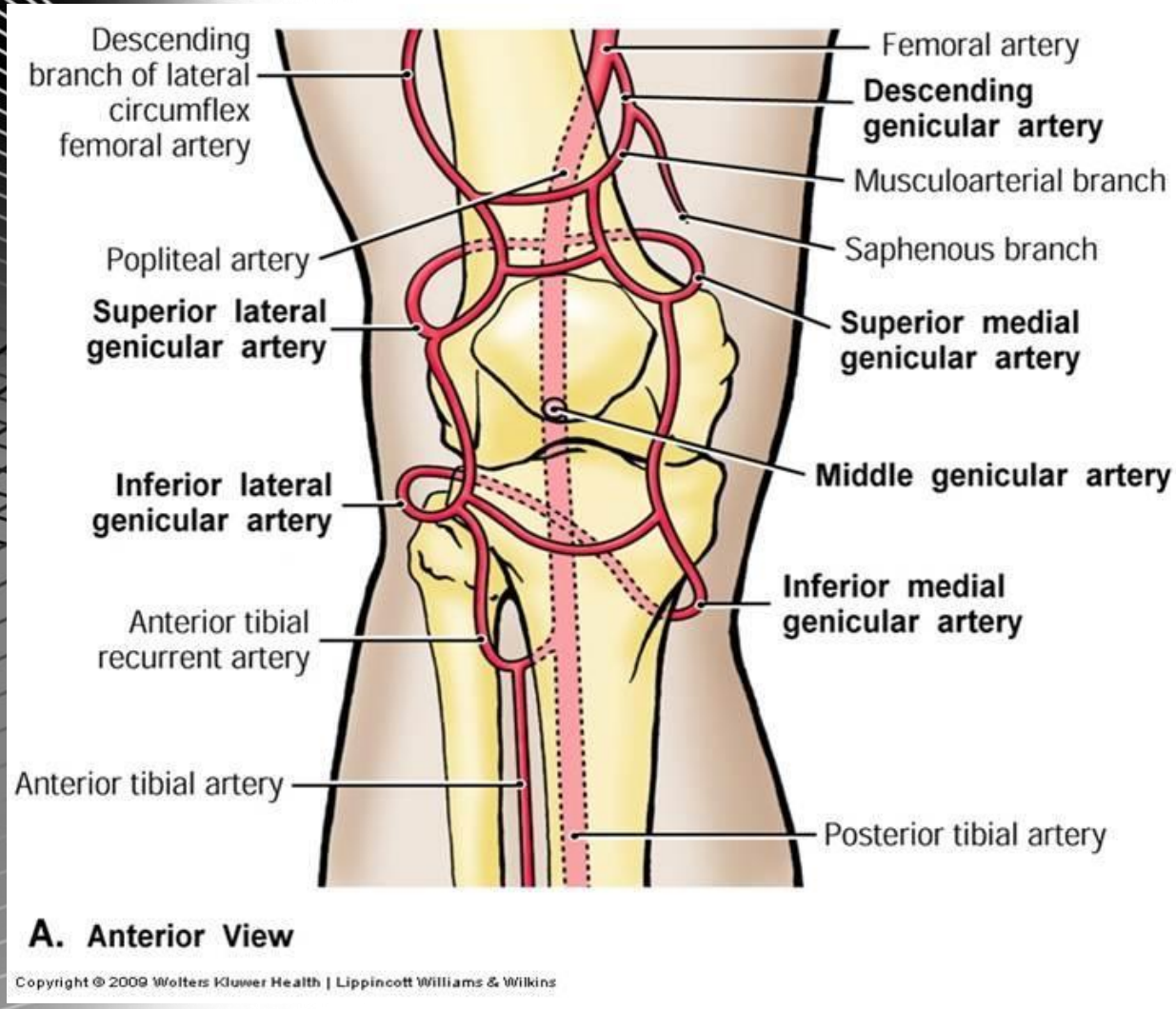
Saphenous Nerve Block

- Saphenous nerve is difficult to see
- May be seen as a bright hyperechoic oval or triangular structure
- Finding the nerve – follow the artery
  - Above knee: saphenous nerve travels with femoral artery beneath the sartorius muscle
  - Below the knee: adjacent to saphenous vein
- Nerve can lie either anterior or posterior to femoral artery

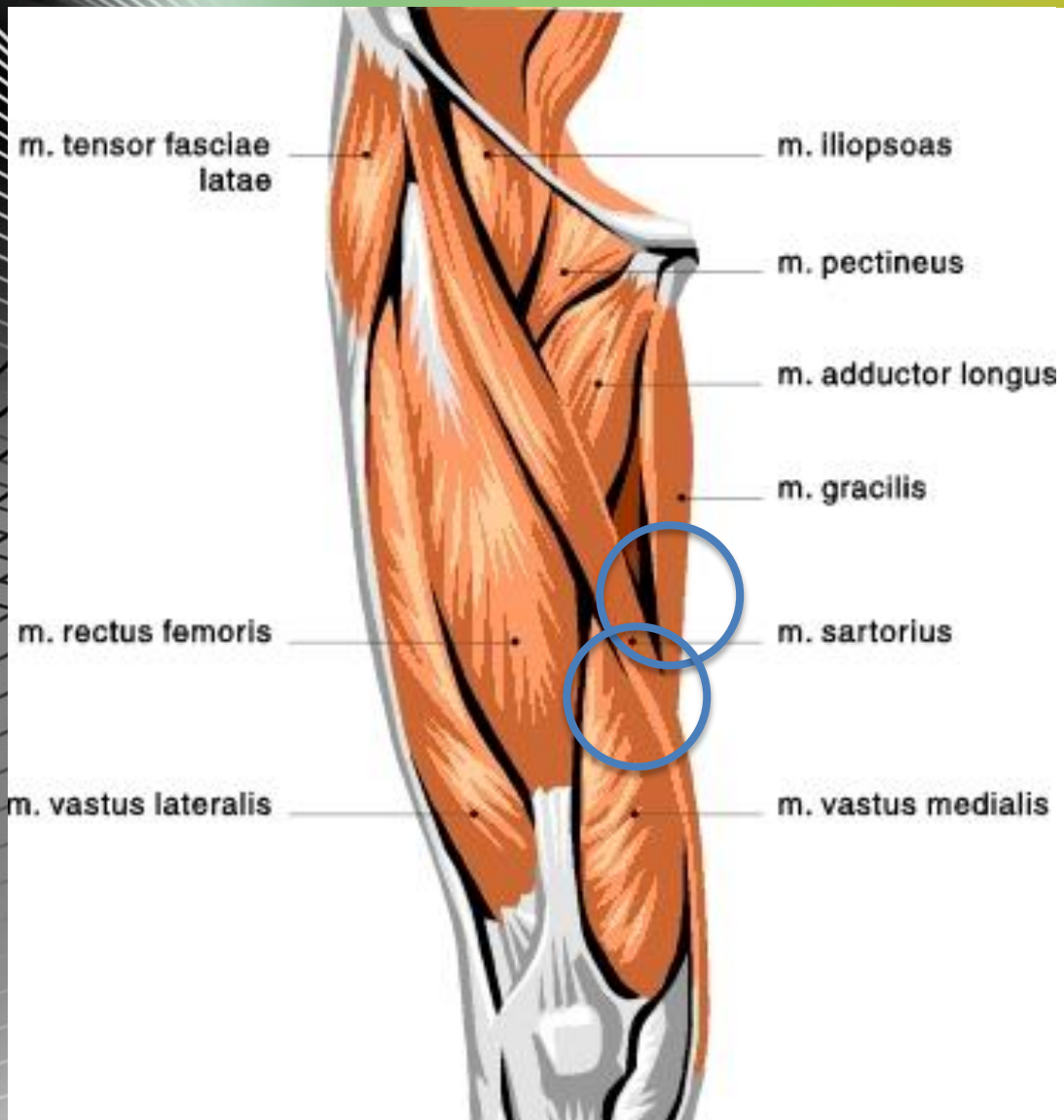
Saphenous Nerve

- Tips for locating
  - Follow the superficial femoral vessels
  - As artery goes deeper to travel through adductor canal a small artery will branch off and go superficial
  - Branching artery is descending genicular and will travel with saphenous
  - Use Color Doppler to locate genicular artery

Anatomy Landmarks



Saphenous Nerve Locations

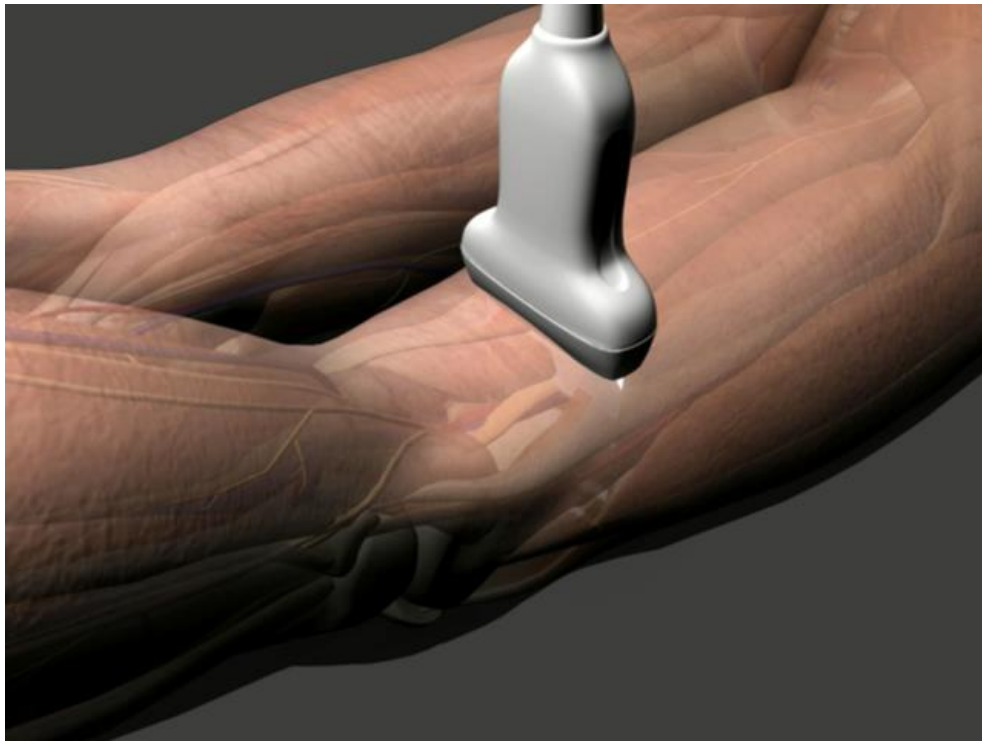


Popliteal Sciatic

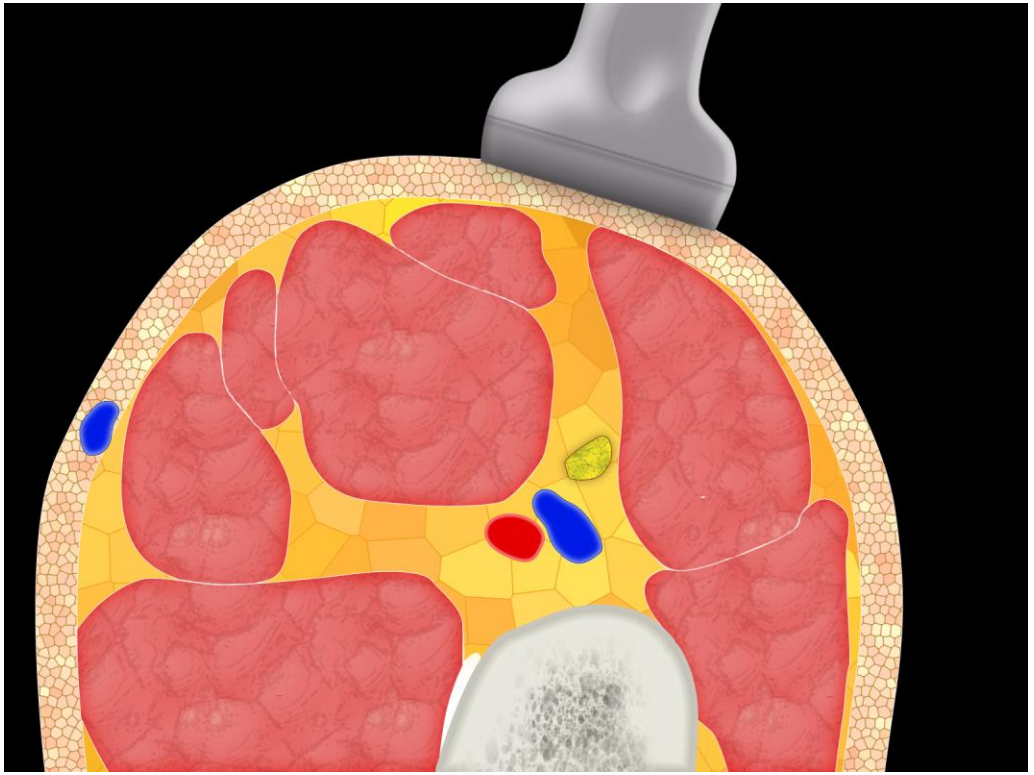
- Indications: Pain relief distal tibia and fibula.
- Goal: anesthetic around popliteal portion of sciatic nerve above the bifurcation to tibial and peroneal branches
- Technique: In-plane or out of plane
- Patient Position: Prone or lateral decubitus with pillow bolster between knees

Popliteal Sciatic Transducer Position

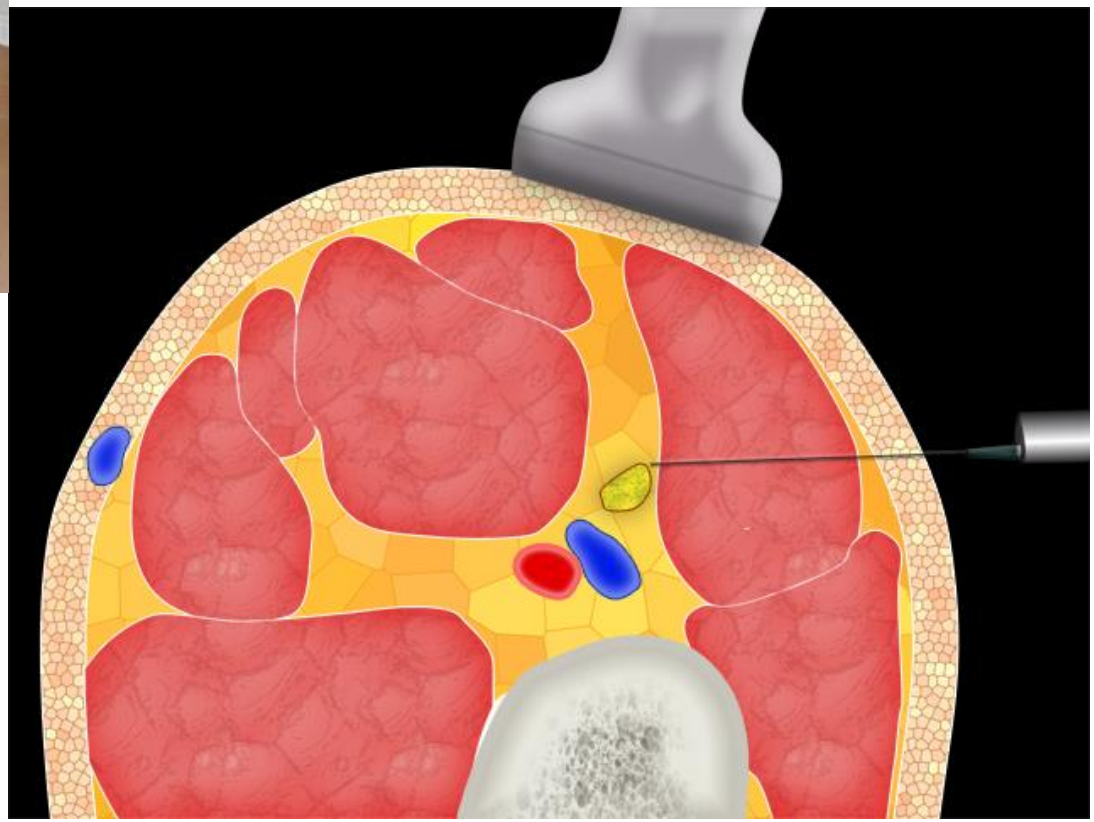
- Above knee joint
- Rock or tilt transducer for best reflection of nerve
- Identify bifurcation of tibial and peroneal nerves
- 8-10cm above crease



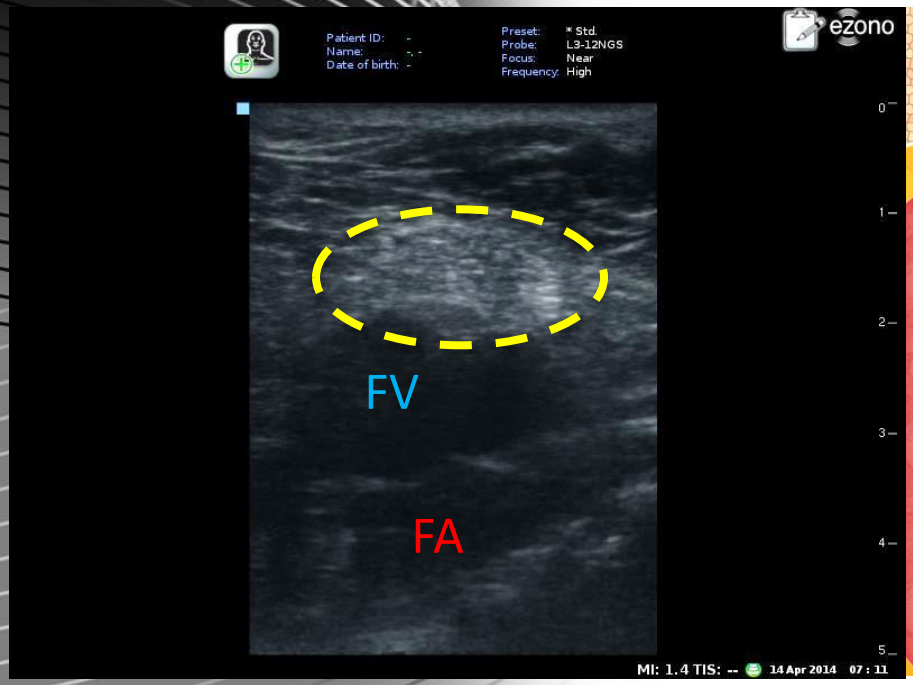
Popliteal Sciatic Transducer Position

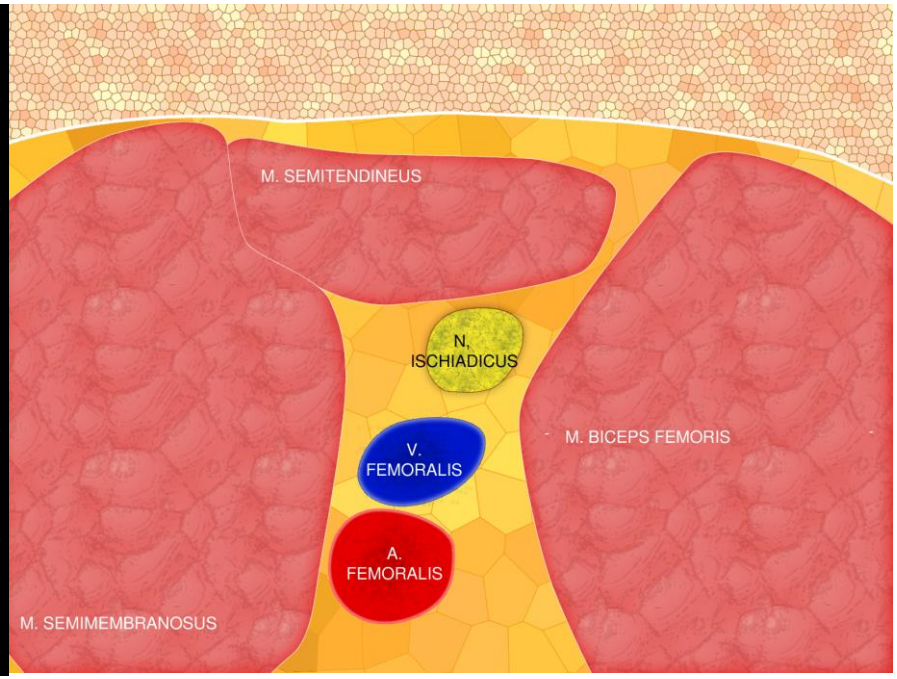


Popliteal Sciatic Transducer Position



Popliteal Sciatic Ultrasound Image

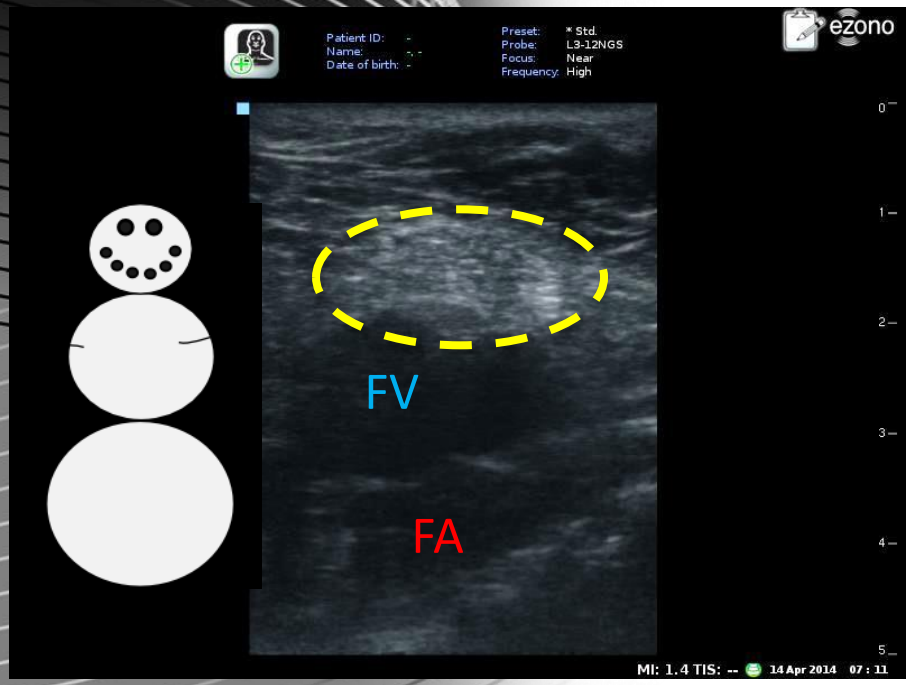




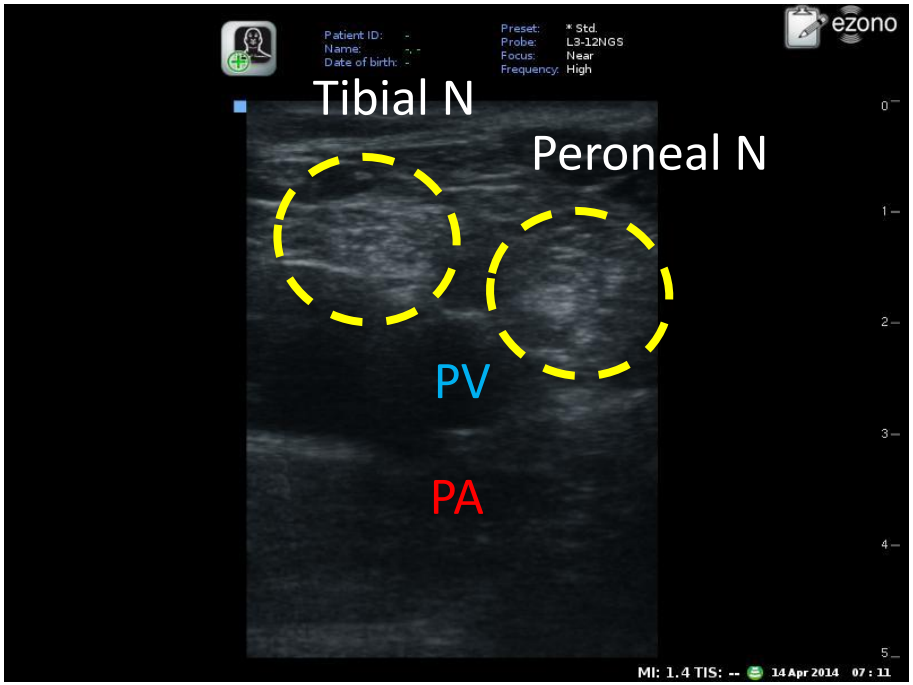
Popliteal sciatic may be at level of femoral vessels or popliteal vessels depending upon distance above the knee

Ultrasound Image

Proximal



Distal at Bifurcation



Tip! Snowman Sign
Nerve is the head

Summary

- Essential to know your anatomy
- Nerves in extremity are bright or hyperechoic
- Very helpful to have tip and tricks for ultrasound identification of structures
- Remember to rock and tilt transducer for best reflection of nerve. This is key in lower extremity imaging of nerves.

Lower Extremity Nerve Blocks

- Femoral
- Sciatic
  - Transgluteal
  - Subgluteal
  - Anterior
- Saphenous
- Popliteal Sciatic