

Fascial Plane Blocks



Fascial Plane Nerve Blocks

I. Benefits

- A. Provides regional anesthesia options
- B. Can be done for outpatients
- C. Coagulation status not an issue
- D. Catheters are an option
- E. Lacks the side effects of epidurals
 - i. Hypotension
 - ii. Advanced post-op nursing care

I. Absolute Contraindications

- A. Patient refusal
- B. Allergy
- C. Infection at injection site

Anatomical Basis of Fascial Plane Blocks

- I. “Fascial plane blocks are regional anesthesia techniques in which the space (“plane”) between two discrete fascial layers is the target of needle insertion and injection”
 - A. “Fascial plane blocks are regional anesthesia techniques in which local anesthetic is injected into the space (“plane”) between two layers of fascia rather than attempting to locate a specific nerve or plexus”

Anatomical Basis of Fascial Plane Blocks

- I. “Analgesia is primarily achieved by local anesthetic spread to nerves traveling within this plane and adjacent tissues”
 - A. “The main aim is to produce conduction block of nerves that traverse fascial planes and compartments. Local anesthetic reaches these nerves, which may be relatively distant from the injection site, by a combination of bulk flow (particle movement along a pressure gradient) and diffusion (solute dispersion along a concentration gradient). There may also be a secondary effect resulting from systemic absorption of local anesthetic.”

Anatomical Basis of Fascial Plane Blocks

- I. “Fascia is a sheath, a sheet, or any other dissectible aggregations of connective tissue that attach, enclose, and separate muscles and other internal organs”
 - A. “Fascia can be classified as superficial, deep, or visceral”
 - B. “Deep fascia is the denser layer that invests musculoskeletal structures, and is most pertinent to the performance of FPBs”
 - C. “Fascia is permeable to molecules in aqueous solution”
 - D. “The exact composition and thickness of fascia varies depending on its location and function”
 - E. “The demarcations between fascial entities are not always clear-cut”
 - i. “It is not unusual to see multiple fascial separations open up during ultrasound-guided hydro dissection”

Anatomical Basis of Fascial Plane Blocks

- I. Somatic pain – Musculoskeletal
 - A. Pain nerves
 - B. Motor nerves
- II. Visceral pain – Internal organs
 - A. Shares pathway with sympathetic nerve fibers
 - i. Not transmitted by sympathetic nerve fibers
 - B. Paravertebral space

Standardizing nomenclature in regional anesthesia: an ASRA-ESRA Delphi consensus study of abdominal wall, paraspinal, and chest wall blocks

I. Paraspinal

- A. Erector Spinae Plane
 - i. Cervical, thoracic, lumbar, and sacral
- B. Paravertebral
- C. Intertransverse process
- D. Retrolaminar

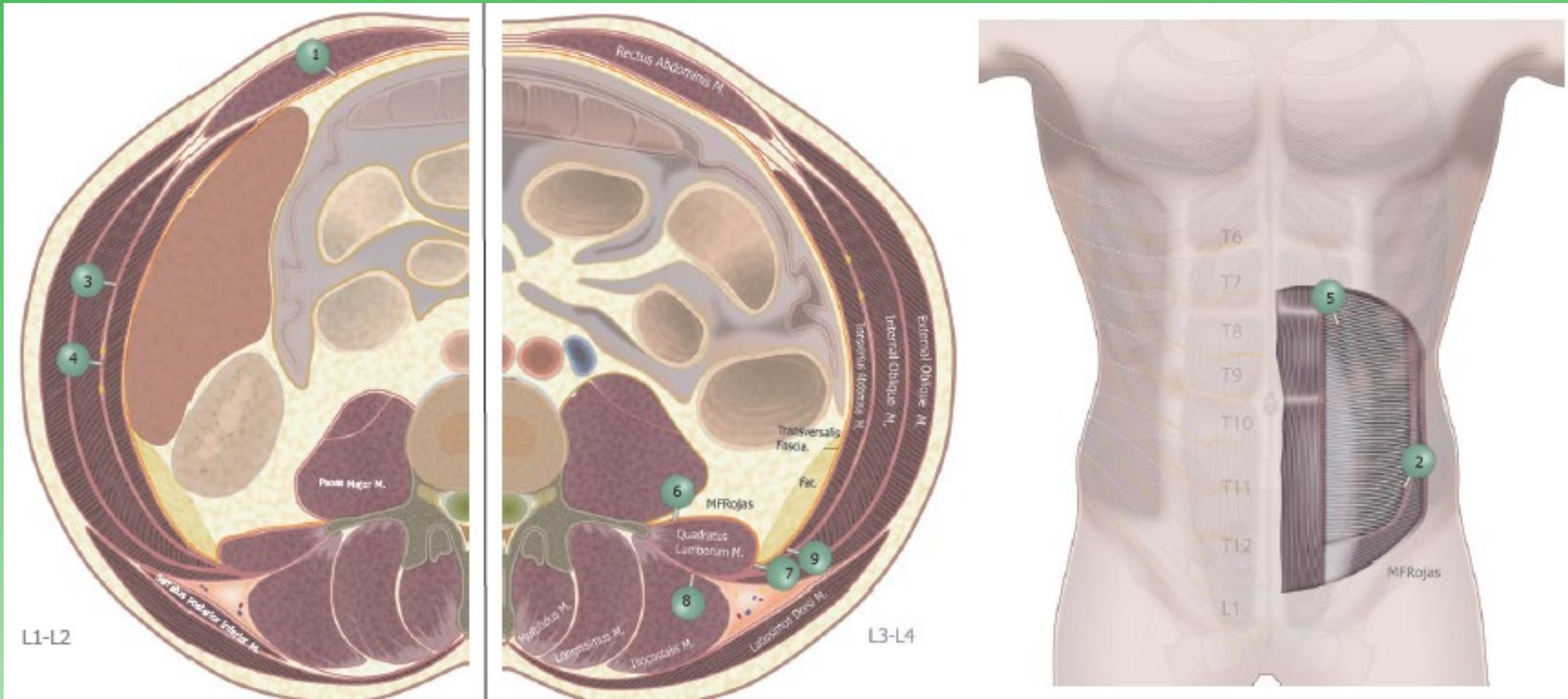
II. Thoracic

- A. Interpectoral Plane/Pectoserratus Plane
- B. Serratus Anterior Plane
 - i. Superficial and Deep
- C. Parasternal Intercostal Plane
 - i. Superficial and Deep

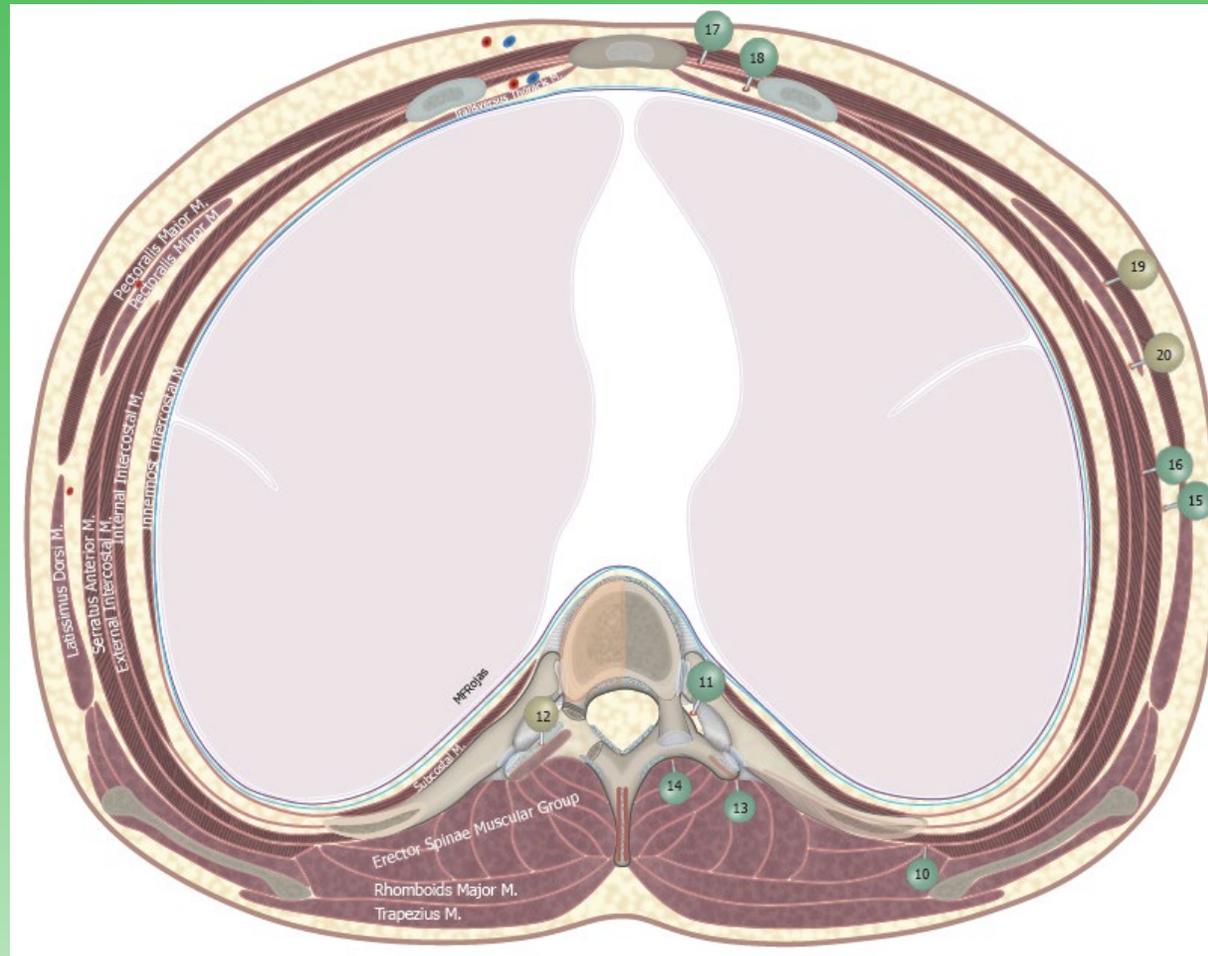
I. Abdominal

- A. Transversus Abdominal Plane
 - i. Unspecified, Midaxillary, Subcostal
- B. Ilioinguinal Iliohypogastric
- C. Transversalis Fascia Plane
- D. Rectus Sheath
- E. Quadratus Lumborum
 - i. Anterior, Lateral, Posterior
- F. Rhomboid Intercostal Plane

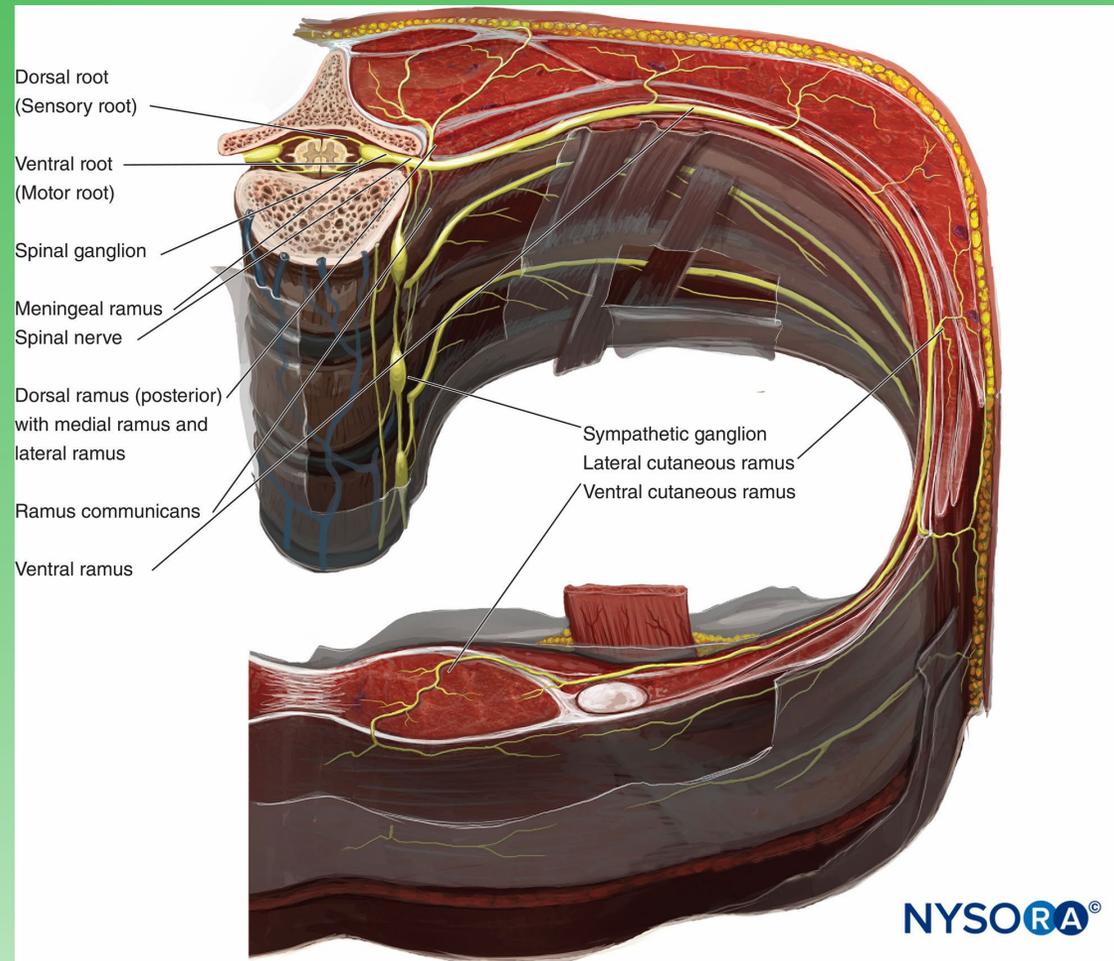
Standardizing Nomenclature



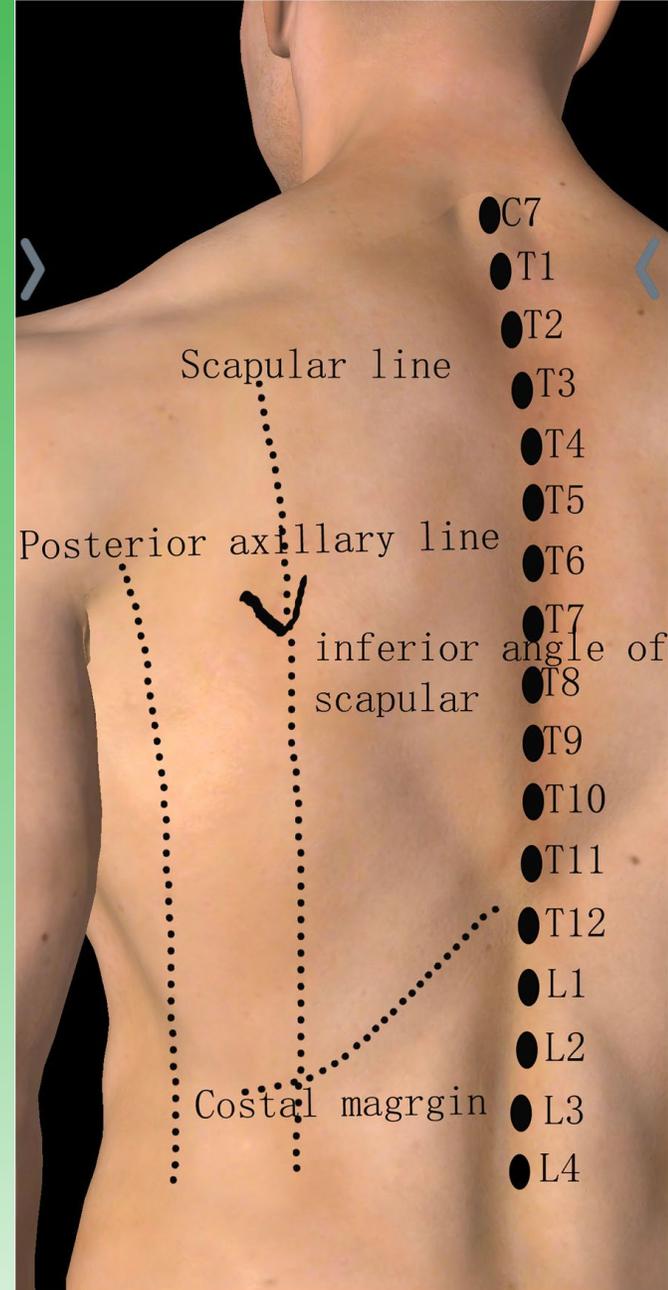
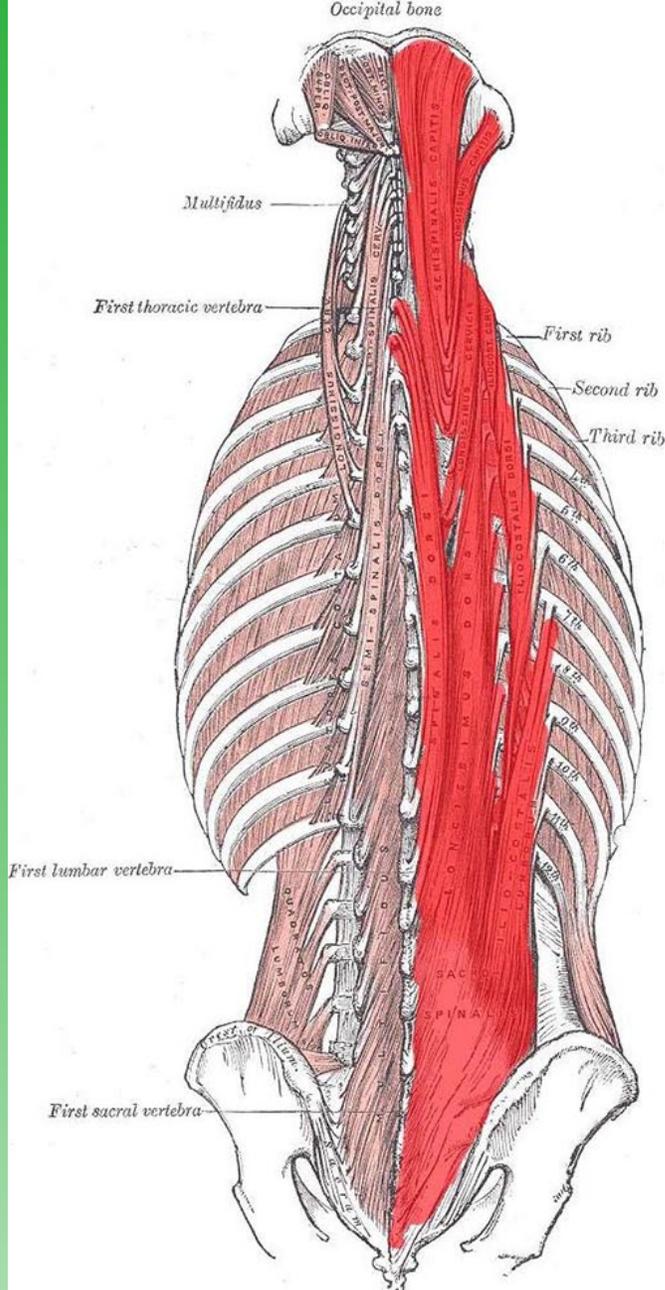
Standardizing Nomenclature



Truncal Nerve Anatomy



Erector Spinae



Erector Spinae indications

I. Thoracic

A. T1

- i. Cervical Spine
- ii. Upper Limb

B. T3-T5

- i. Breast
- ii. Heart/Lung
- iii. Thoracic Spine

C. T7

- i. Lap Chole
- ii. Lap Gastric Bypass
- iii. Liver Resection

A. T10

- i. Colon
- ii. Nephrectomy

I. Lumbar

A. L1

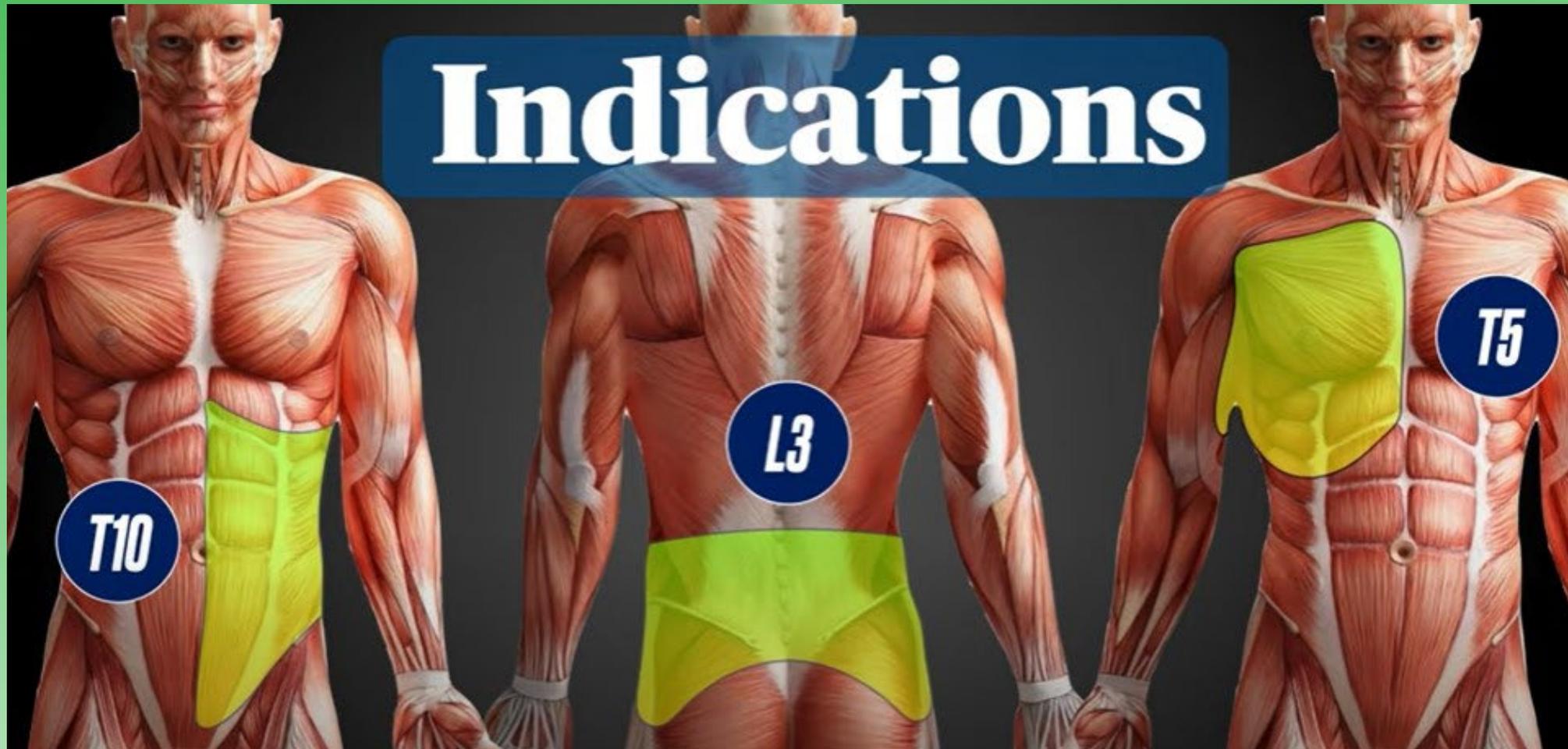
- i. Lumbar spine
- ii. Hip

II. Sacral

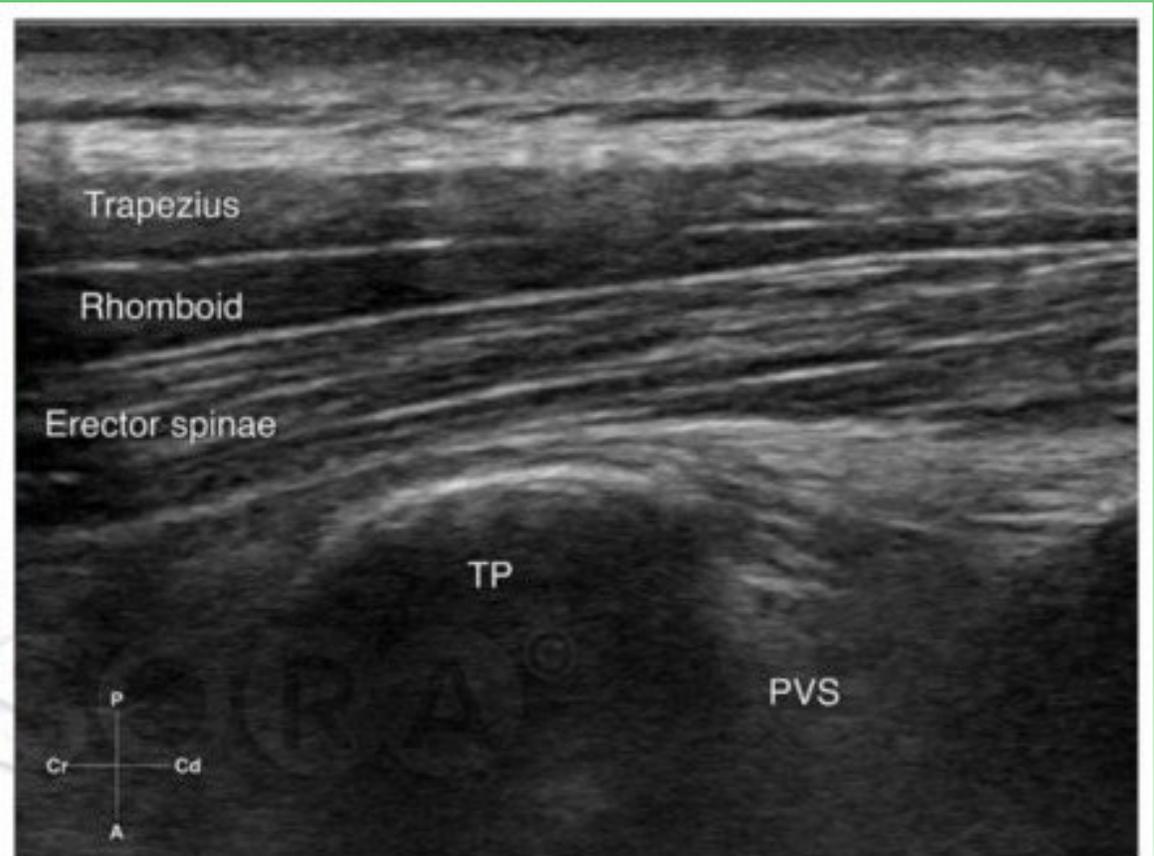
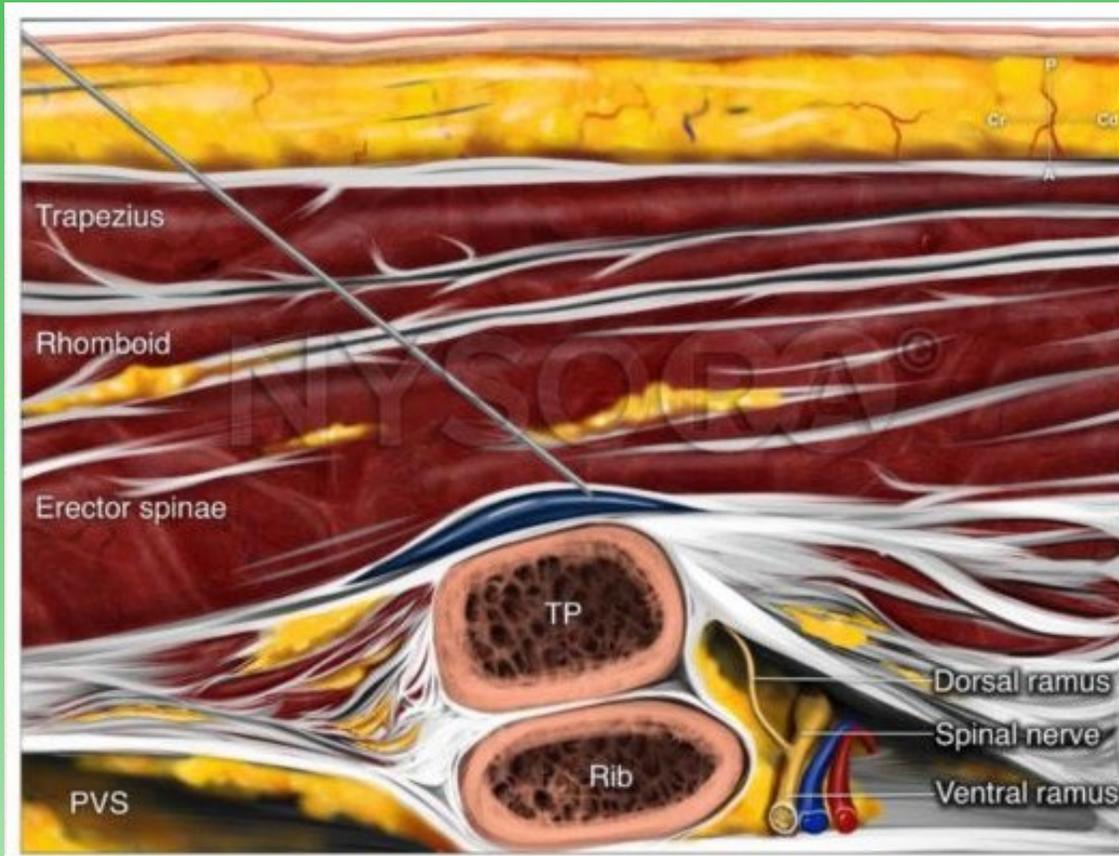
A. S1

- i. Hysterectomy/hysteroscopy
- ii. Rectal

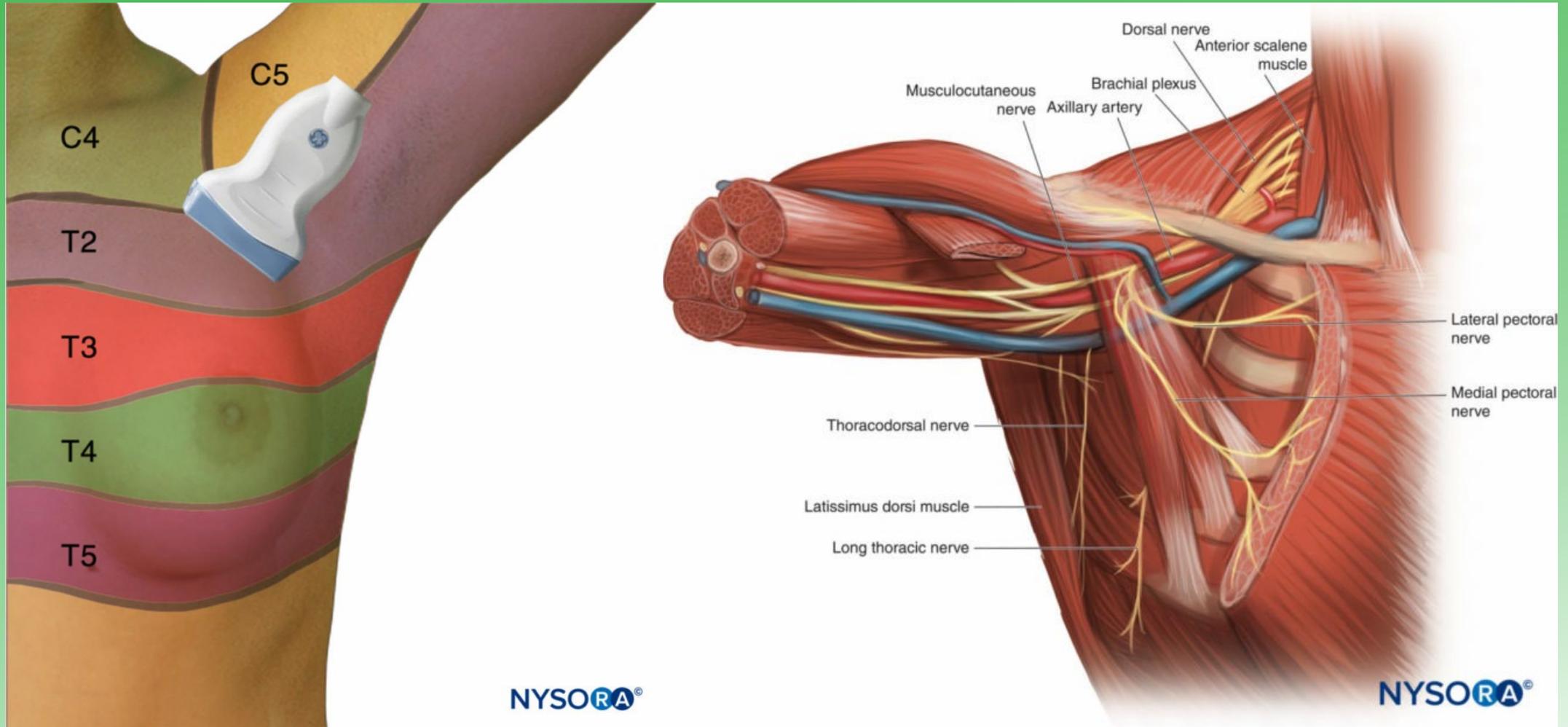
Erector Spinae indications



Erector Spinae



Thoracic



Interpectoral/Pectoserratus Blocks

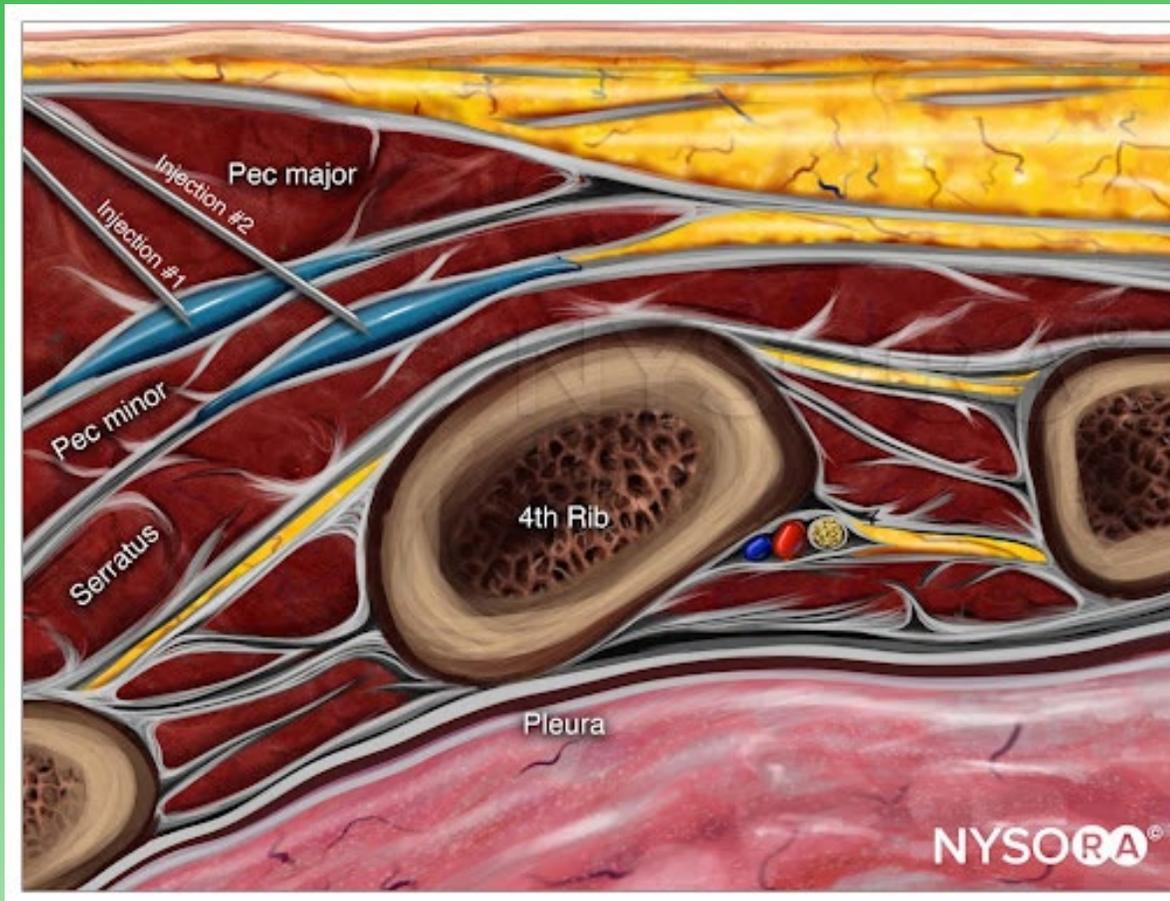
I. Interpectoral Plane

- A. Injection between Pec Major and Minor
- B. Medial and Lateral Pectoral nerves
- C. Innervation to pectoral muscles

II. Pectoserratus Plane

- A. Injection between Pec Minor and Serratus Anterior
- B. Thoracic intercostal nerves T2-T5
- C. Skin and breast tissue
- D. Does not cover sternum
- E. Does not extend laterally beyond anterior axillary line
- F. Does not extend below inframammary fold

Interpectoral/Pectoserratus Blocks



Serratus Anterior Block

I. Superficial or Deep

- A. Between Latissimus Dorsi and Serratus Anterior
- B. Below Serratus Anterior

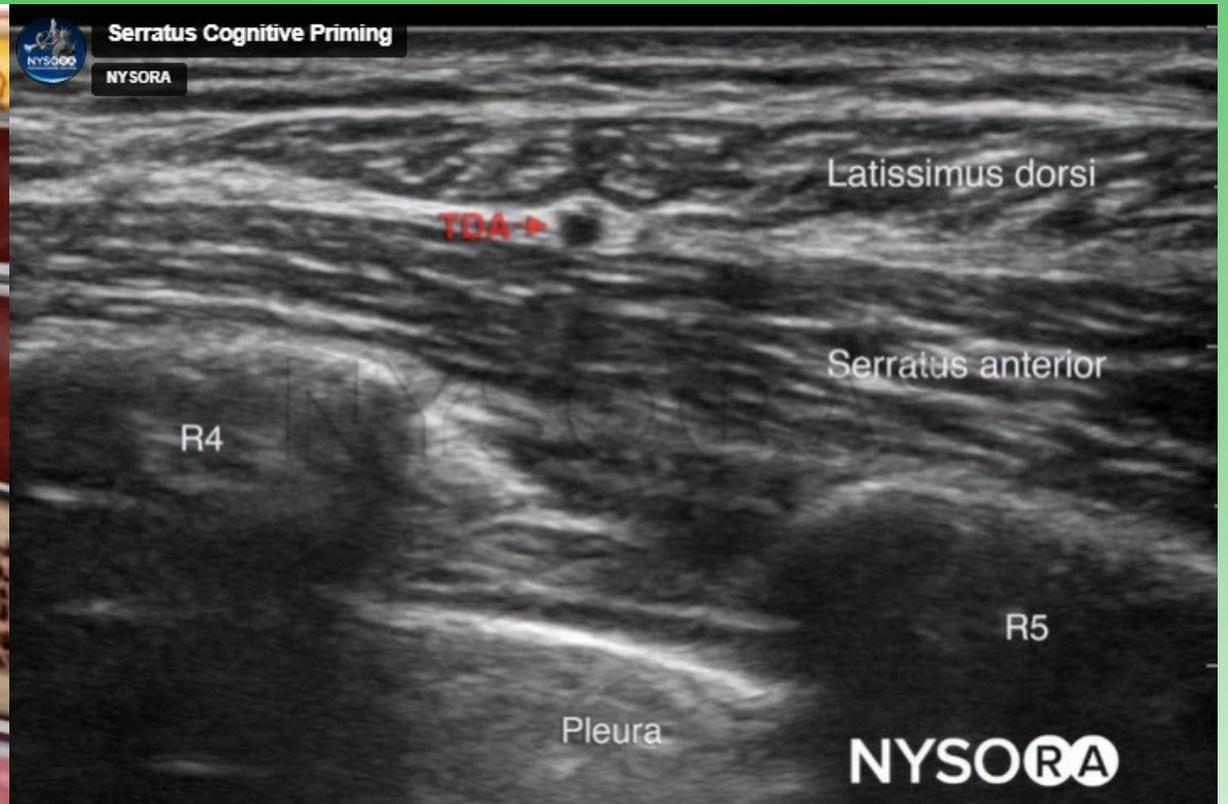
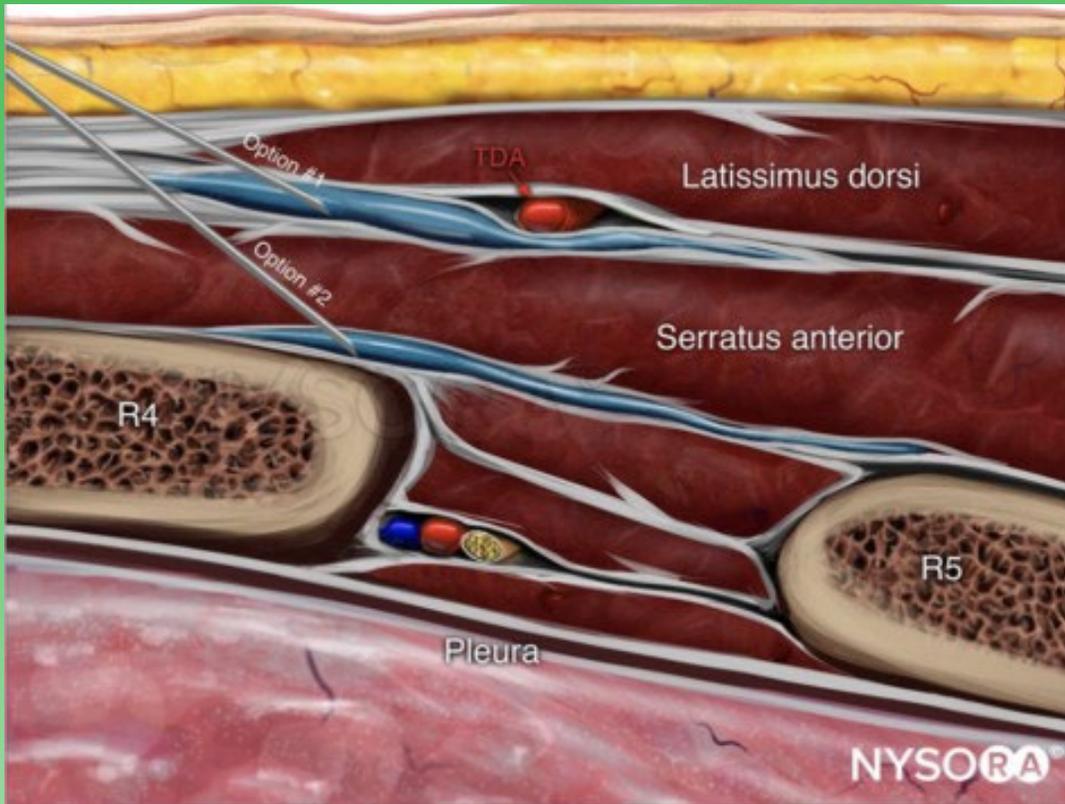
II. Coverage

- A. Intercostal Nerves T3-T9
- B. Intercostal Brachial Nerve
- C. Long Thoracic Nerve
 - i. Winged Scapula
- D. Thoracodorsal nerve

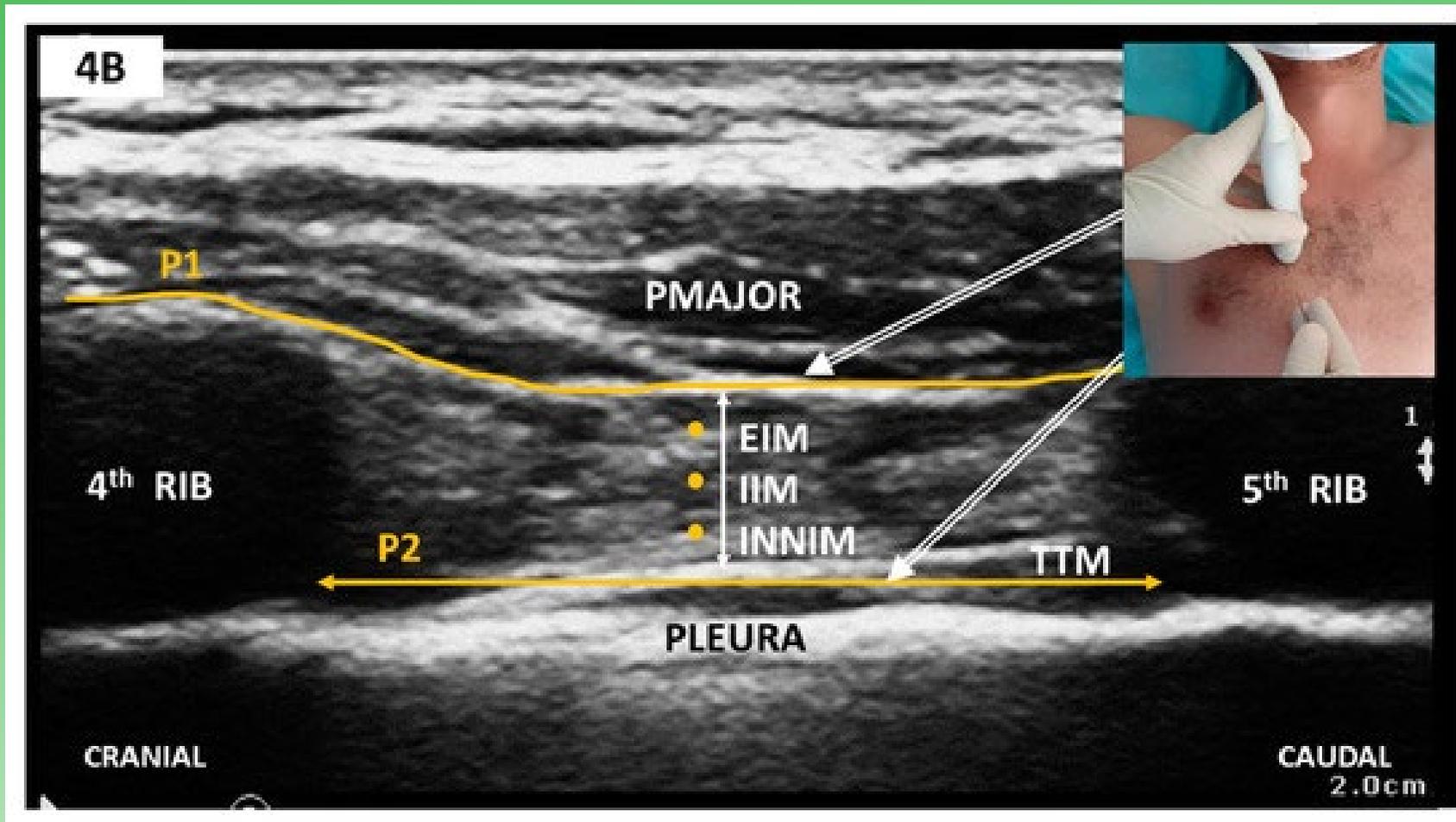
I. Indications

- A. Chest tube or drain
- B. Anterior Rib fractures
- C. Thoracotomy
- D. Won't cover sternum

Serratus Plane Block

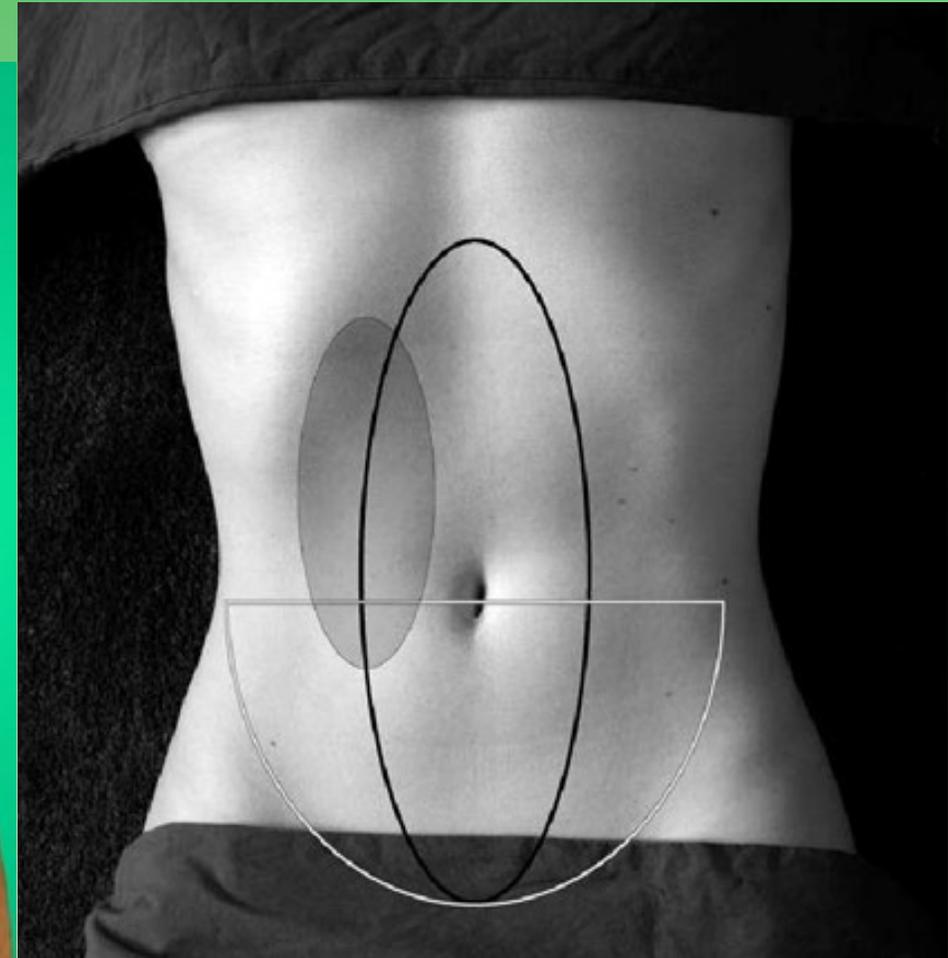


Parasternal Intercostal Nerve Block



Anterior Blocks of the Abdomen

- I. Midaxillary TAP
- II. Subcostal TAP
- III. Rectus Sheath
- IV. External oblique Intercostal Block

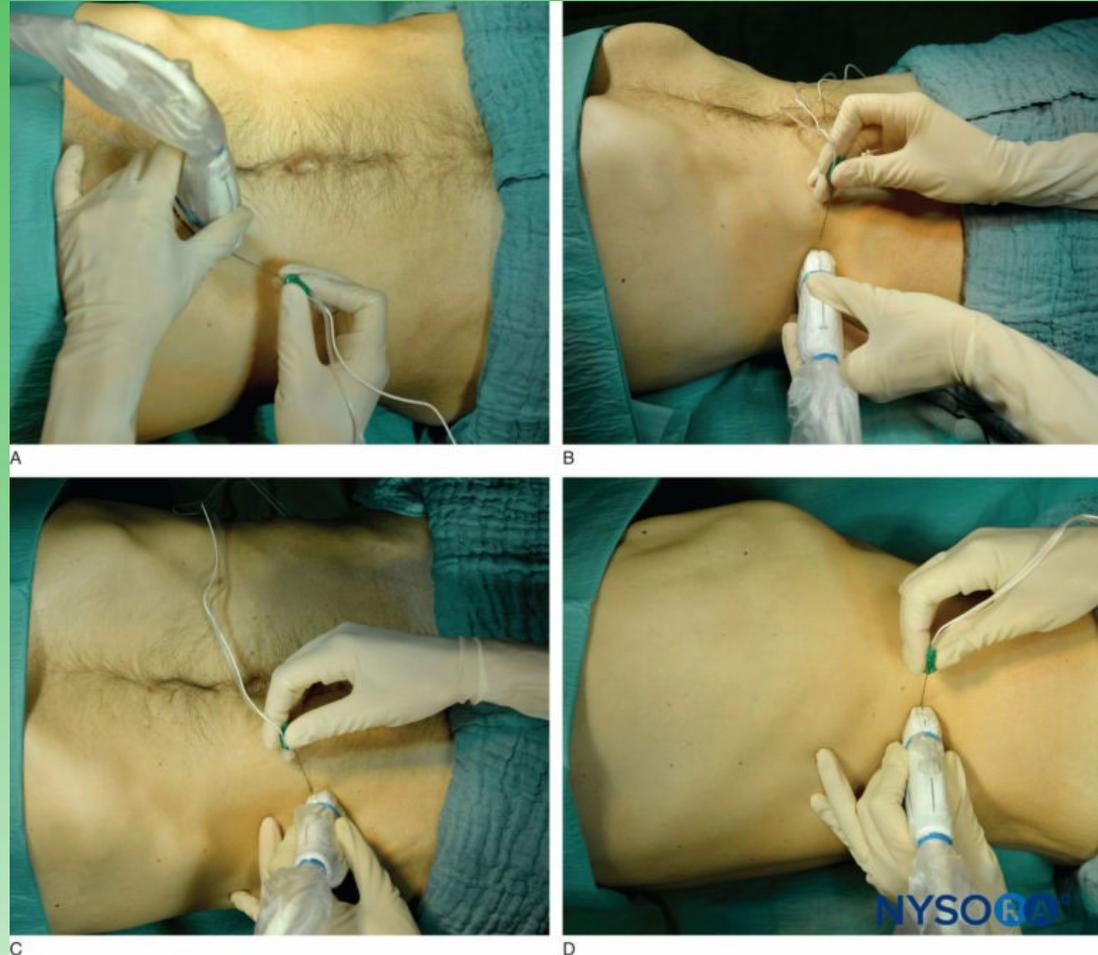


TAP Blocks

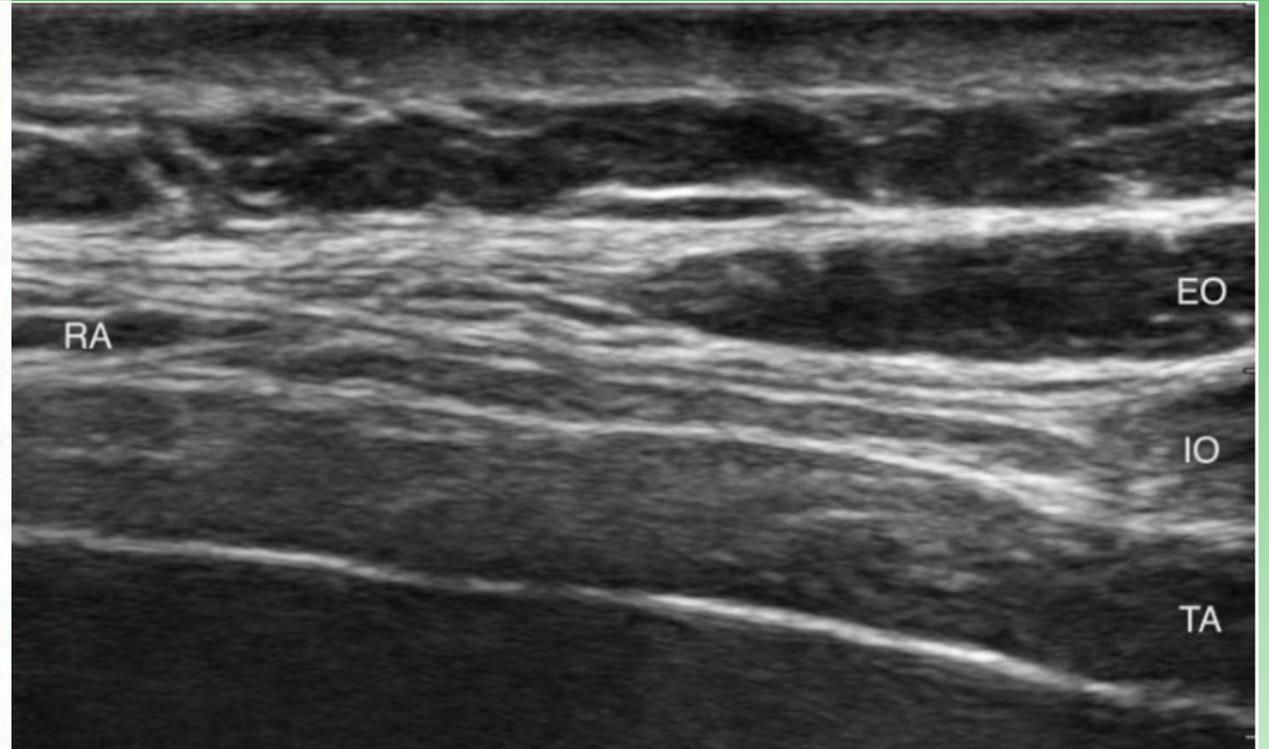
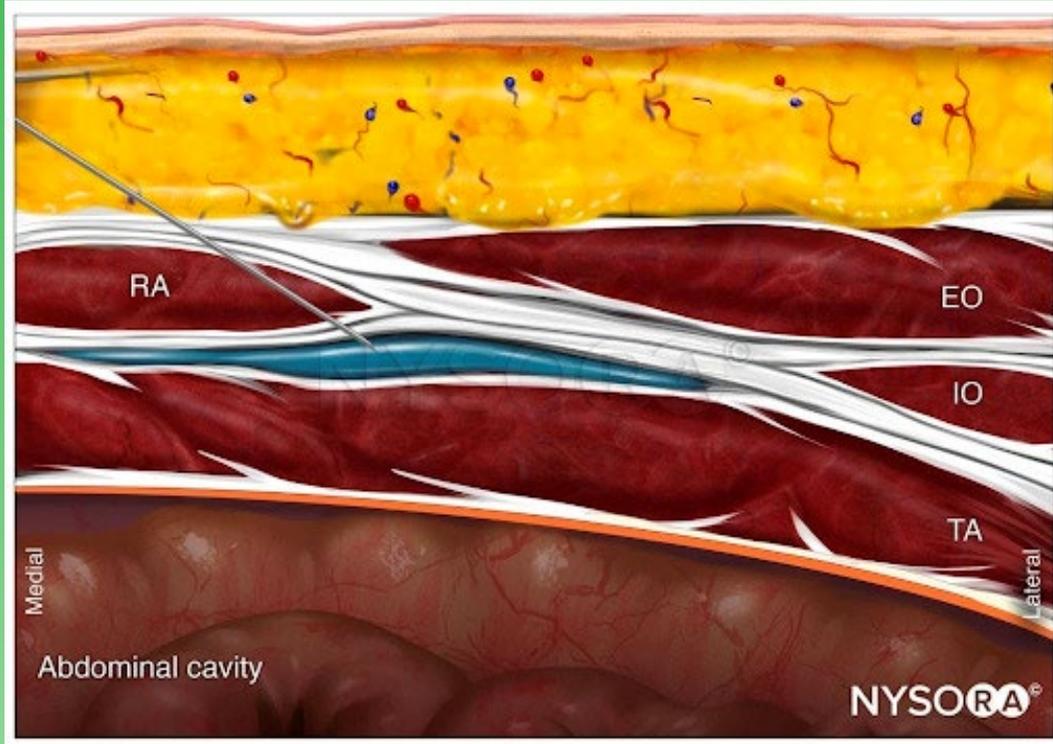
I. Subcostal/Midaxillary

A. T7-10

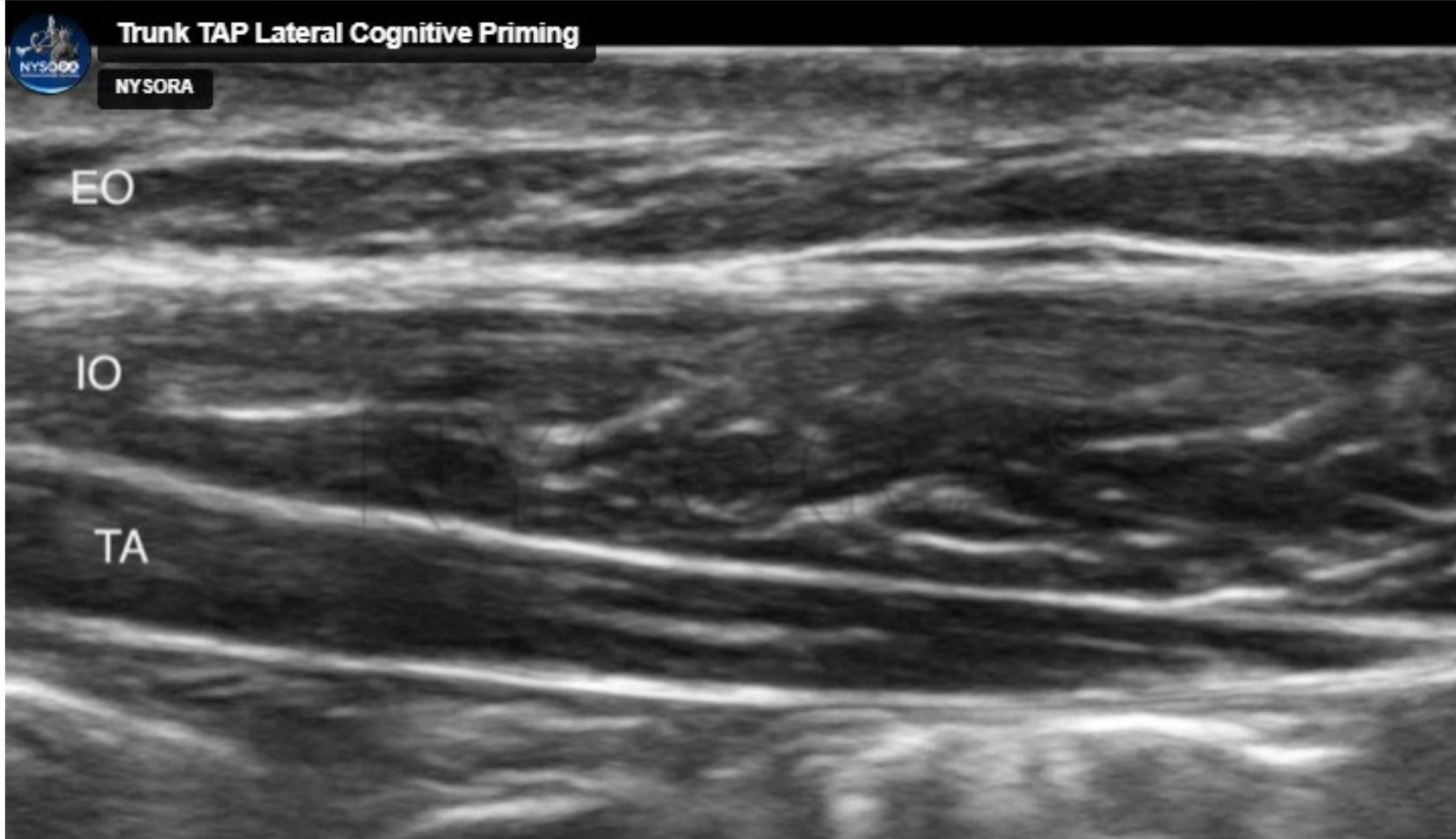
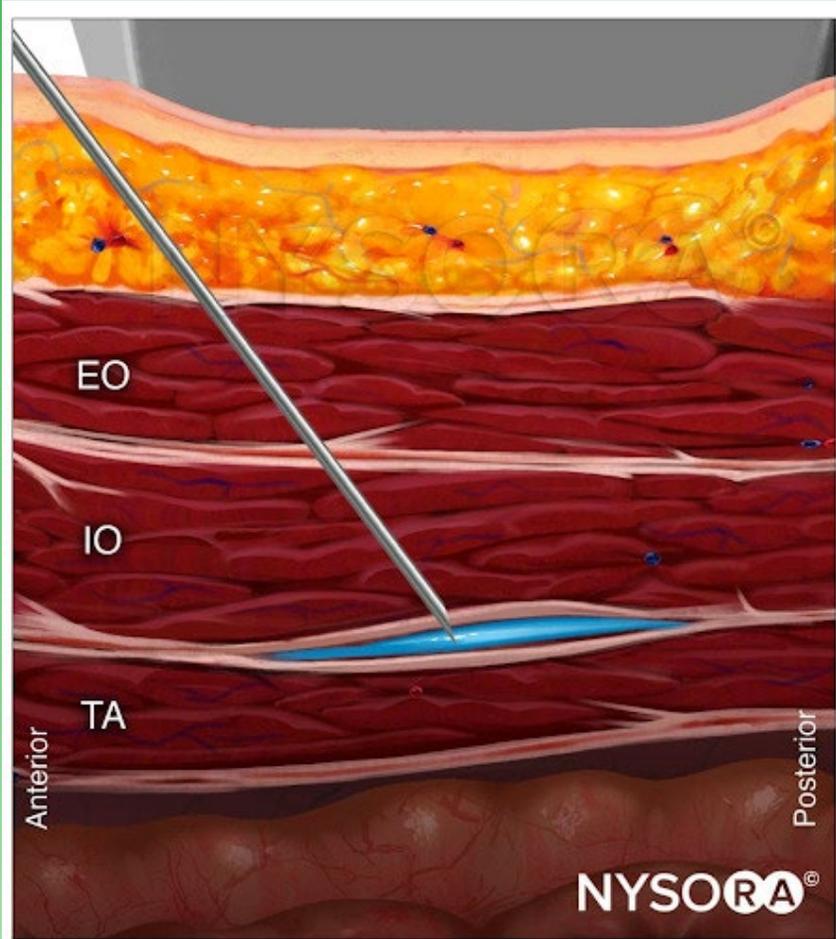
B. T10-T12



Subcostal TAP Blocks



Midaxillary TAP Block



Rectus Sheath



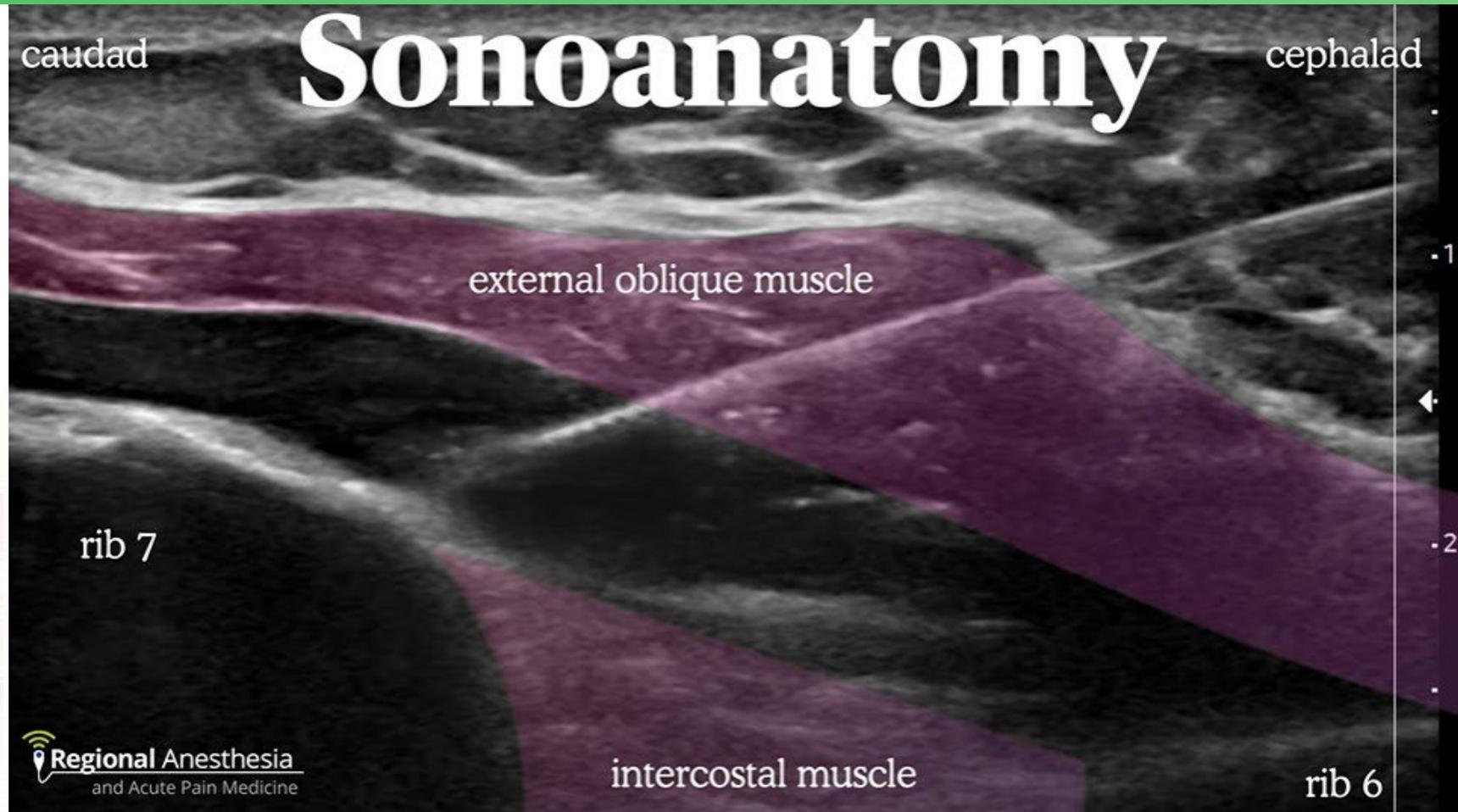
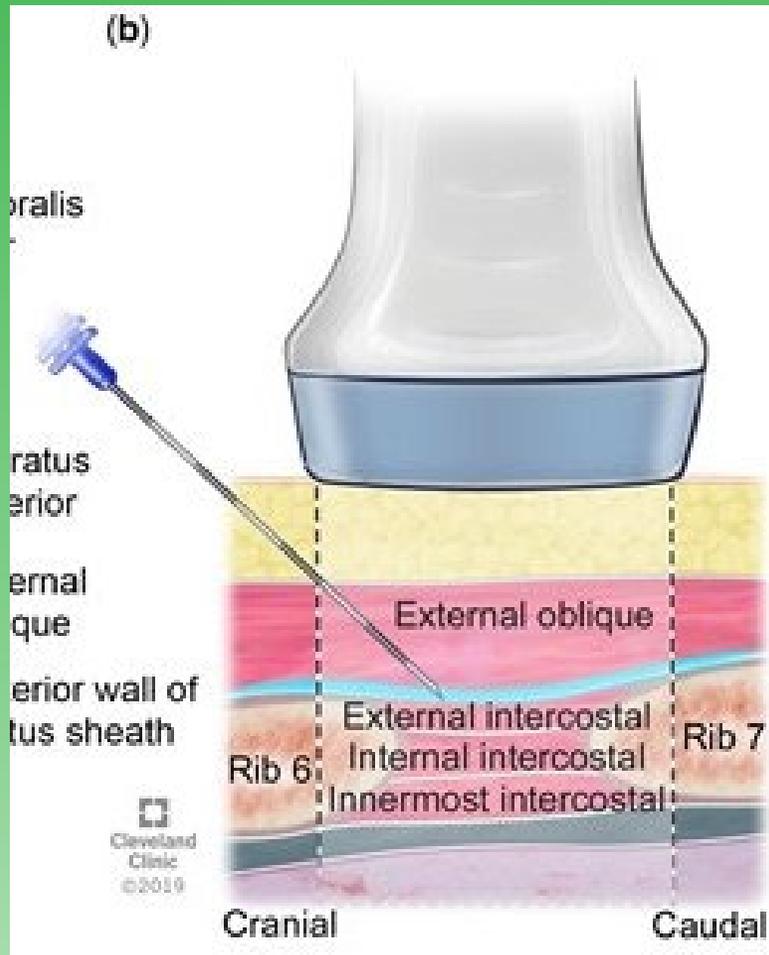
External Oblique Intercostal Nerve Block

- I. Like Subcostal TAP
 - A. Easier to Perform
 - B. Wider coverage
 - C. Catheter placement



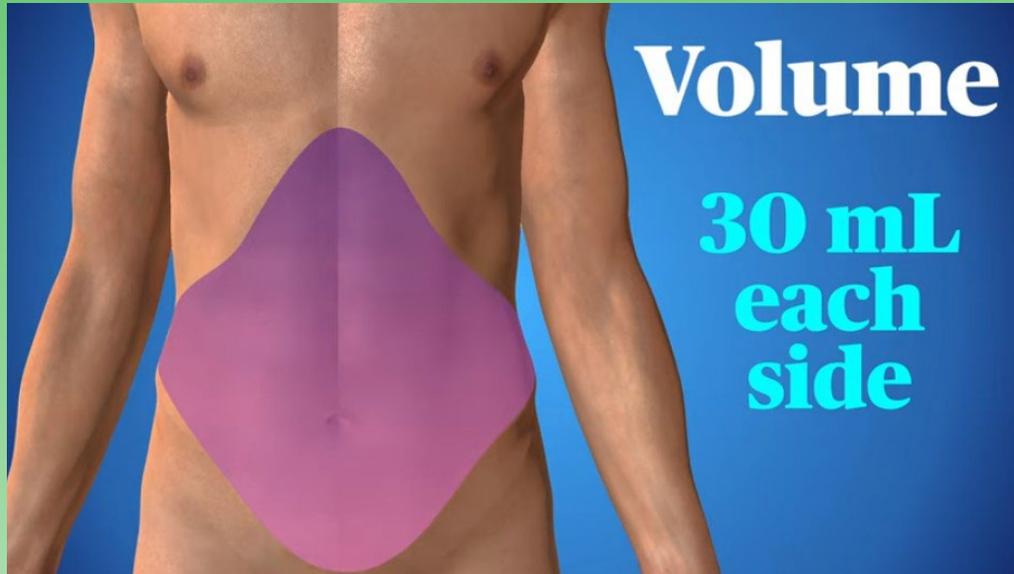
Probe position

External Oblique Intercostal Nerve Block



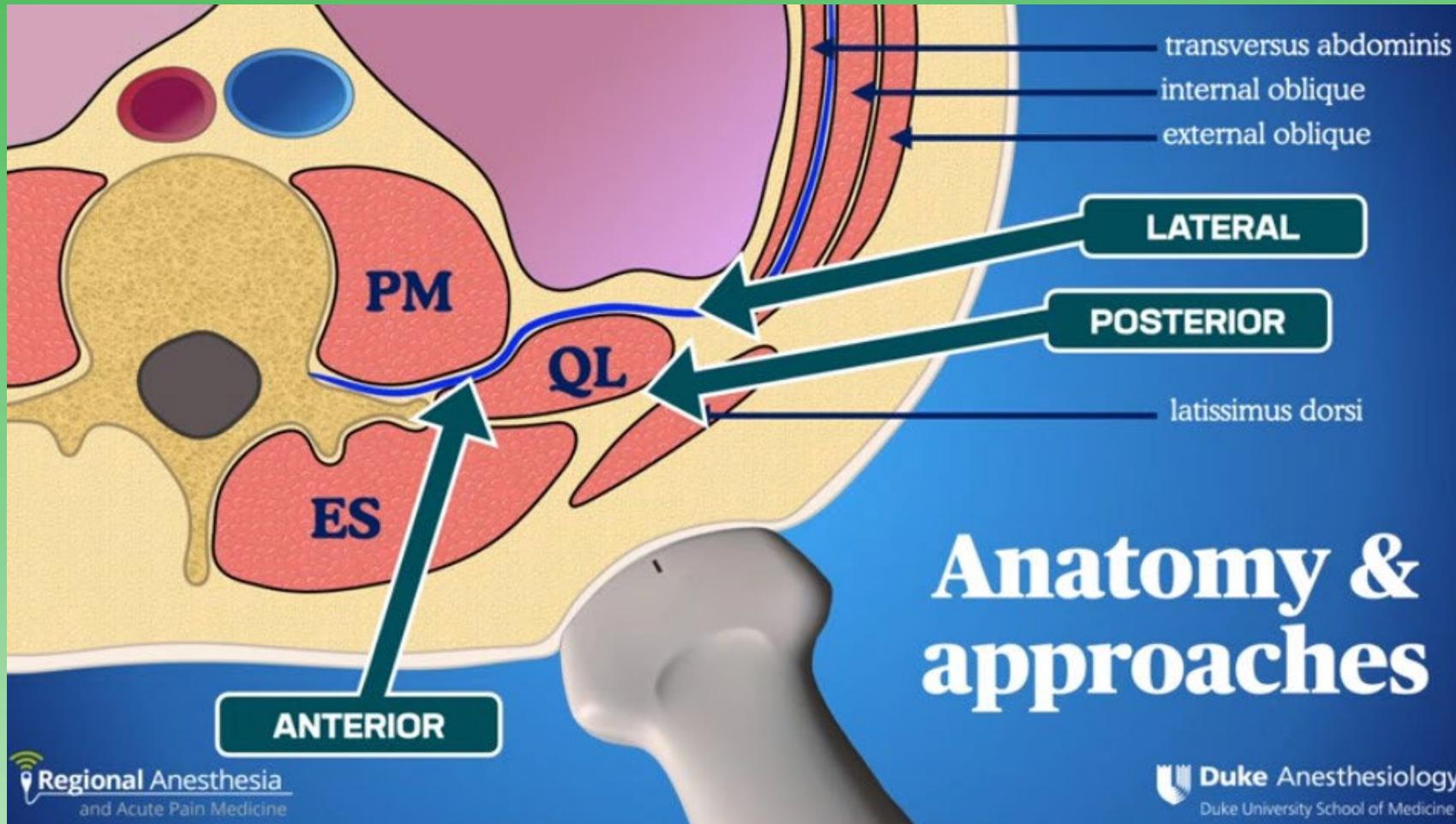
Quadratus Lumborum

- I. Advantages
- II. Has potential for visceral pain coverage
- III. Wide area of distribution

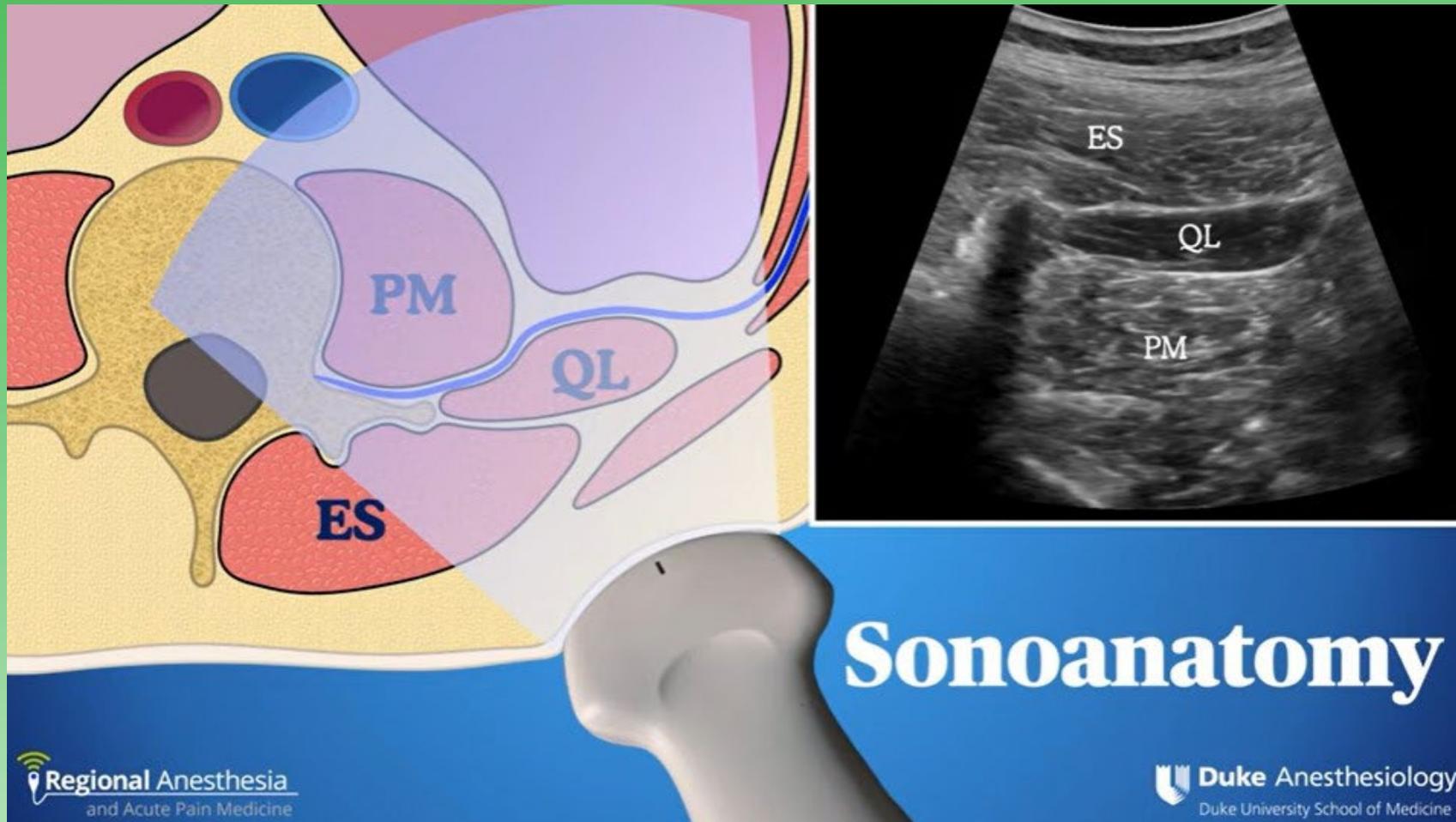


- I. Disadvantages
 - A. Intermediate difficulty block
 - i. Anatomy can be difficult to visualize
 - ii. Requires curvilinear probe
 - B. Positioning
 - i. Patient required to be lateral or prone
 - C. Deep block
 - i. Hematoma has been reported

Quadratus Lumborum naming convention



Quadratus Lumborum



But Wait There's More

- I. Fascial Plane Blocks for Orthopedics
 - A. Clavopectoral Fascial Plane Block
 - B. Fascia Iliaca Block
 - C. PENG Peri-Scapular Nerve Group
 - D. Ipack Interspace between the popliteal artery and capsule knee
 - E. Local infiltration of the genicular nerves
 - F. Popliteal plexus

Local Anesthetics

I. Bupivacaine 0.25%

- A. Cheaper
- B. Lasts longer
- C. More prone to muscular weakness
- D. More cardio-toxic

II. Ropivacaine 0.2%

- A. Exact opposite

III. Max dose

- A. 3 mg/kg
- B. 1 ml/kg “safe dose”

Adjunct

- I. Decadron PF 5-10 mg
 - A. Double block duration
 - B. Possible neurotoxicity at high concentrations
 - C. IN vs IV
- II. Epinephrine 1:100,000-250:000
 - A. Vasoconstriction
 - i. Reduces chance of LAST
 - ii. Detect vascular injection
 - B. Prolongs block duration 6-8 hours
- III. Neostigmine 500 mcg
 - A. May not work

Adjuncts

- I. Dexmedetomidine 50-100 mcg
 - A. Also provides systemic analgesia
 - B. Can cause hypotension and/or sedation
- II. Clonidine 100 mcg
 - A. Also provides systemic analgesia
 - B. Can cause hypotension and/or sedation
- III. Magnesium 1-2 Gm
 - A. Appears to be safe alternative in patients with neuropathy

Adjuncts

I. Midazolam

A. Neurotoxic

II. Buprenorphine 0.3 mg

A. Mild benefit

B. Sedation

III. Morphine PF 10 Mg

A. Mild benefit

B. N/V and sedation

Adjuncts

- I. All are off-label uses not approved by FDA
- II. Have literature to prove safety and effectiveness
- III. Are commonly used in practice