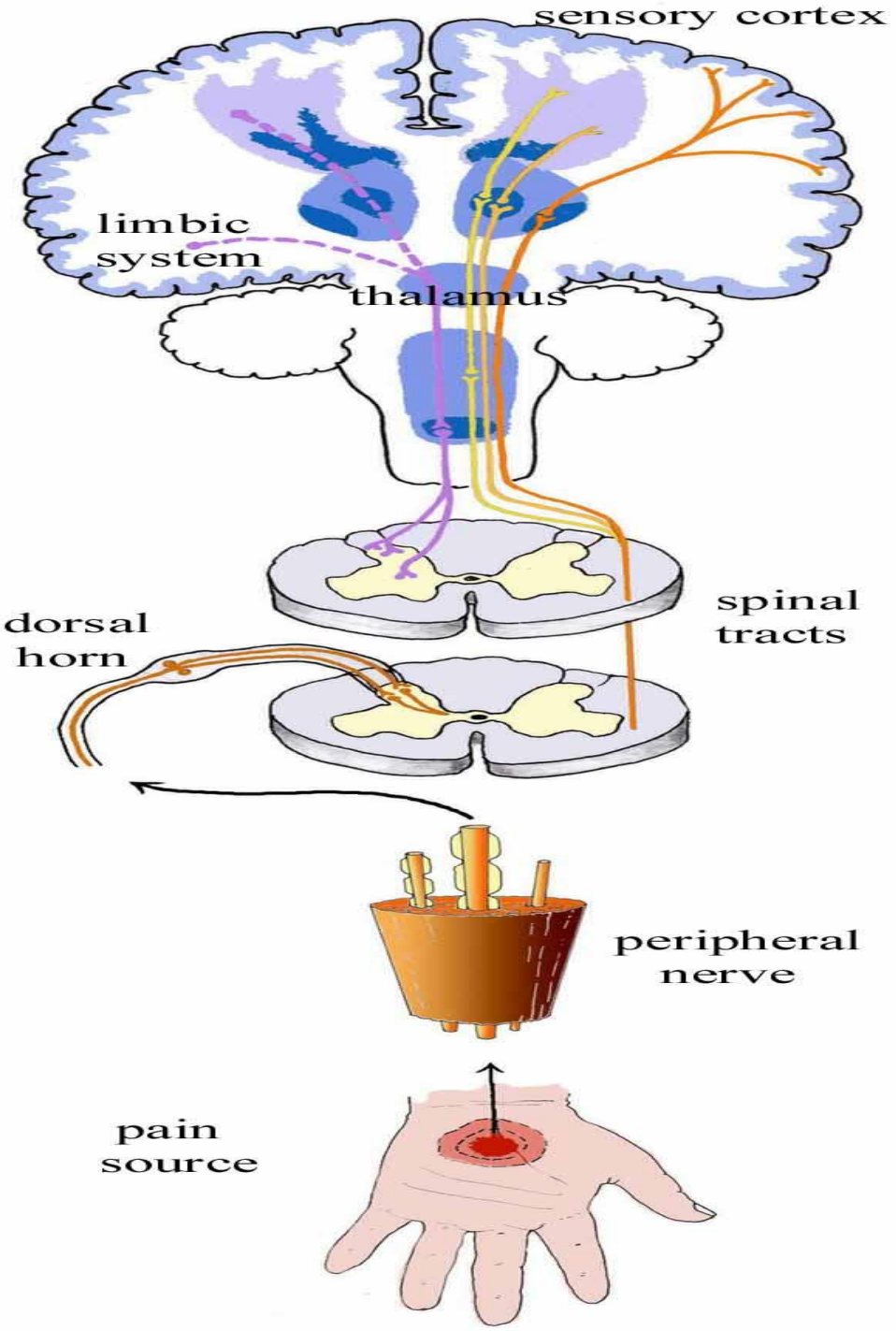
Nerve block

Pain pathway

- Spinothalamic tract



Regional anesthesia

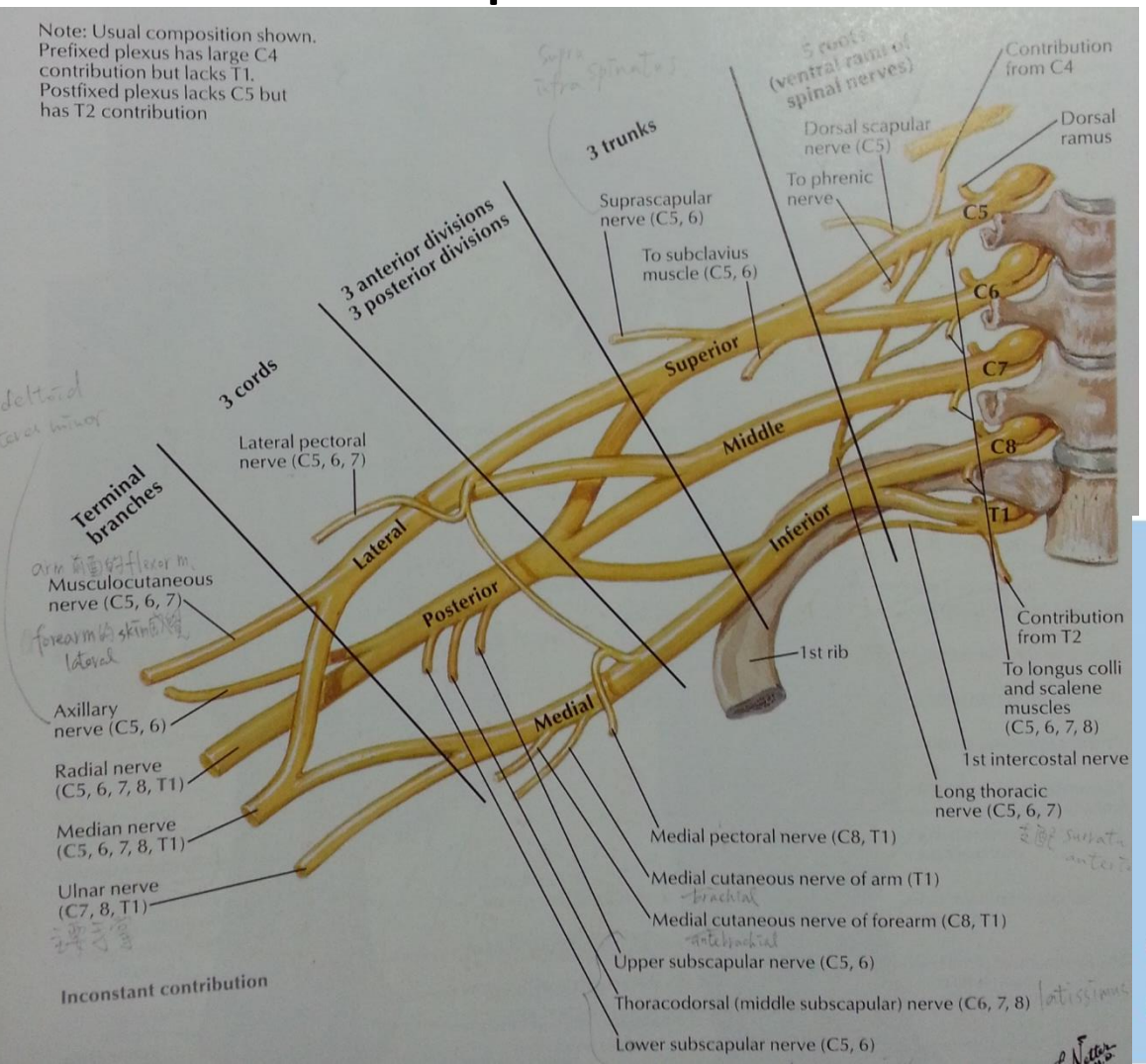
- Spinal anesthesia
- Epidural anesthesia
- Peripheral nerve block

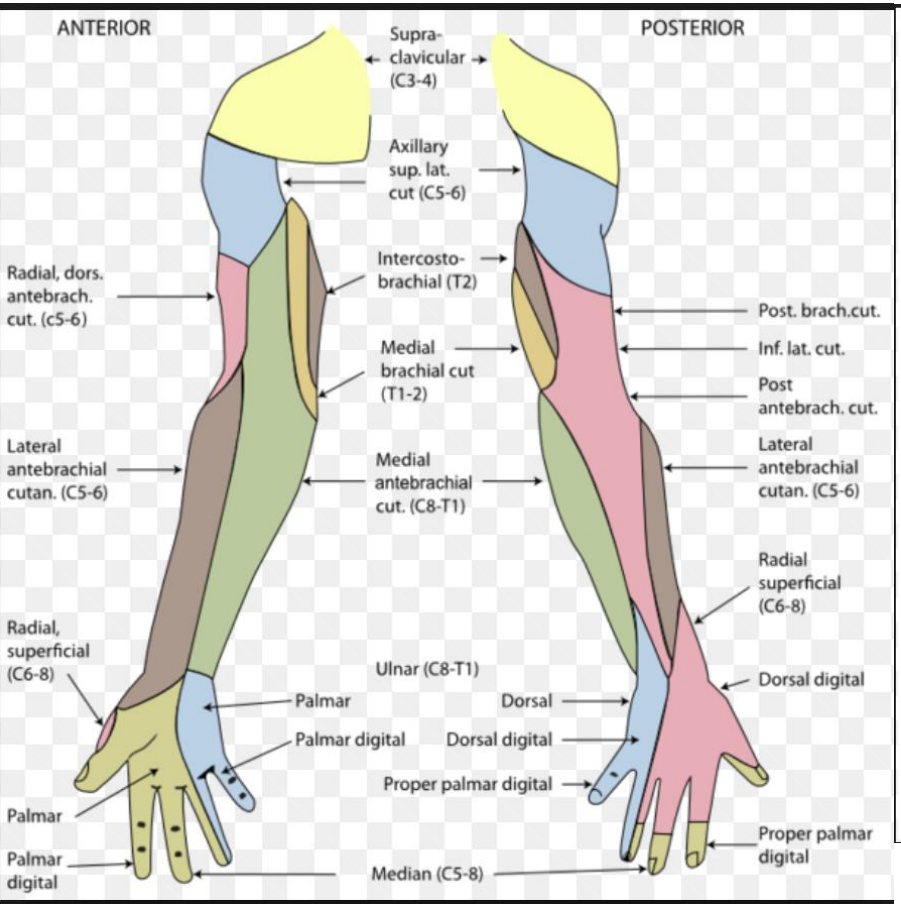
Nerve block

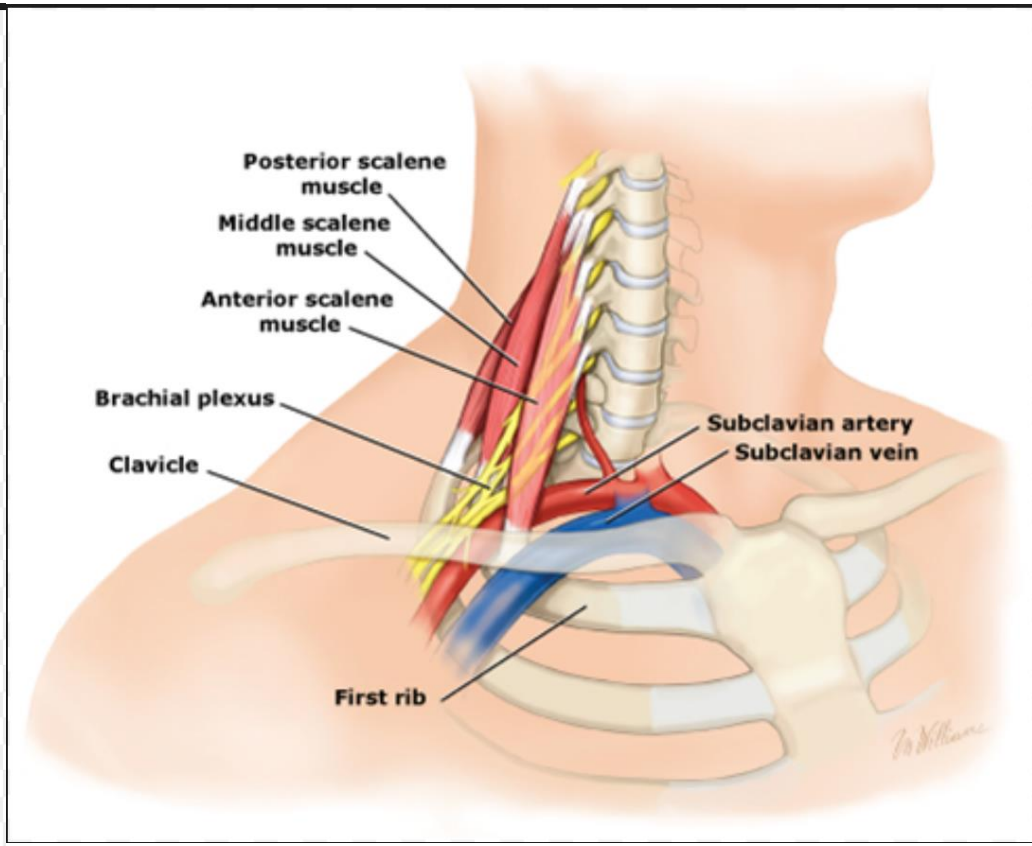
- Head and neck
- Cervical region
- Shoulder
- Upper extremity
- Thoracic region
- Lumbosacral spine
- Abdomen and pelvic
- Lower extremity

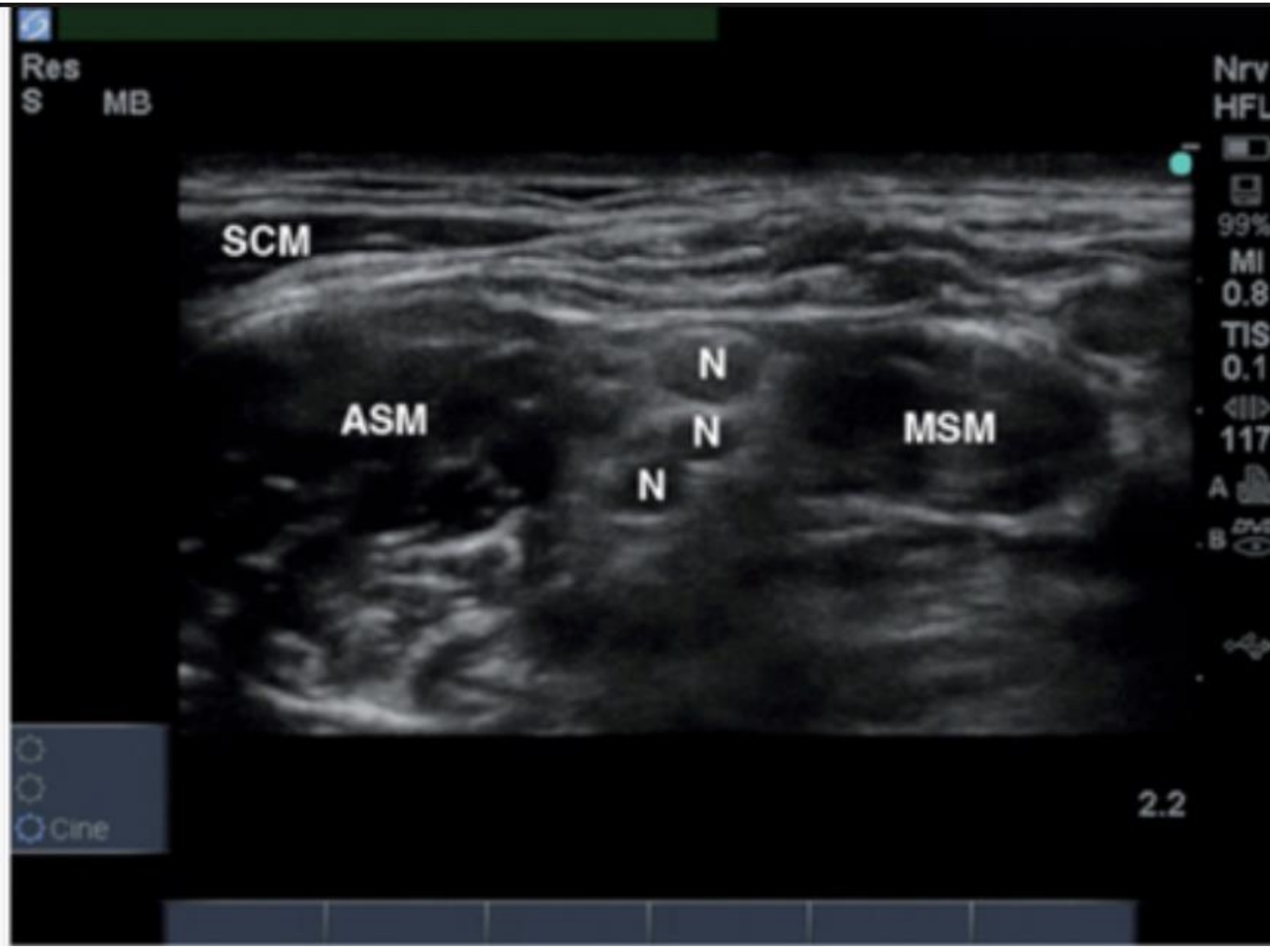
常見nerve block

- Brachial plexus block

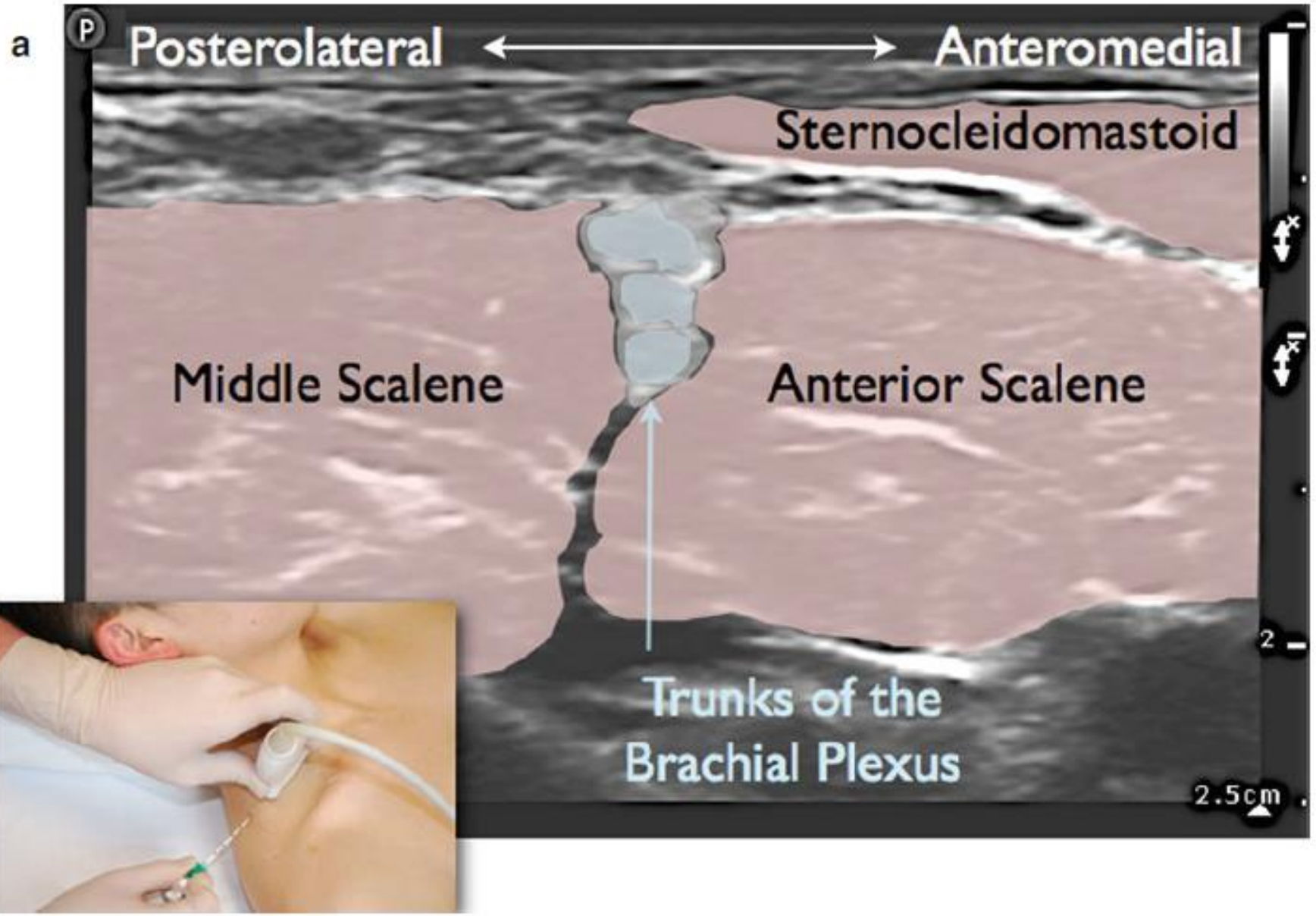



ANTERIOR
POSTERIOR
Supra-clavicular (C3-4)
Axillary sup. lat. cut (C5-6)
Intercosto-brachial (T2)
Radial, dors. antebrach. cut. (c5-6)
Medial brachial cut (T1-2)
Post. brach.cut.
Inf. lat. cut.
Post antebrach. cut.
Lateral antebrachial cutan. (C5-6)
Medial antebrachial cut. (C8-T1)
Lateral antebrachial cutan. (C5-6)
Radial superficial (C6-8)
Radial, superficial (C6-8)
Ulnar (C8-T1)
Dorsal digital
Palmar
Dorsal
Palmar digital
Dorsal digital
Proper palmar digital
Palmar
Proper palmar digital
Palmar digital
Median (C5-8)

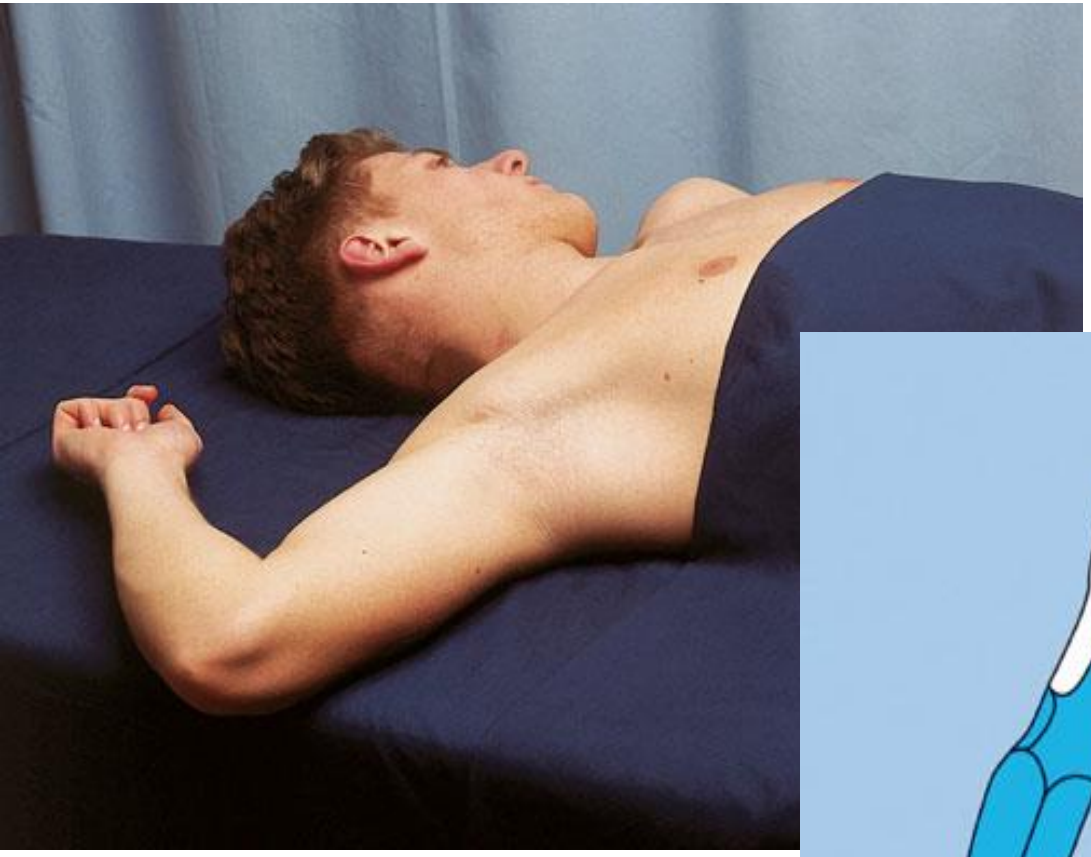

Posterior scalene muscle
Middle scalene muscle
Anterior scalene muscle
Brachial plexus
Clavicle
Subclavian artery
Subclavian vein
First rib

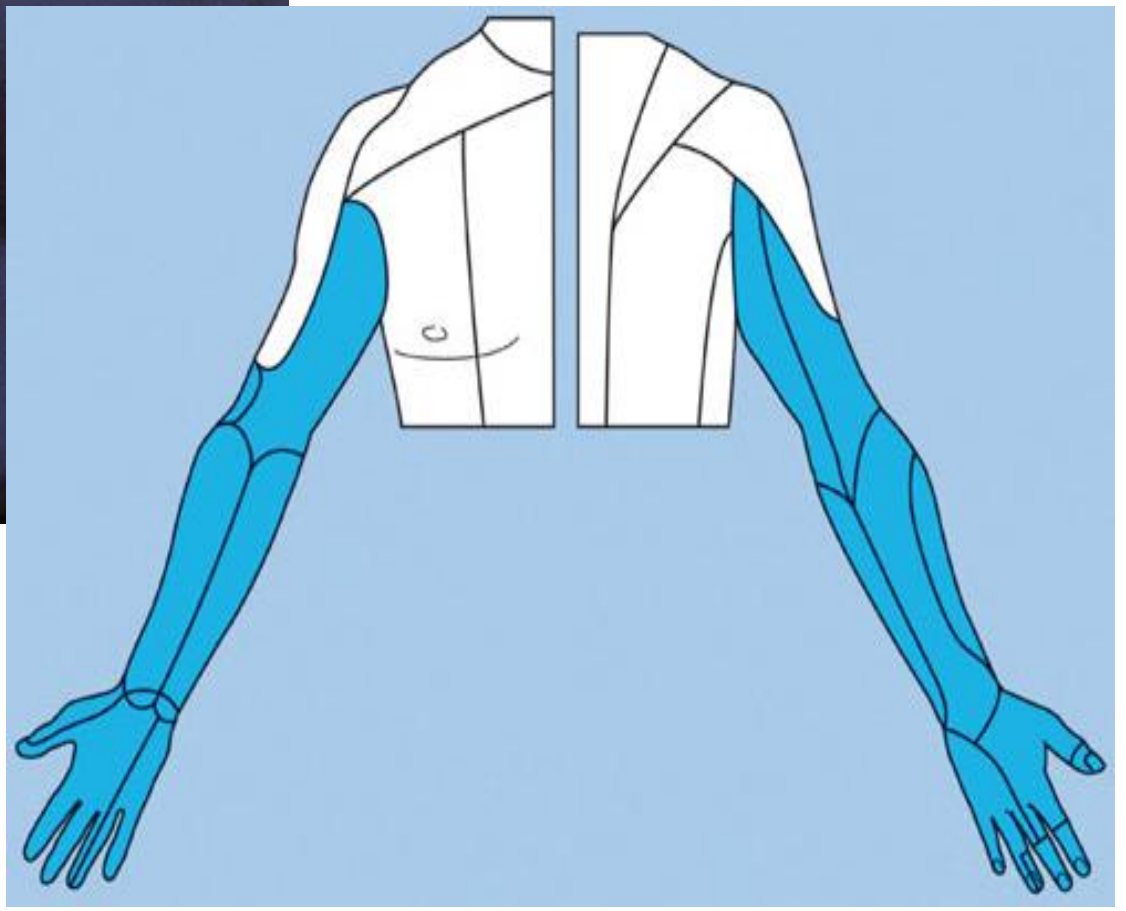

Res
S MB
Nrv
HFU
99%
MI
0.8
TIS
0.1
117
A
B
SCM
N
ASM
N
MSM
N
Cine
2.2

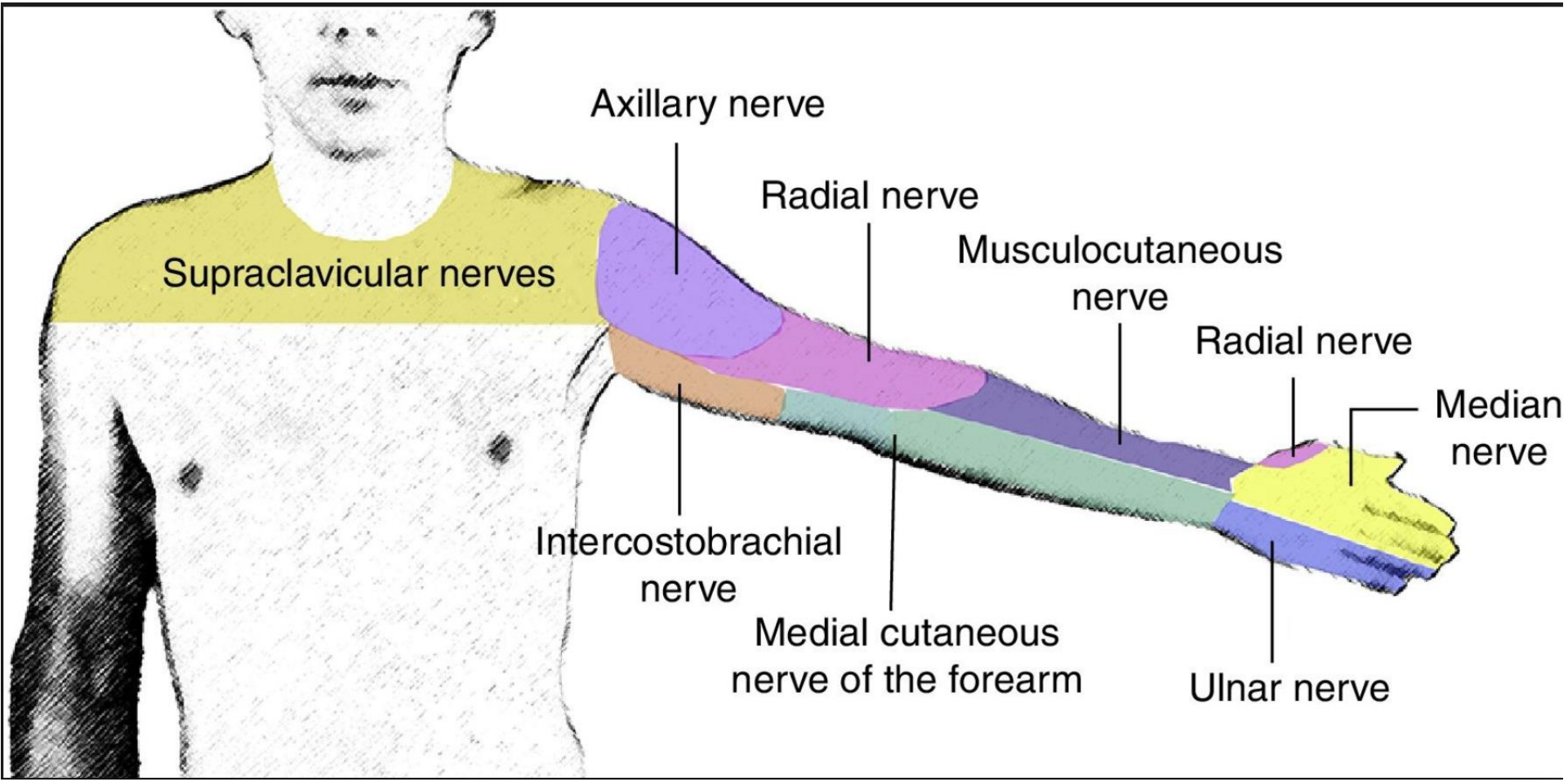
- Interscalene nerve block

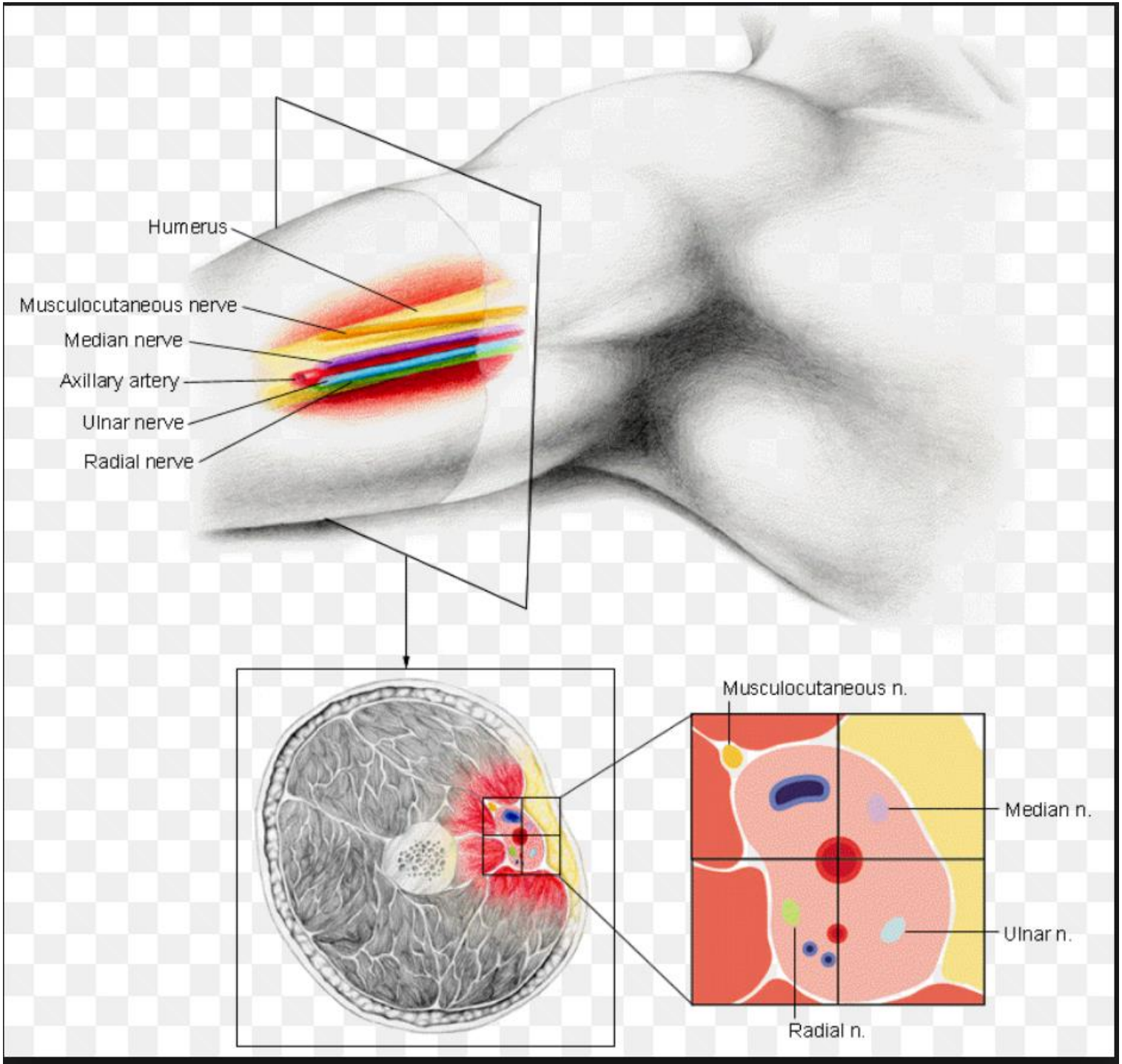


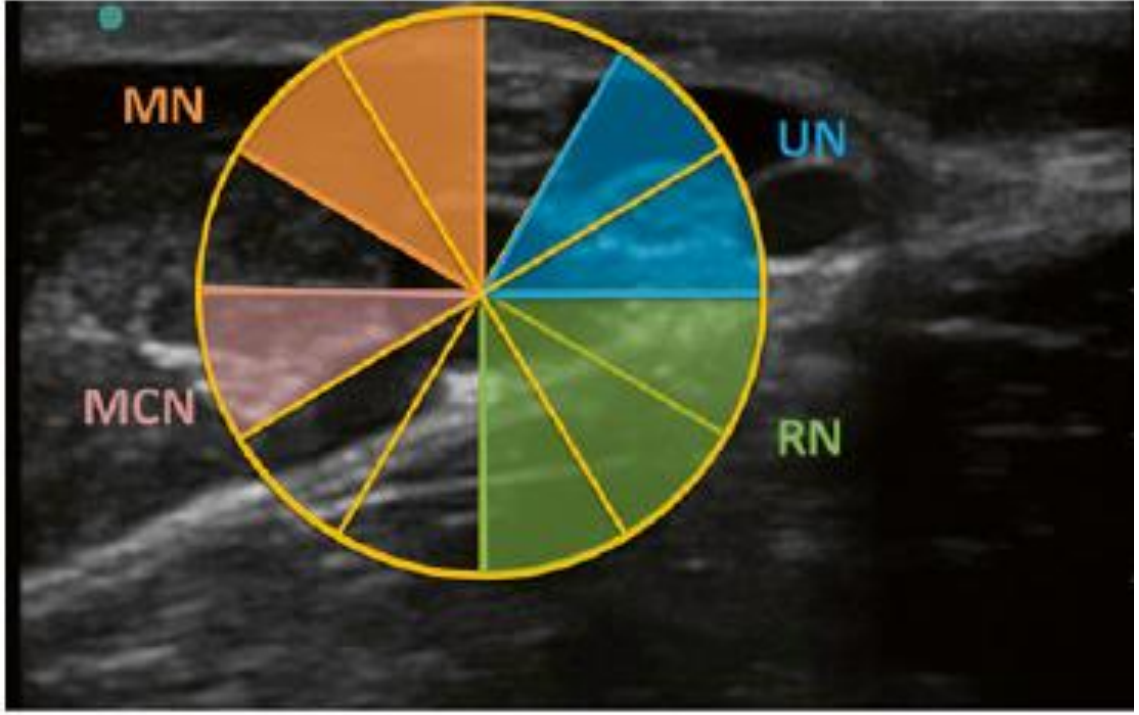
- Axillary nerve block

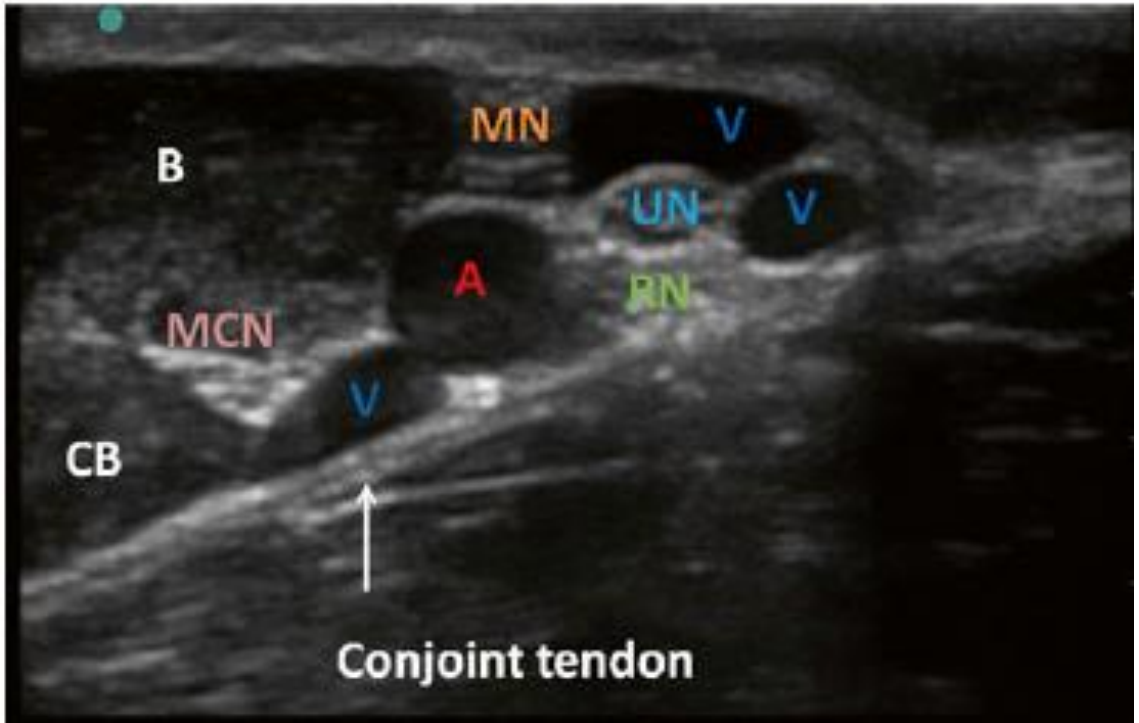




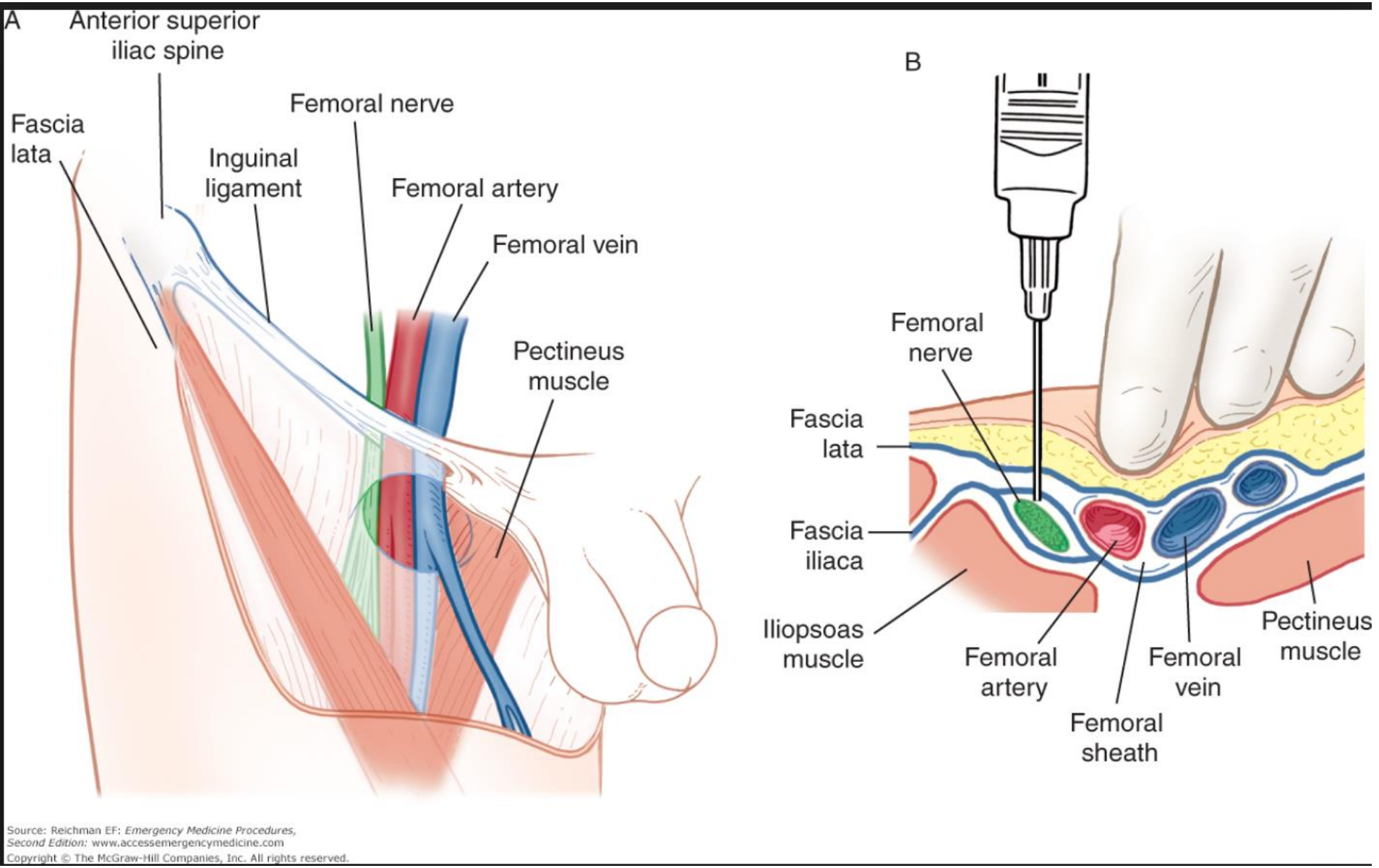

Axillary nerve
Radial nerve
Musculocutaneous nerve
Radial nerve
Median nerve
Supraclavicular nerves
Intercostobrachial nerve
Medial cutaneous nerve of the forearm
Ulnar nerve

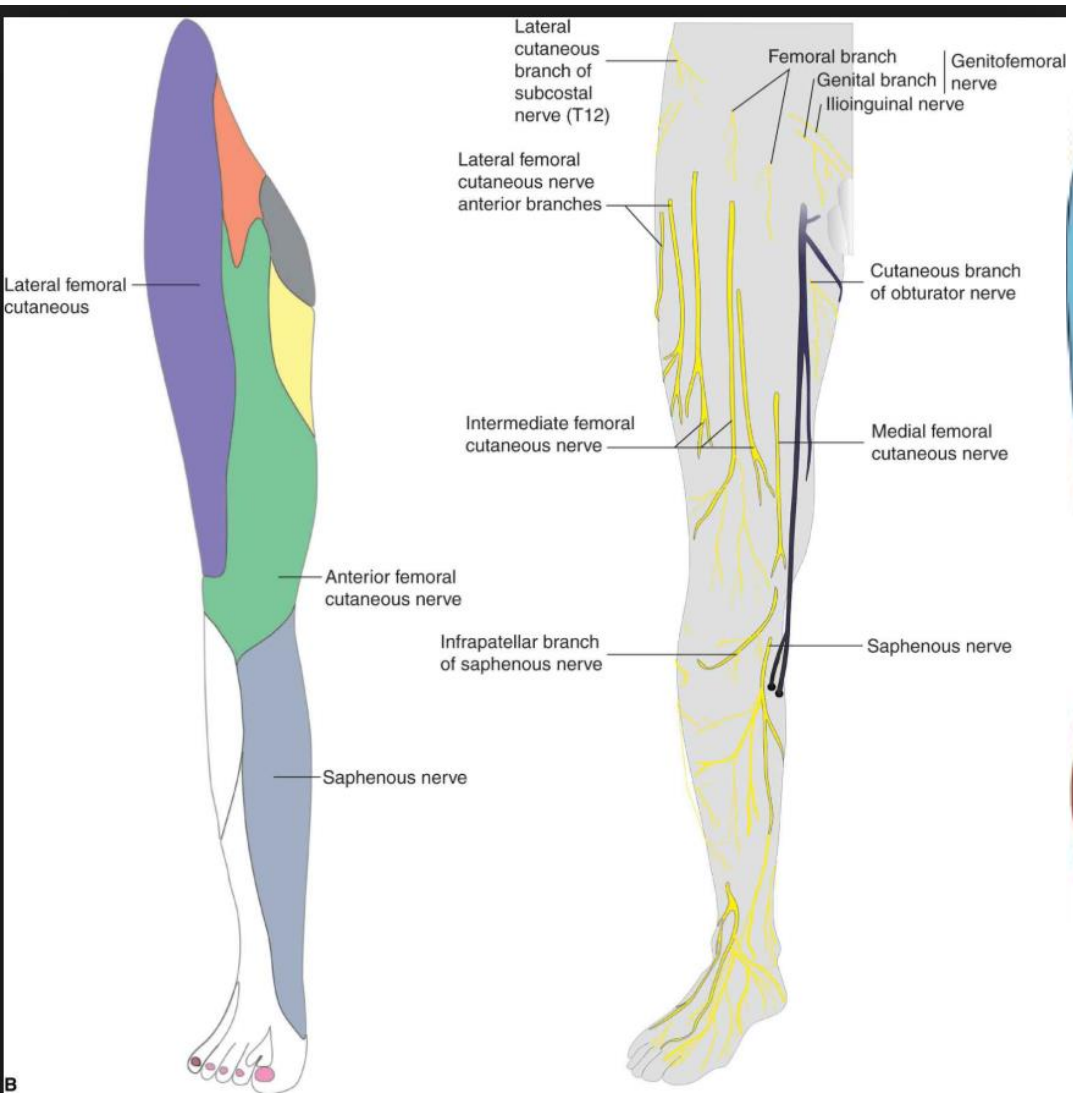

Humerus
Musculocutaneous nerve
Median nerve
Axillary artery
Ulnar nerve
Radial nerve
Musculocutaneous n.
Median n.
Ulnar n.
Radial n.

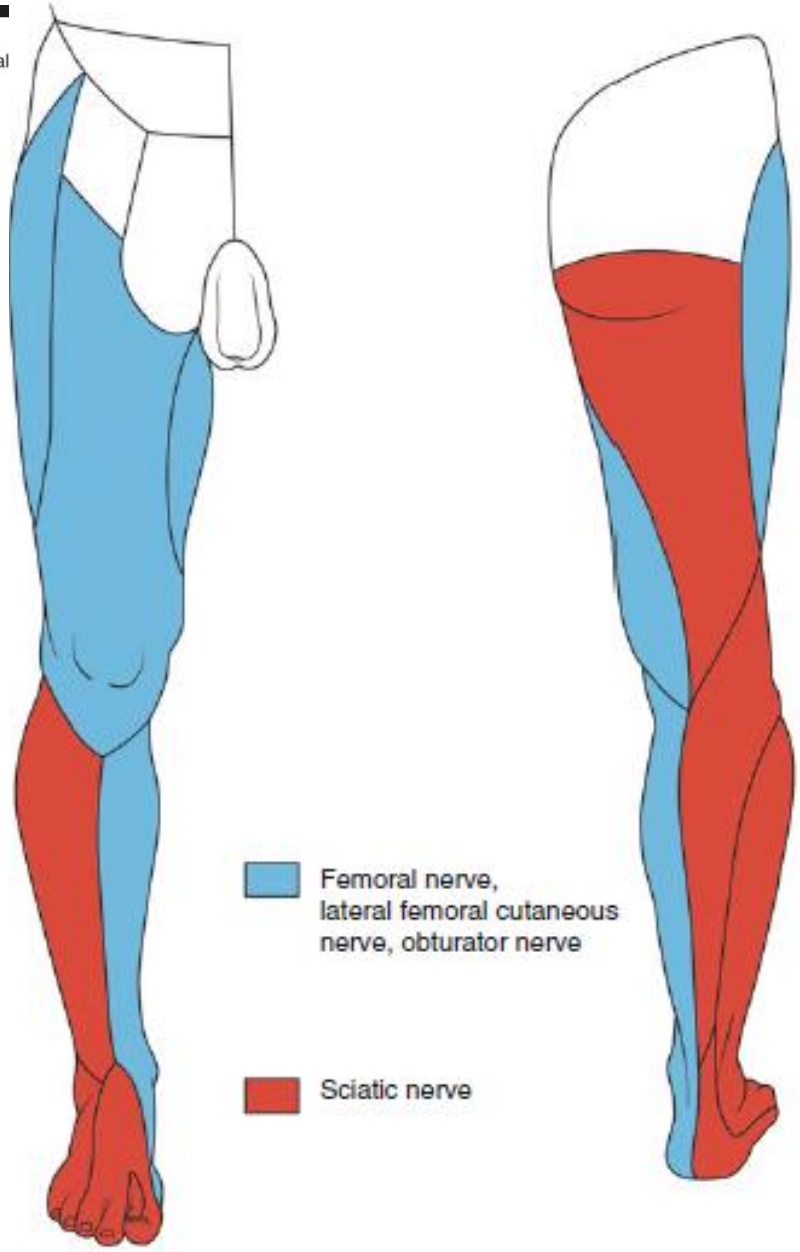

MN
UN
MCN
RN


B
MN
V
UN
V
A
RN
MCN
V
CB
Conjoint tendon

- Femoral nerve block




Lateral cutaneous branch of subcostal nerve (T12)
Femoral branch
Genital branch
Genitofemoral nerve
Ilioinguinal nerve
Lateral femoral cutaneous nerve anterior branches
Lateral femoral cutaneous
Cutaneous branch of obturator nerve
Intermediate femoral cutaneous nerve
Medial femoral cutaneous nerve
Anterior femoral cutaneous nerve
Infrapatellar branch of saphenous nerve
Saphenous nerve
Saphenous nerve
B


Femoral nerve, lateral femoral cutaneous nerve, obturator nerve
Sciatic nerve

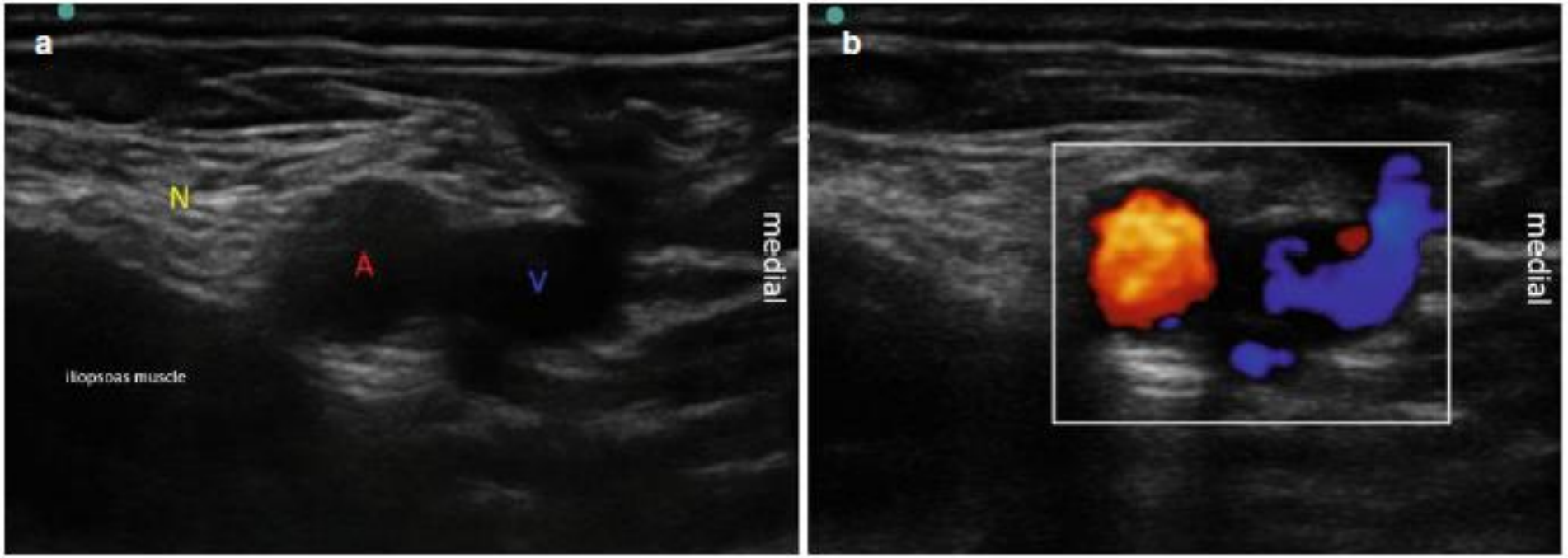


Fig. 59.19 (**a**) Femoral nerve (*N*) in the inguinal crease, femoral artery (*A*), and femoral vein (*V*) as landmarks. (**b**) Color Doppler as a confirmation method (With permission from Jens Kessler)

- Sciatic nerve block

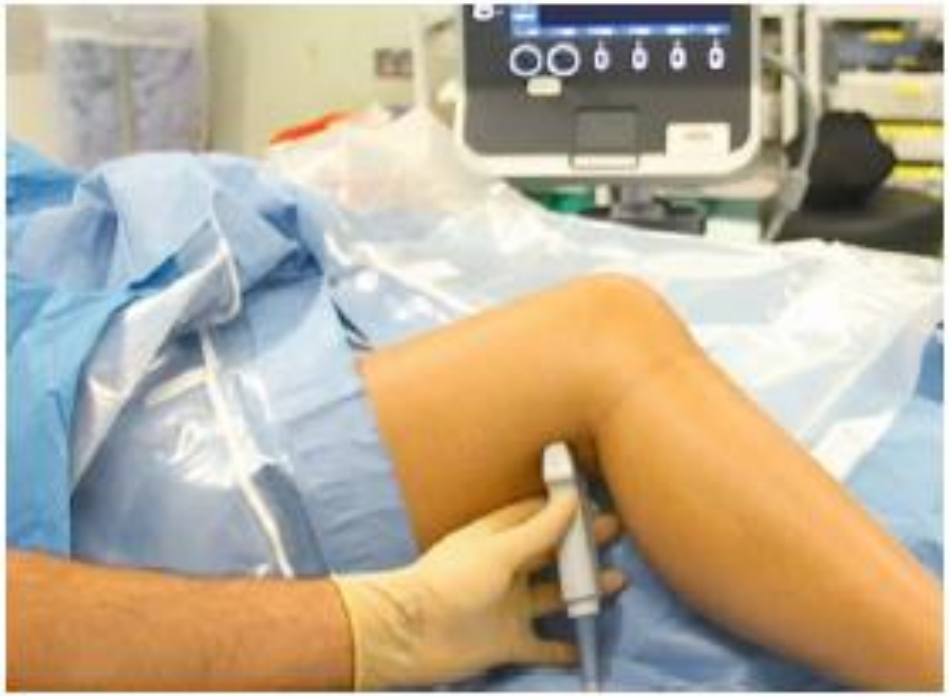


Fig. 62.4 Ultrasound probe position in the popliteal fossa with the patient in the supine position (With permission from Dr. Ki Jinn Chin)

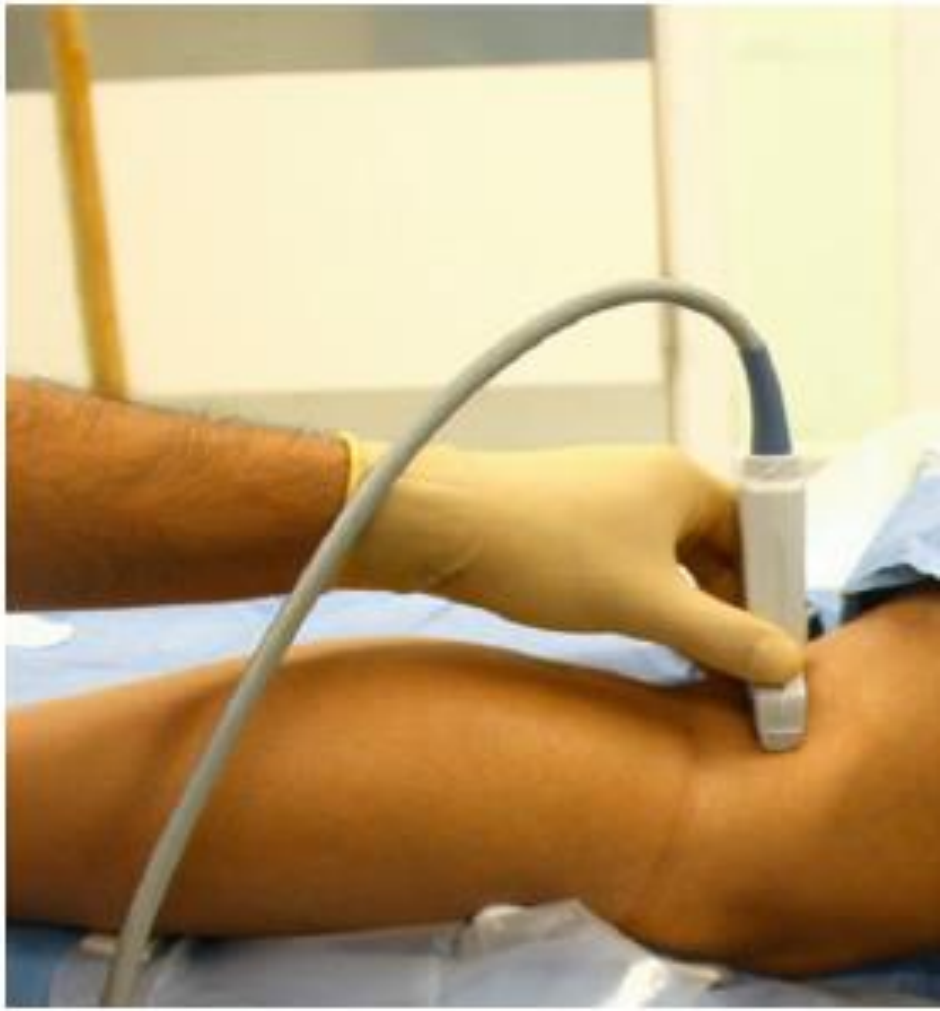
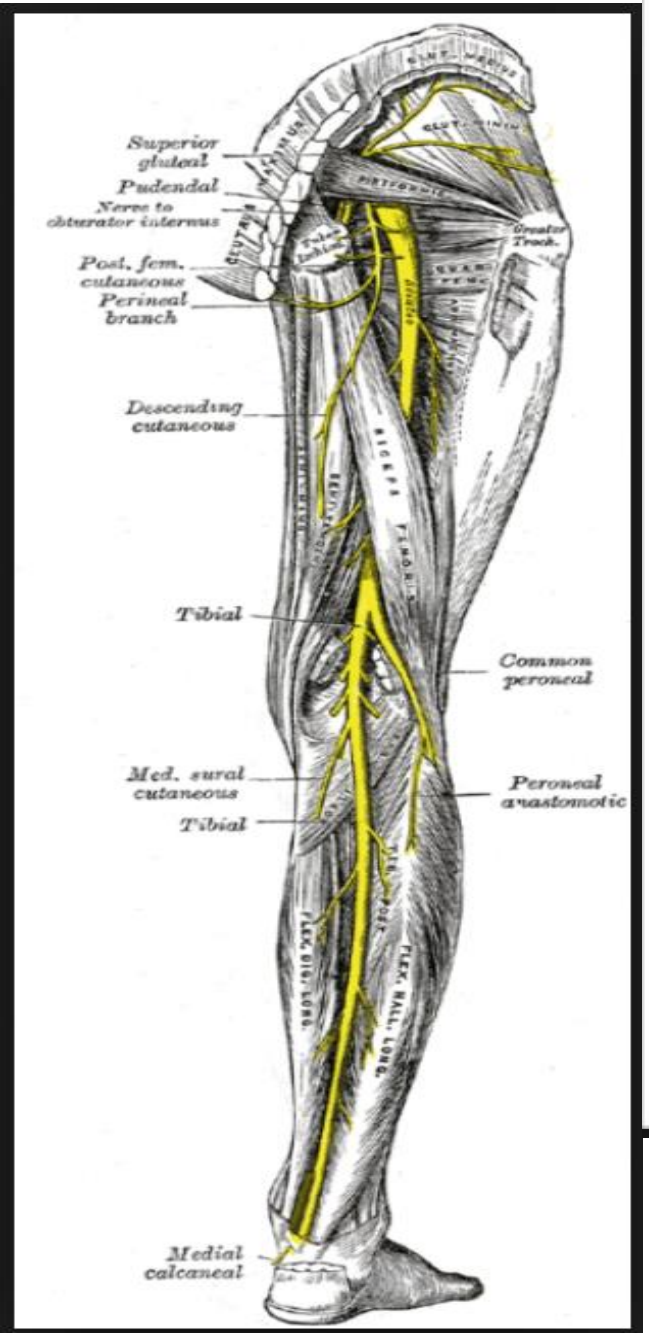
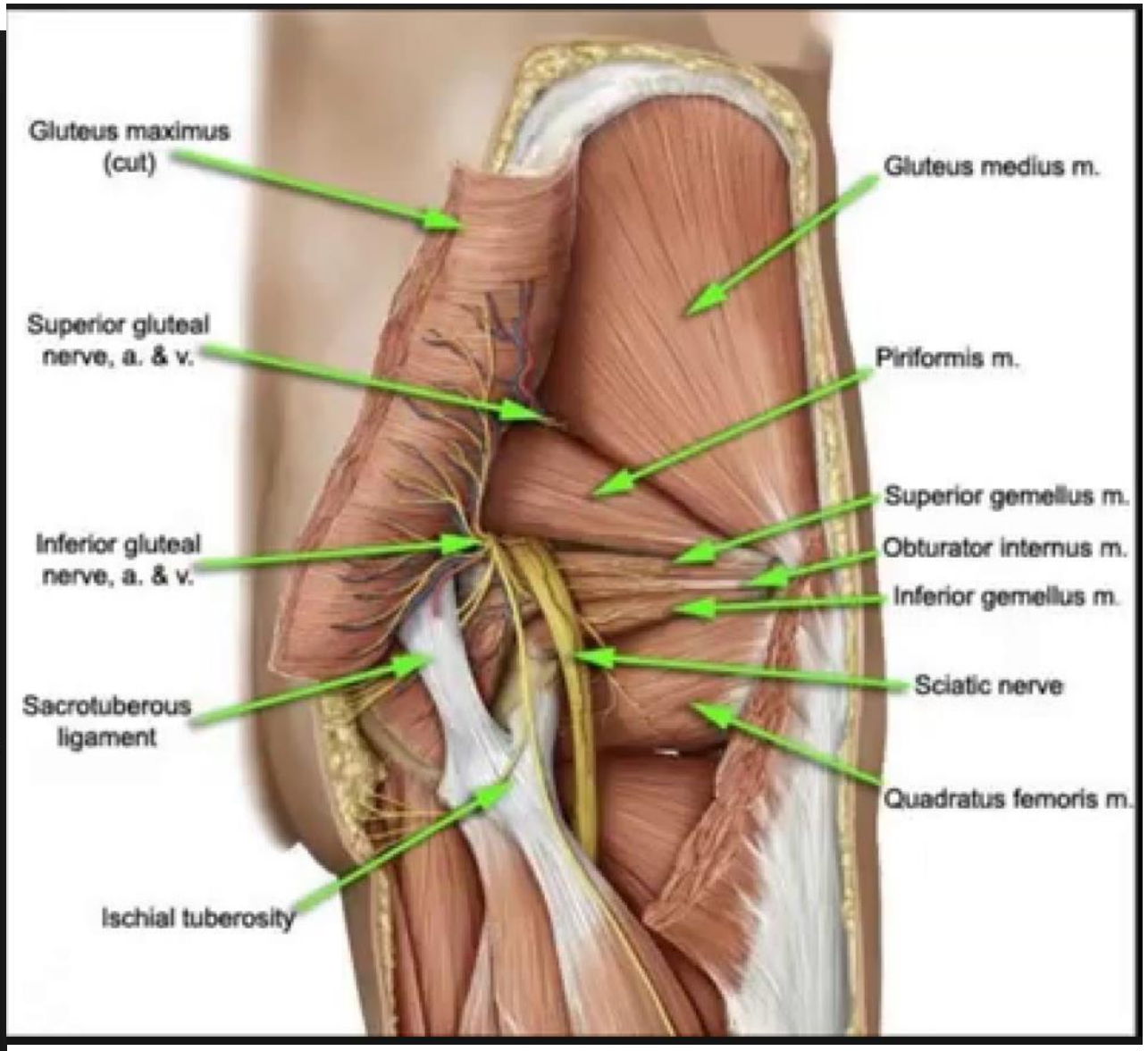
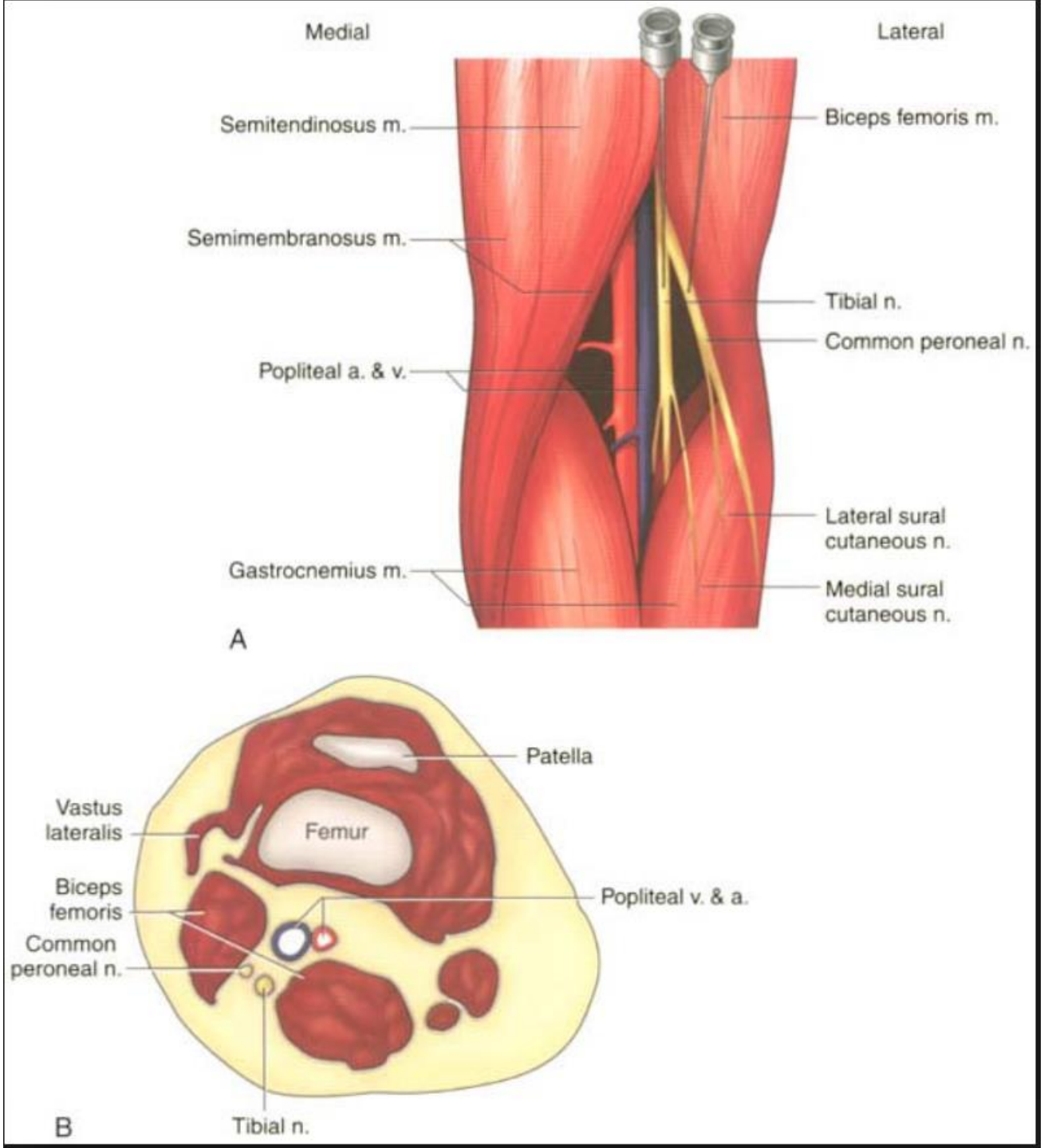


Fig. 62.5 Ultrasound probe position in the popliteal fossa with the patient in the prone position (With permission from Dr. Ki Jinn Chin)


Superior gluteal
Pudendal
Nerve to obturator internus
Post. fem. cutaneous
Perineal branch
Descending cutaneous
Tibial
Common peroneal
Med. sural cutaneous
Peroneal anastomotic
Tibial
Medial calcaneal


Gluteus maximus (cut)
Gluteus medius m.
Superior gluteal nerve, a. & v.
Piriformis m.
Superior gemellus m.
Inferior gluteal nerve, a. & v.
Obturator internus m.
Inferior gemellus m.
Sciatic nerve
Sacrotuberous ligament
Quadratus femoris m.
Ischial tuberosity


Medial
Lateral
Semitendinosus m.
Biceps femoris m.
Semimembranosus m.
Tibial n.
Common peroneal n.
Popliteal a. & v.
Lateral sural cutaneous n.
Gastrocnemius m.
Medial sural cutaneous n.
A
Patella
Vastus lateralis
Femur
Biceps femoris
Popliteal v. & a.
Common peroneal n.
Tibial n.
B

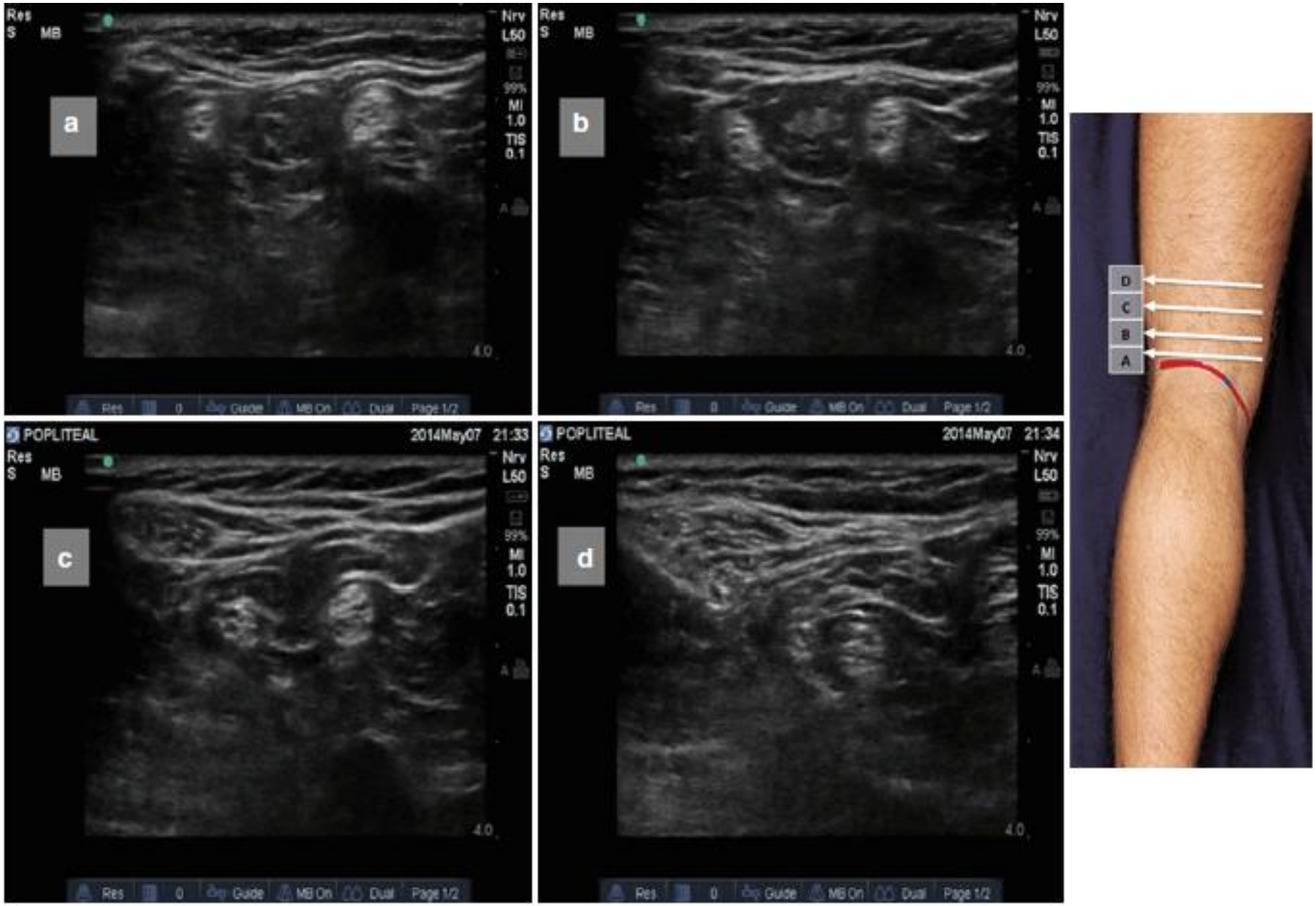
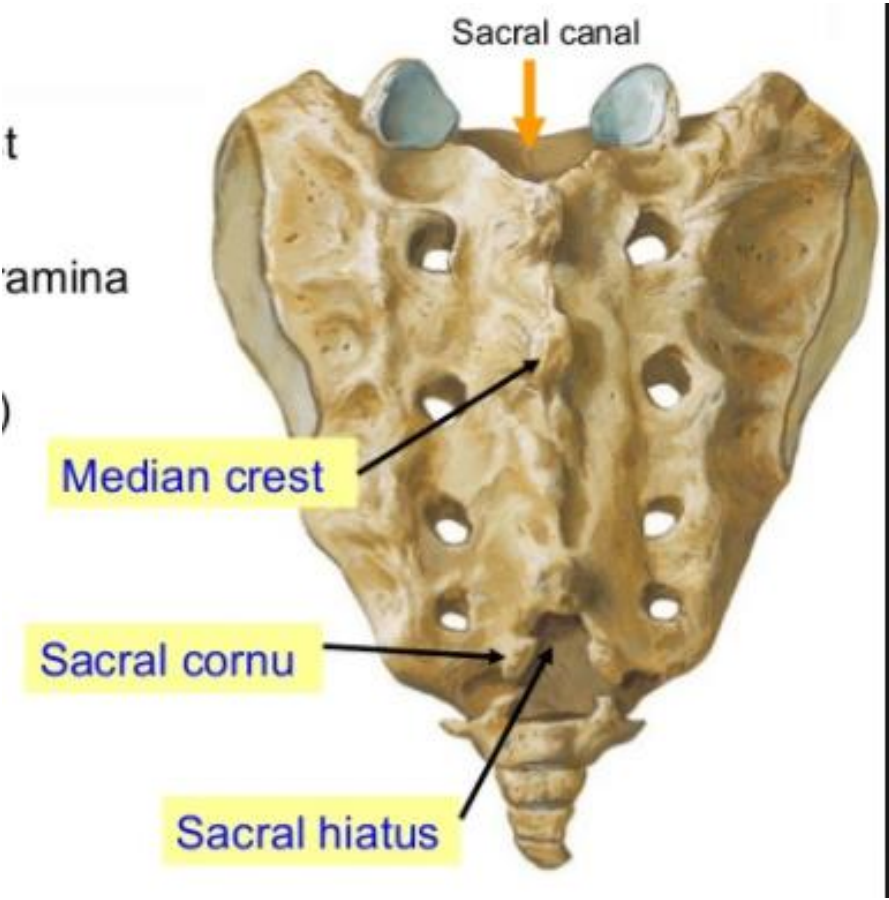
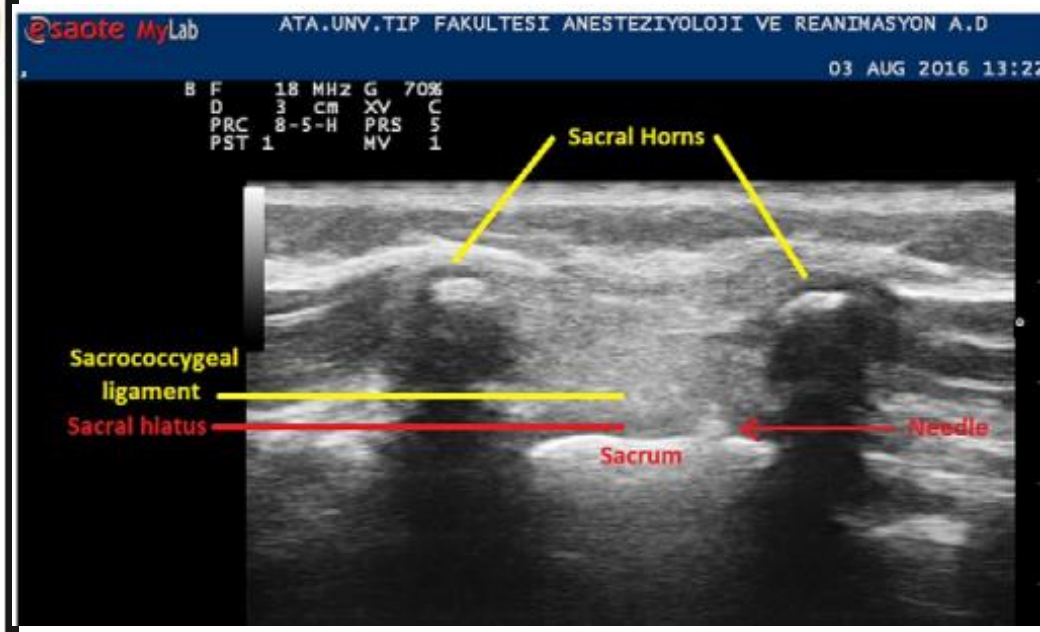


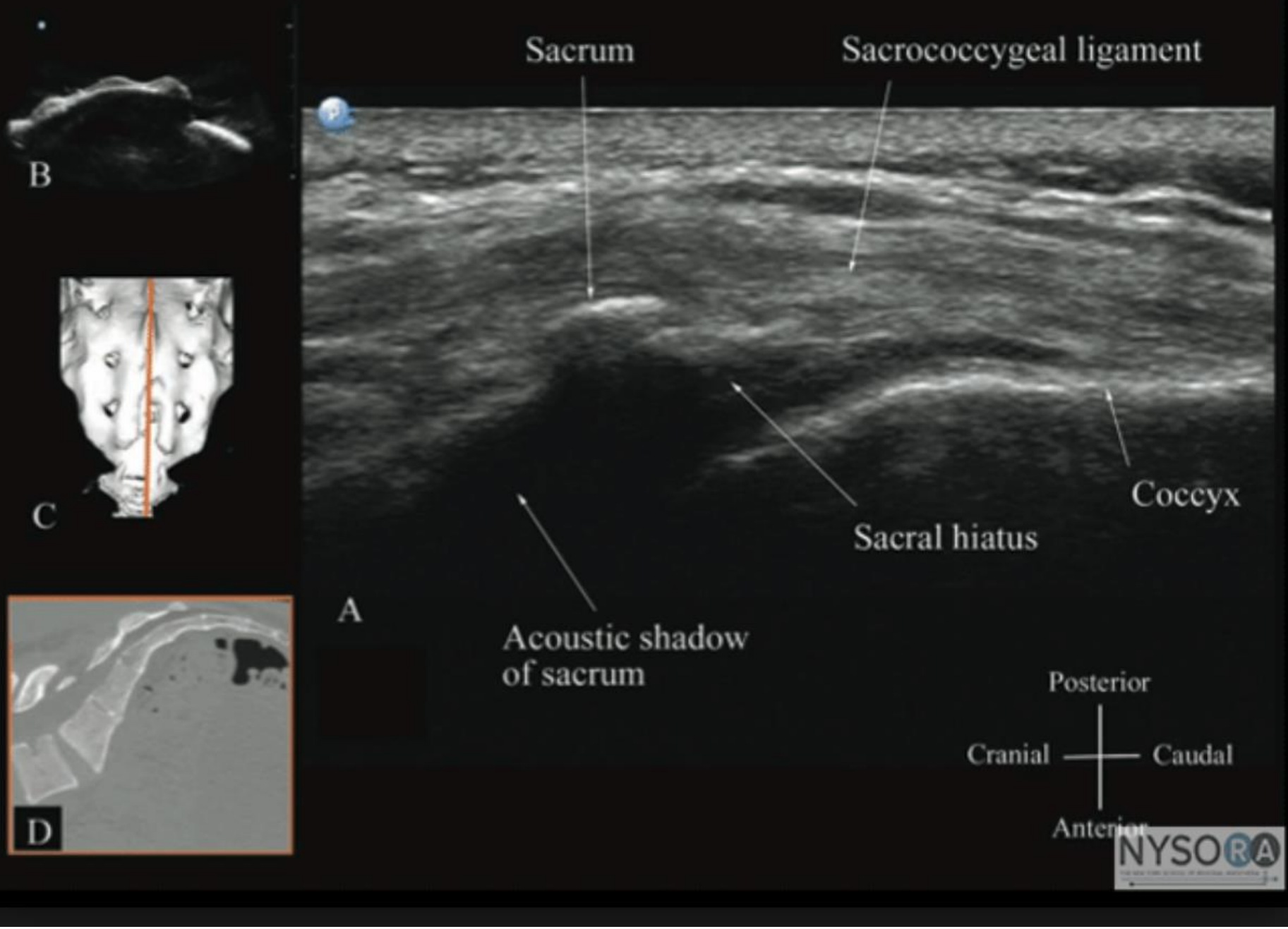
Fig. 62.8 Scanning the sciatic nerve in the popliteal fossa from distal to proximal using the traceback method. The positions of the ultrasound in Figs. **a** to **d** correspond to the positions indicated in the figure on the right side. The tibial nerve (nerve on the *right side*) and common peroneal nerve (nerve on the *left side*) of the sciatic nerve will be seen to approach each other and join within a common sheath (With permission from Dr. Ki Jinn Chin)

- Caudal nerve block

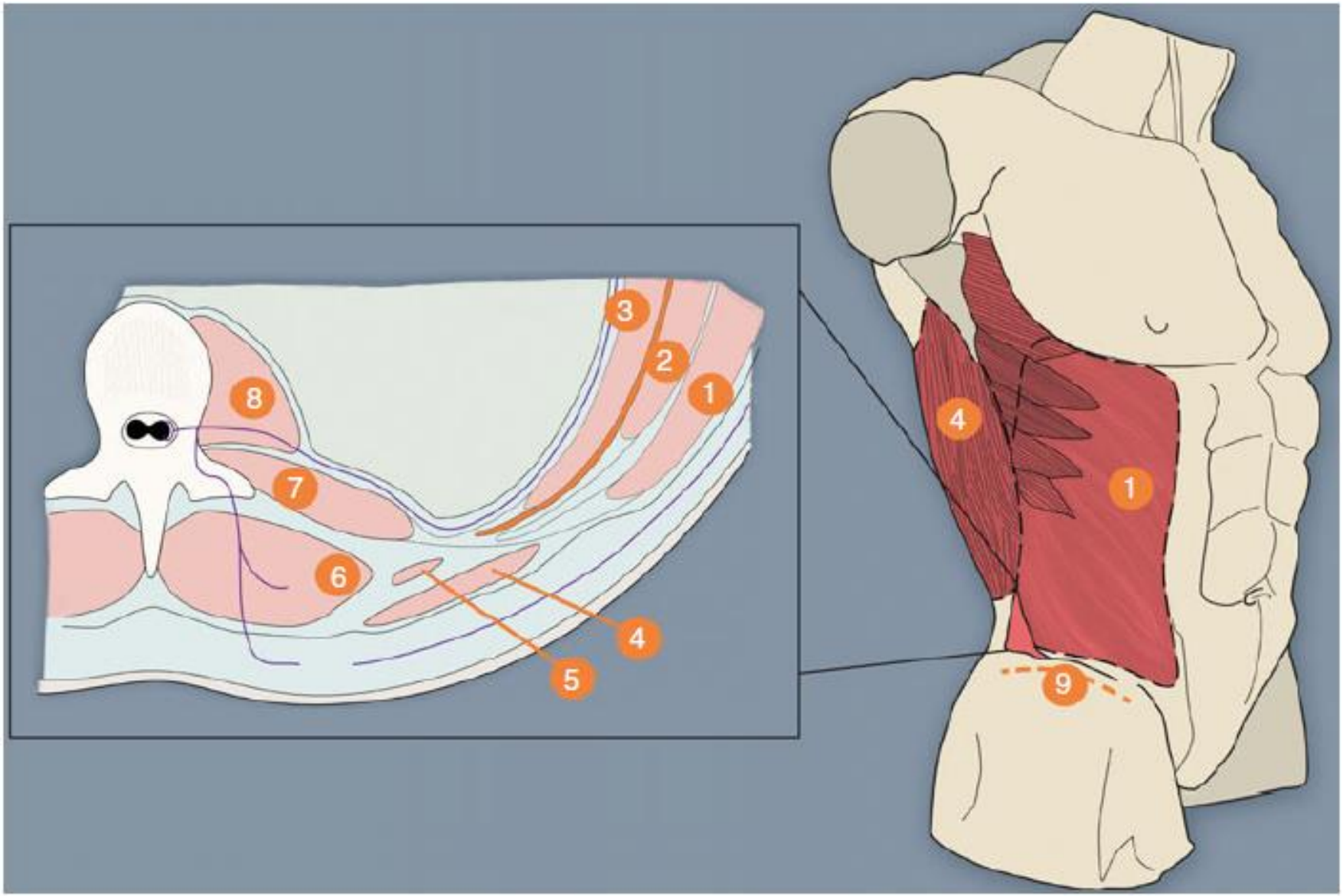
- Chronic low back pain, urogenital surgery



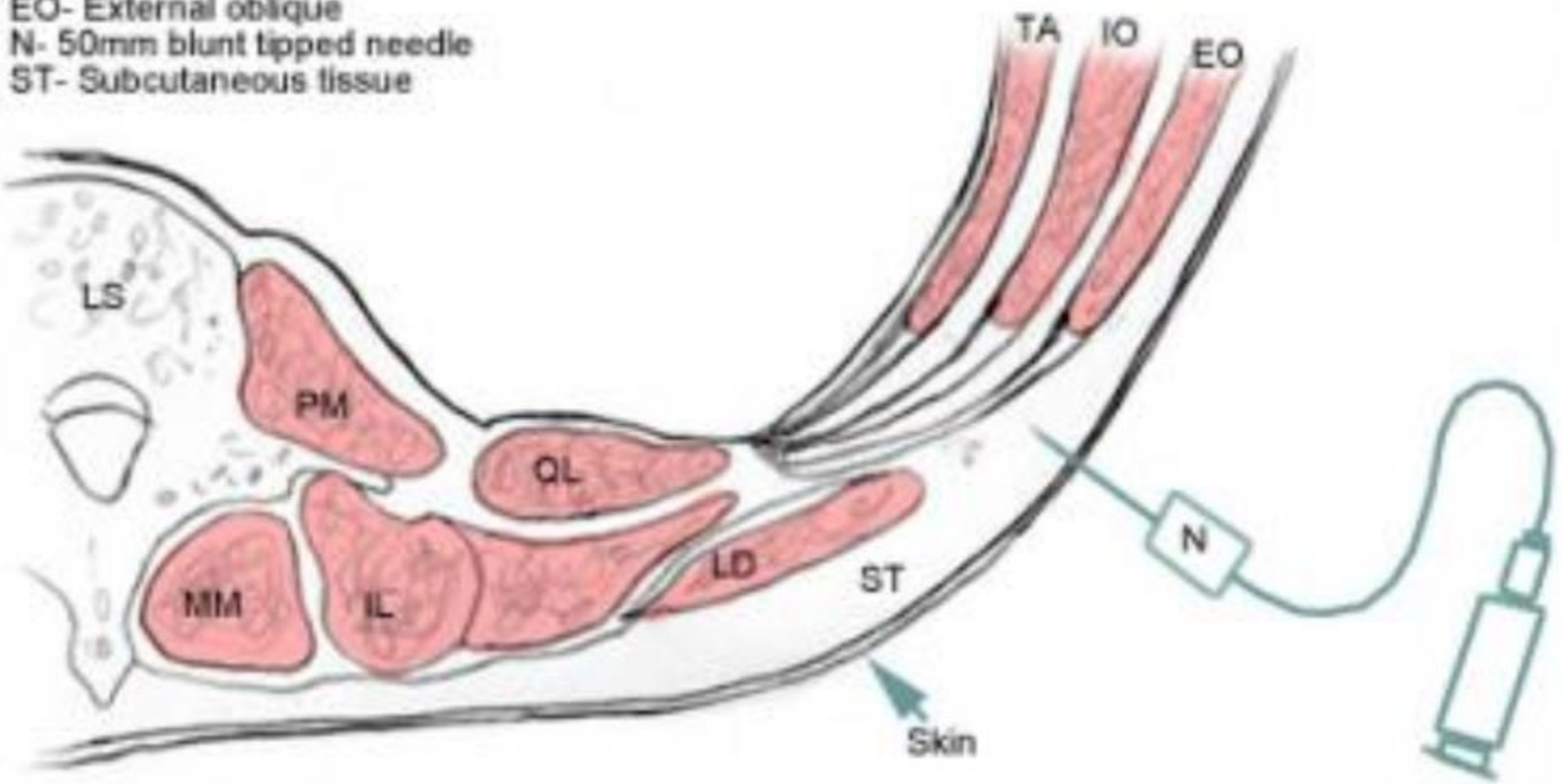


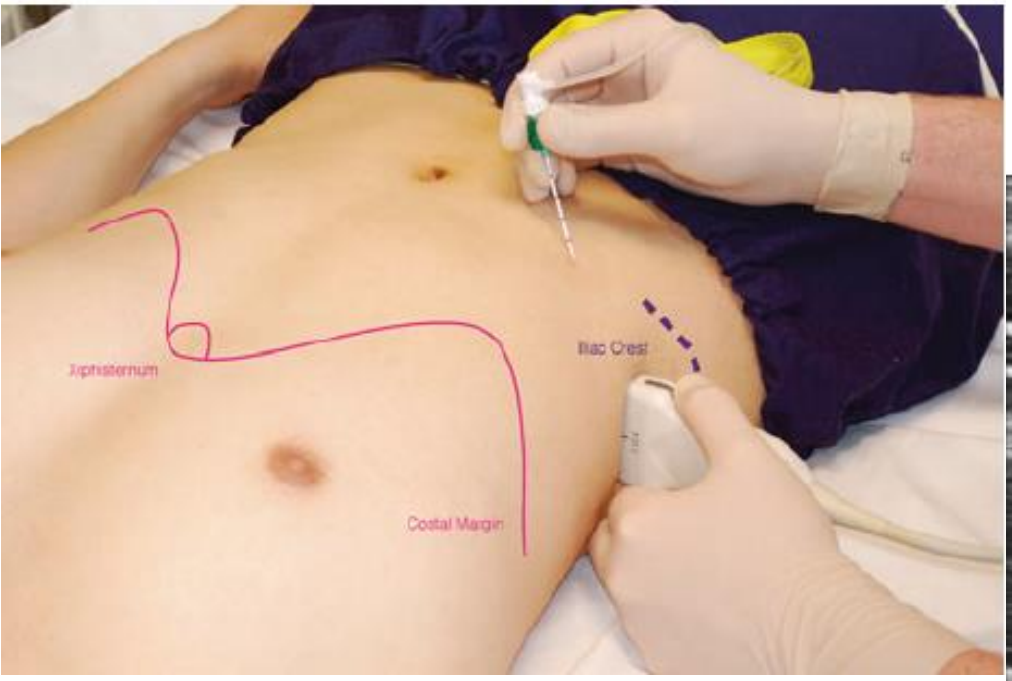

Sacrum
Sacrococcygeal ligament
B
C
D
A
Coccyx
Sacral hiatus
Acoustic shadow
of sacrum
Posterior
Cranial
Caudal
Anterior
NYSORA

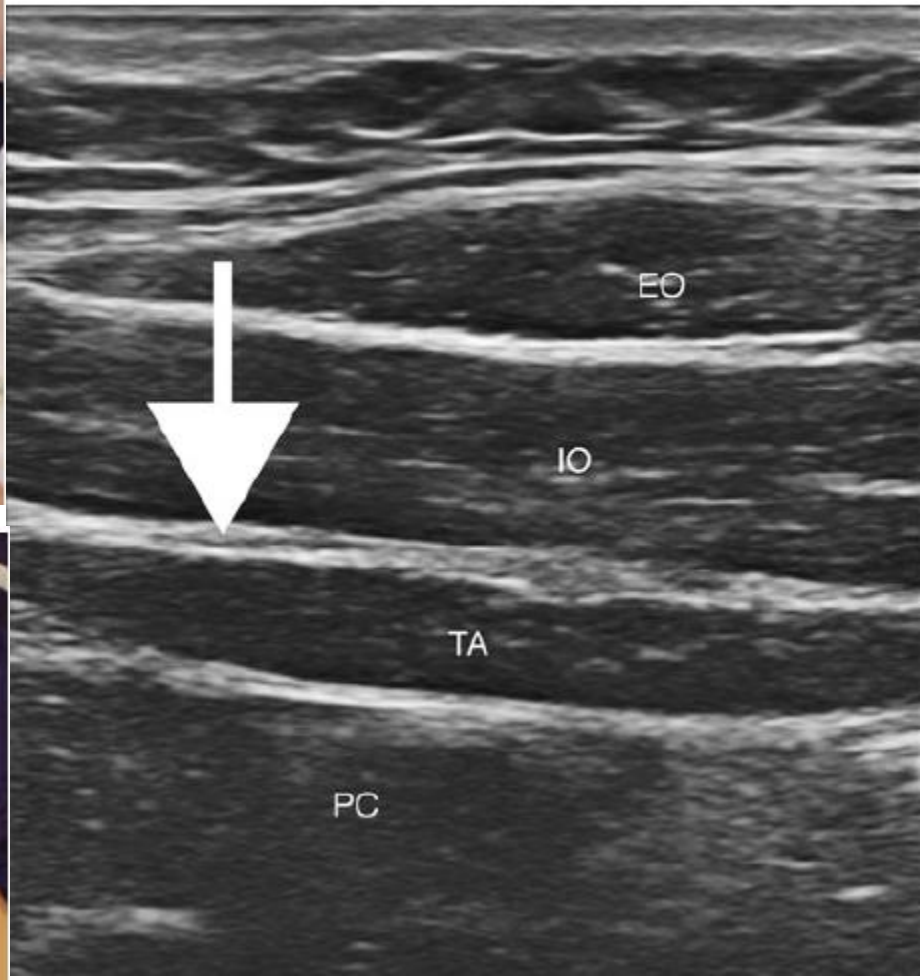
- Transversus abdominis plane block

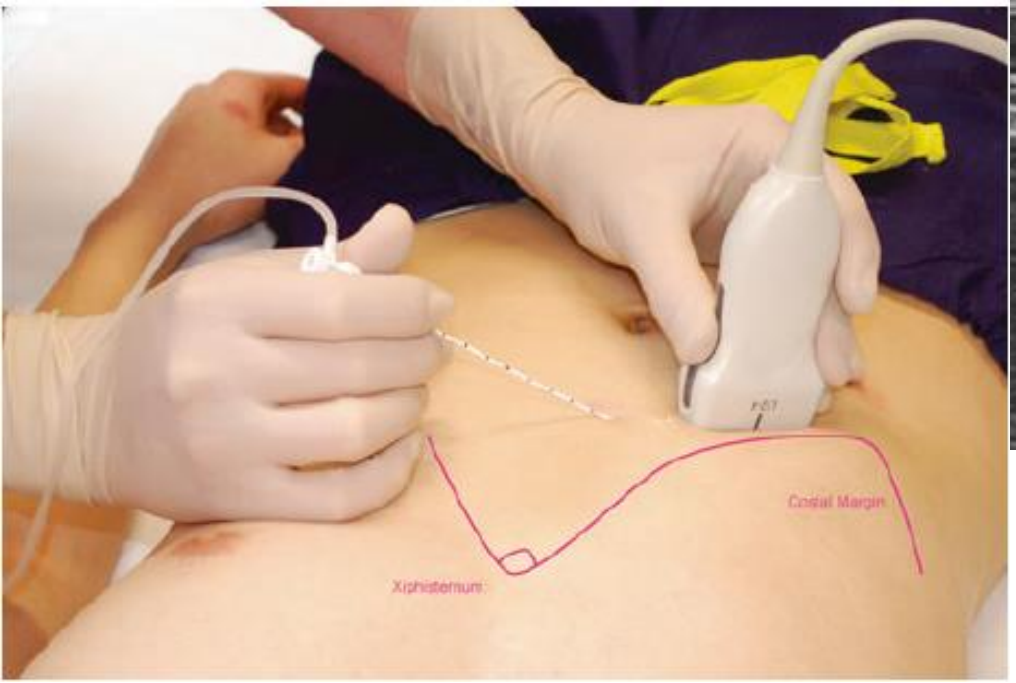


LS- Lumbar spine
LD- Latissimus dorsi
PM- Psoas major
QL- Quadratus lumborum
MM- Mulitfidus muscle
IL- Longissimus, Iliocostalis
TA- Transversus abdominis
IO- Internal oblique
EO- External oblique
N- 50mm blunt tipped needle
ST- Subcutaneous tissue




Xiphisternum
Iliac Crest
Costal Margin


EO
IO
TA
PC


Costal Margin
Xiphisternum

- Quadratus lumborum block

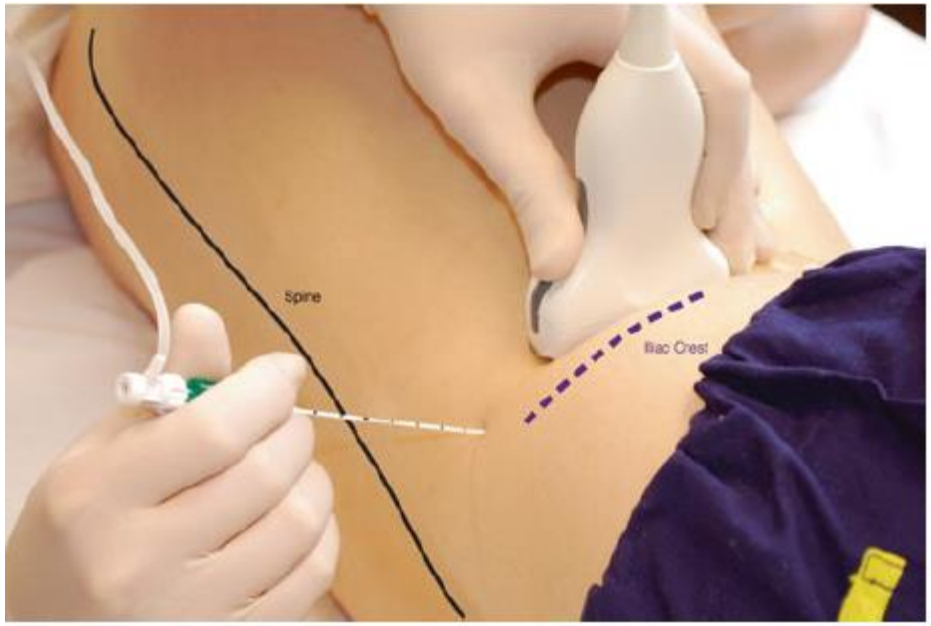


Fig. 53.13 Injection technique for quadratus lumborum block. Spine (*black line*), iliac crest (*purple-dotted line*)

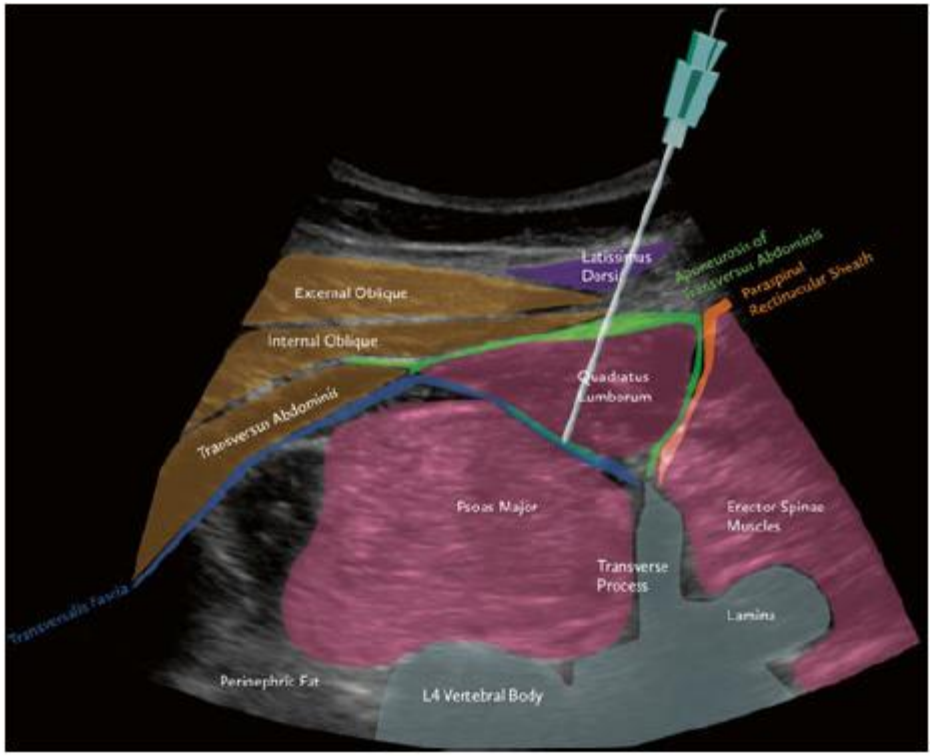


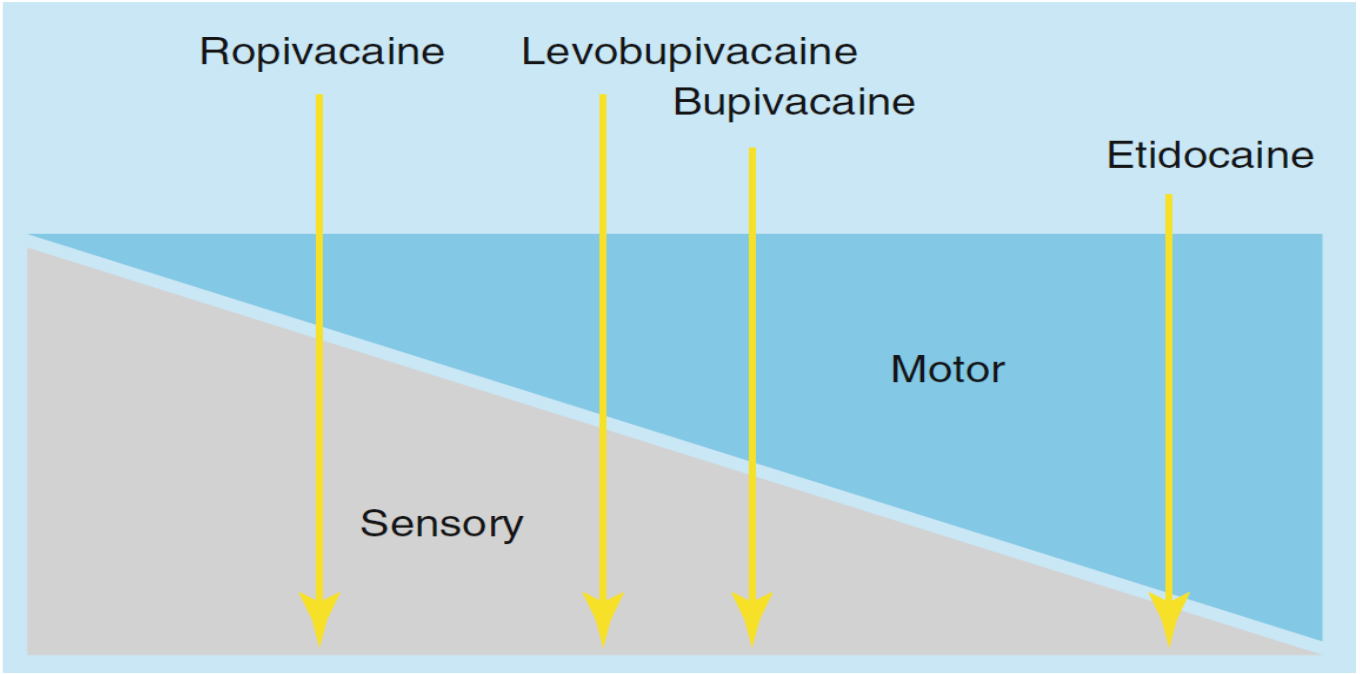
Fig. 53.14 Target site for deposition of local anesthetic under ultrasound guidance for transmuscular approach to quadratus lumborum block. Note the deposition of local anesthetic between quadratus lumborum and psoas major, above the transversalis fascia

Complication of nerve block

- Toxicity

- Direct neurotoxicity: concentration-dependent
- Paralysis, cauda equina syndrome

Table 1.5 Relative block profile of long-acting local anesthetics



mild

severe

- Local anesthetics systemic toxicity (LAST)
- CNS: 舌麻, 耳鳴, 金屬味覺, 焦慮, 顫抖, 嘔吐
  語無倫次, 步態不穩, 嗜睡, 痙攣
  coma, 呼吸抑制, 癱軟, 失禁, 死亡
- Cardiovascular: palpitation, tachycardia
  arrhythmia, nausea, pallor
  bradycardia, BP drop, VT,
  asystole

Table 1.7 Symptoms of intoxication due to local anesthetics

Central nervous system	Cardiovascular system
Stimulation phase, mild intoxication	
Tingling of lips, tongue paresthesias, perioral numbness, ringing in the ears, metallic taste, anxiety, restlessness, trembling, muscle twitching, vomiting	Cardiac palpitation, hypertonia, tachycardia, tachypnea, dry mouth
Stimulation phase, moderately severe intoxication	
Excitation phase, moderate toxicity Speech disturbance, dazed state, sleepiness, confusion, tremor, choreoid movements, tonic-clonic cramp, mydriasis, vomiting, polypnea	Tachycardia, arrhythmia, cyanosis and pallor, nausea and vomiting
Paralytic phase, severe toxicity	
Stupor, coma, irregular breathing, respiratory arrest, flaccidity, vomiting with aspiration, sphincter paralysis, death	Severe cyanosis, bradycardia, drop in blood pressure, primary heart failure, ventricular fibrillation, hyposystole, asystole