



PAIN MANAGEMENT WEBINAR SERIES | JUNE 24, 2025

Erector Spinae Plane Block

Anatomy Review and Live Demonstration



Ben Sampedro



Christian Falyar



Nicolette Hooge



MTSA ULTRASOUND + PAIN MANAGEMENT

Acute Surgical Pain Management Fellowship (ASPMF)

Foundations of Regional Anesthesia Course

Continuing Education

Pain Management Webinar Series

Cadaveric Workshops

Point-of-Care (PoCUS) Workshops

TEE/TTE Workshops



Objectives

Discuss the mechanism of action, indications, contraindications, functional anatomy, and complications of the erector spinae plane block.

Perform an ultrasound-guided erector spinae plane block, highlighting key landmarks, transducer positioning, procedural steps, and common local anesthetic dosing strategies.



Mechanism of Action

Fascial plane block

Local anesthetic injected deep to the ESMG and superior to the TP

1. Dorsal primary rami blocked as it exits posteriorly
2. Spread through the costotransverse ligament to intervertebral space (aka 'Poor Man's Paravertebral')



Indications

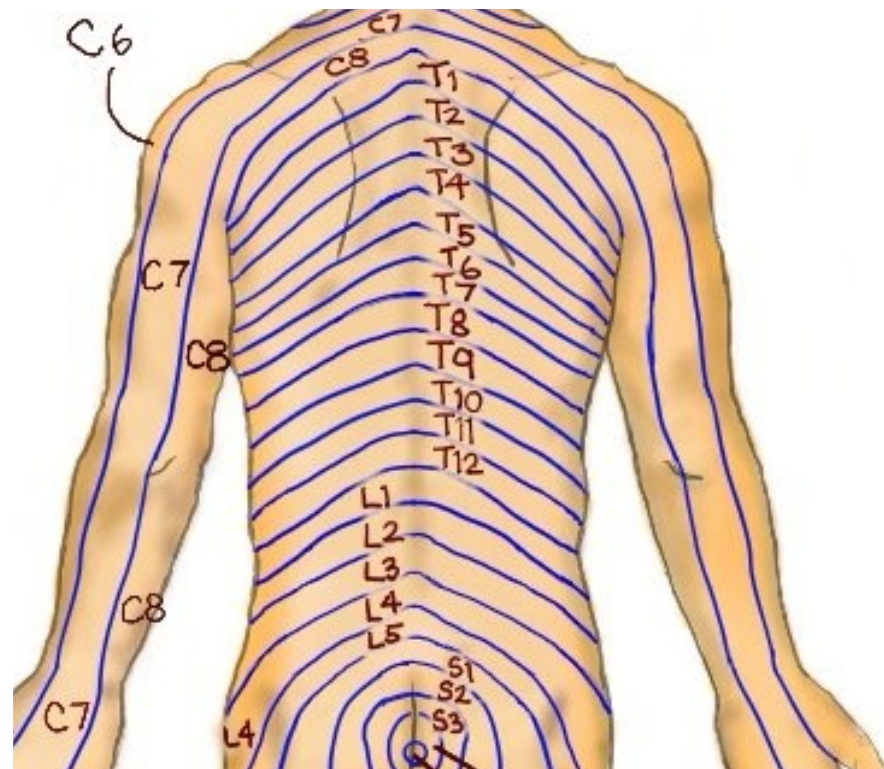
Numerous indications, level dependent:

T5-T7

T8-T10

T10-T12

L1-L5



JACK VANDER BEEK 2023



Contraindications

There are very few contraindications...

Bleeding

Infection

True local anesthetic allergy



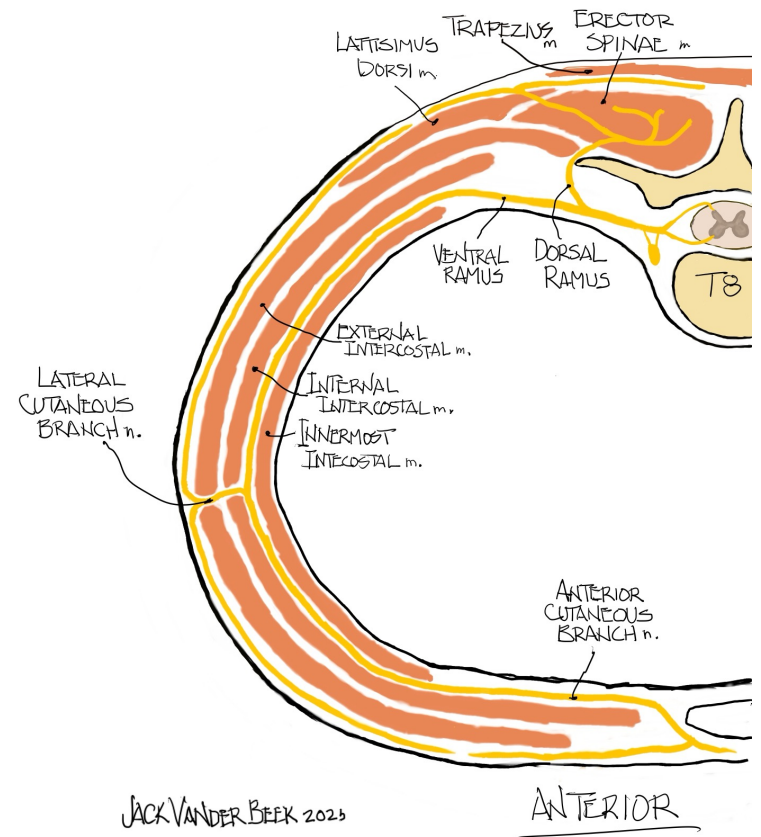
Functional Anatomy

Erector spinae muscle group (ESMG)

Transverse process (TP)

Dorsal Primary Rami

CHEST WALL INNERVATION



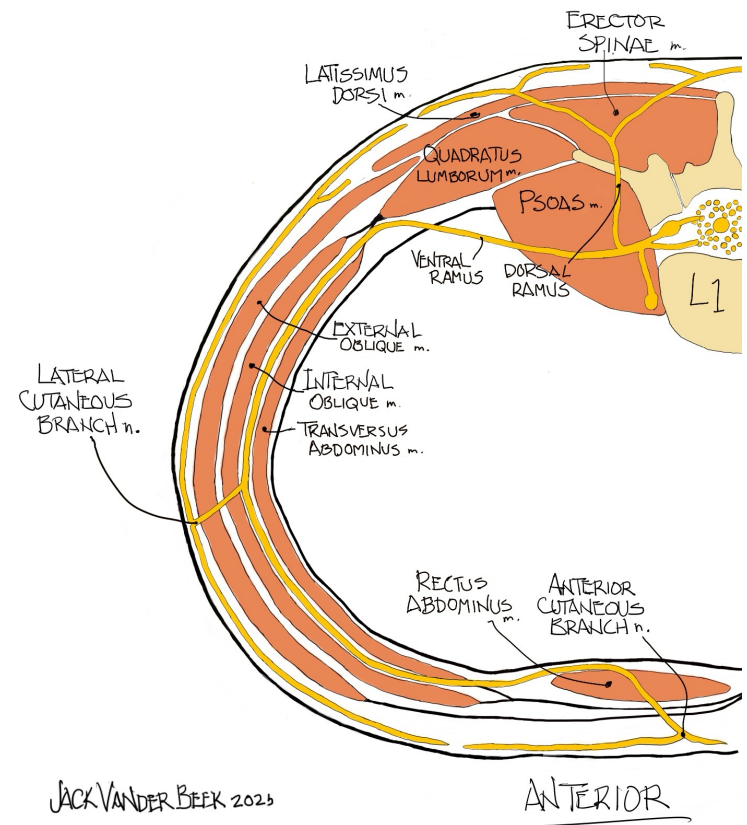
Functional Anatomy

Erector spinae muscle group (ESMG)

Transverse process (TP)

Dorsal Primary Rami

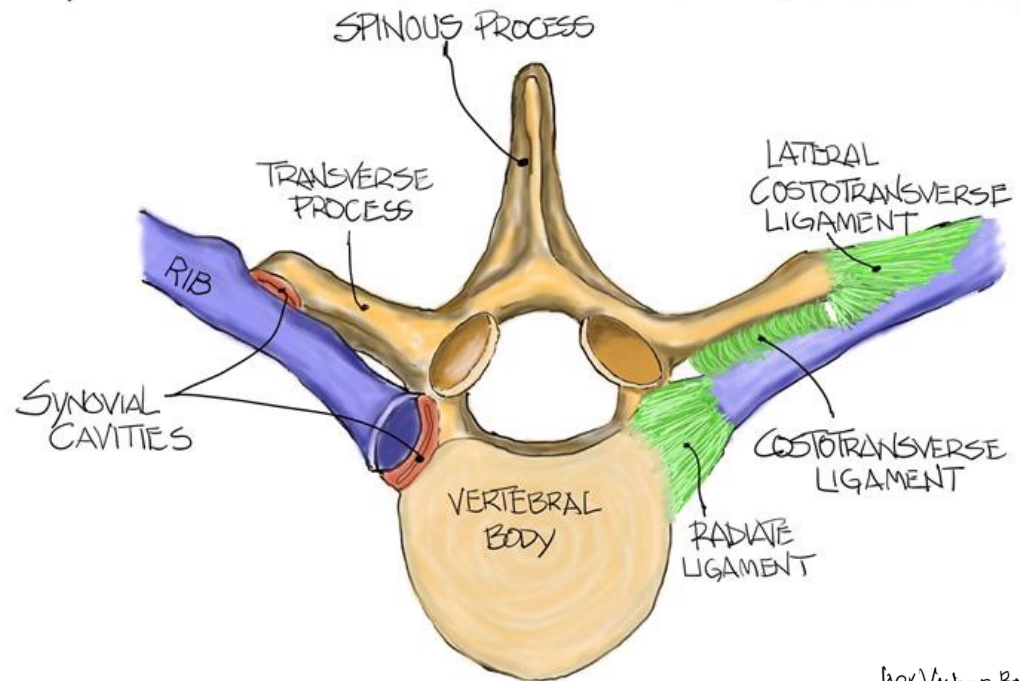
ABDOMINAL WALL INNERVATION



Functional Anatomy

Costotransverse Ligament

THE COSTOTRANSVERSE LIGAMENT



JACK VANDER BEEK 2023

Block Coverage

Zhang et al. performed T5 ESB block on 12 volunteers with 20 mL of 0.5% ropivacaine

T4-11 cutaneous sensory blockade
Extending from injection site
laterally to posterior axillary line
The anterior chest, lateral chest wall, and abdomen not affected

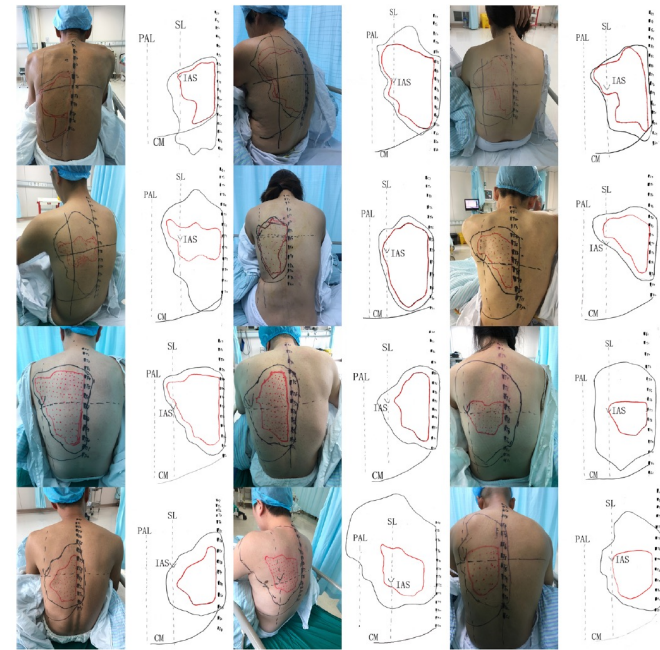


Fig. 3 Photos and scanned transparencies; scapular line (SL), posterior axillary line (PAL); costal margin (CM); inferior angle of scapula (IAS)

BMC Anesthesiol. 2020.



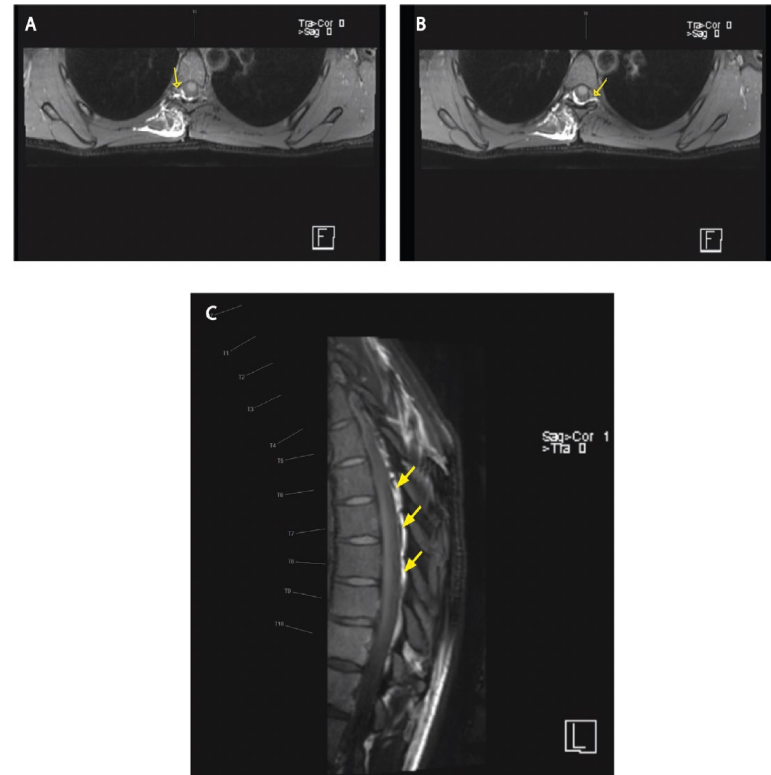
Block Coverage

Sørenstua et al. performed T7 ESB block on 10 volunteers with 30 mL of 0.25% ropivacaine and 0.3 mL of gadolinium

MRI demonstrated LA spread across ESP muscles and intercostal space on all subjects

9/10 had spread into paravertebral space, 8/10 into neural foramina, and 4/10 into epidural space

Only four had loss of sensation both anterior and posterior of midaxillary line



Reg Anesth Pain Med. 2023.



Local Anesthetic Dosing

Low concentration LA

Ropivacaine 0.2-0.25%

Bupivacaine 0.2%

Thoracic

2.5 mL / level spread (upper thoracic)

3.3 mL / level spread (mid thoracic)

Lumbar

5 mL / level spread (lumbar)



Side-Effects & Complications

Variable efficacy*

Establish realistic expectations

Anatomical difference between lumbar and thoracic ESB

There are few risks associated with the ESB:

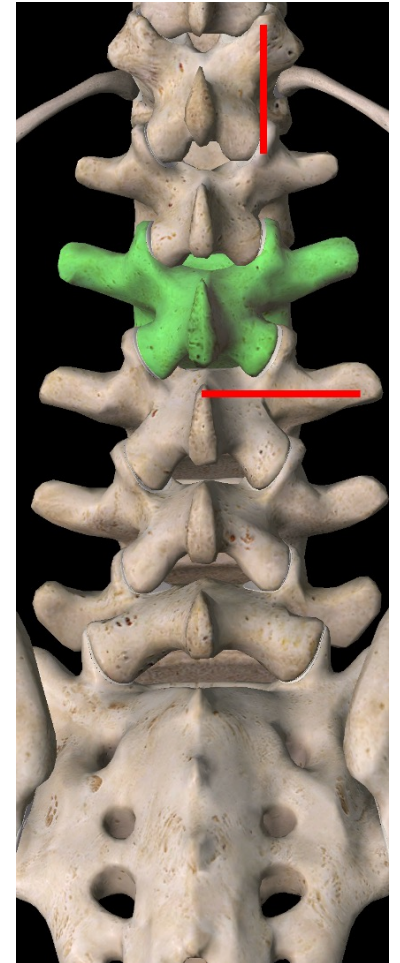
Pneumothorax

Local anesthetic systemic toxicity (LAST)

Bleeding

Hematoma

Quadriceps weakness (lumbar)



References

Falyar CR. Regional Anesthesia: Upper extremity, lower extremity, and truncal blockade. *Nagelhout's Nurse Anesthesia*. St. Louis, Mo: Saunders/Elsevier; 2022.

Hadzic, A., & New York School of Regional Anesthesia. *Hadzic's textbook of regional anesthesia and acute pain management*. New York, N.Y.: McGraw-Hill Education LLC; 2017.

Forero M, Adhikary SD, Lopez H, Tsui C, Chin KJ. The Erector Spinae Plane Block: A Novel Analgesic Technique in Thoracic Neuropathic Pain. *Reg Anesth Pain Med*. 2016 Sep-Oct;41(5):621-7. doi: 10.1097/AAP.0000000000000451. PMID: 27501016.

Zhang J, He Y, Wang S, Chen Z, Zhang Y, Gao Y, Wang Q, Xia Y, Papadimos TJ, Zhou R. The erector spinae plane block causes only cutaneous sensory loss on ipsilateral posterior thorax: a prospective observational volunteer study. *BMC Anesthesiol*. 2020 Apr 20;20(1):88.

Sørenstua M, Zantalis N, Raeder J, Vamnes JS, Leonardsen AL. Spread of local anesthetics after erector spinae plane block: an MRI study in healthy volunteers. *Reg Anesth Pain Med*. 2023 Feb;48(2):74-79. doi: 10.1136/rapm-2022-104012. Epub 2022 Nov 9. PMID: 36351741.

NYSORA.com





Live Demonstration

Key Landmarks

Transducer Placement

Procedural Steps

Needle placement

Goal of LA spread



PAIN MANAGEMENT WEBINAR SERIES: Erector Spinae Plane Block

Stay In Touch

Email

benjamin.sampedro@mtsa.edu

christian.falyar@mtsa.edu

nicolette.hooge@mtsa.edu

LinkedIn

www.linkedin.com/in/vaulttrasound

www.linkedin.com/in/nicolette-hooge/

Instagram

[@mtsa_1950](https://www.instagram.com/mtsa_1950)

[@vaulttrasound](https://www.instagram.com/vaulttrasound)





Thank You



Evaluation Form and Continuing Education Credit

Scan the QR code to fill out the evaluation form which helps us assess the effectiveness of this webinar, and to receive your Continuing Education Credit.