



European Society of
Regional Anesthesia
& Pain Therapy
ESRA ITALIA



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XXVIII CONGRESSO NAZIONALE

Uno sguardo verso il Mediterraneo:
Il Rischio Clinico

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SAFE BLOCKS IN NON PEDIATRIC HUBS



IRCCS materno infantile Burlo Garofolo
Regione Friuli Venezia Giulia



Raffaella Sagredini
SC Anestesia e Rianimazione

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SIAARTI

PRO VITA CONTRA DOLOREM SEMPER

RACCOMANDAZIONI SIAARTI SARNePI

Raccomandazioni Clinico-Organizzative SIAARTI-SARNePI per l'anestesia in età pediatrica

Autori:

Calderini Edoardo*, Disma Nicola**, Lorenzini Laura*, Mondardini Maria Cristina**,
Picardo Giuseppe*, Salvo Ida*, Sammartino Maria**, Tesoro Simonetta**,
Bortone Luciano**, Mascheroni Cristina*, Conti Giorgio**

TIPS

Il documento definisce le raccomandazioni cliniche ed organizzative utili a limitare il rischio di complicanze maggiori durante le **procedure elettive di sedazione e di anestesia**, sia generale che regionale, in età pediatrica.

Il documento è rivolto ad **anestesisti-rianimatori** che si occupano di anestesia pediatrica, o ne sono comunque coinvolti, in misura diversa.

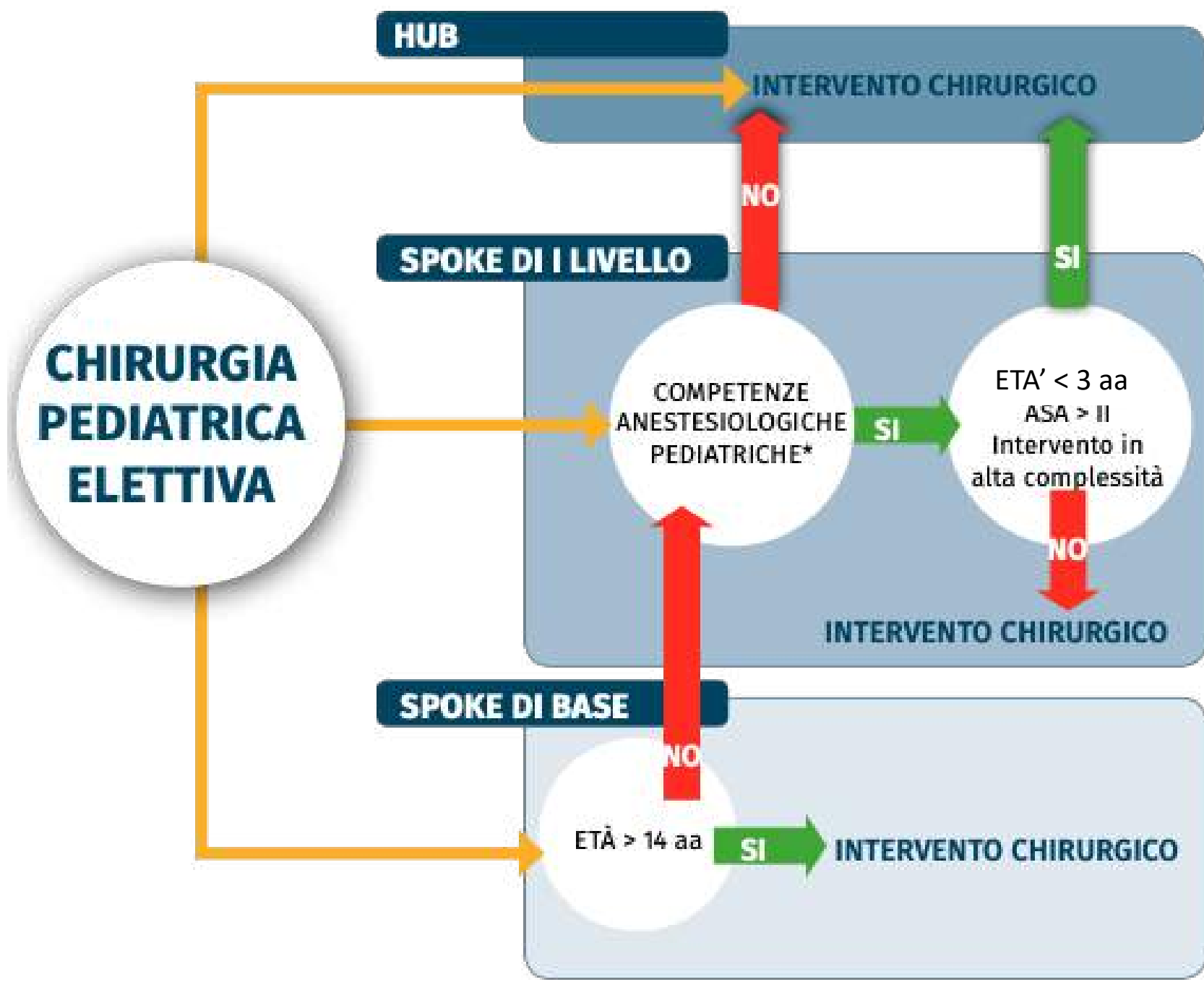


Raccomandazioni Clinico-Organizzative SIAARTI-SARNePI per l'anestesia in età pediatrica

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Vignati Roberto**, Mascheroni Cristina*, Conti Giorgio**

Raccomandazioni Clinico-Organizzative SIAARTI-SARNePI per l'anestesia in età pediatrica



Regional Anesthesia in Neonates and Infants

Bosenberg Adrian
Director Regional Anesthesia



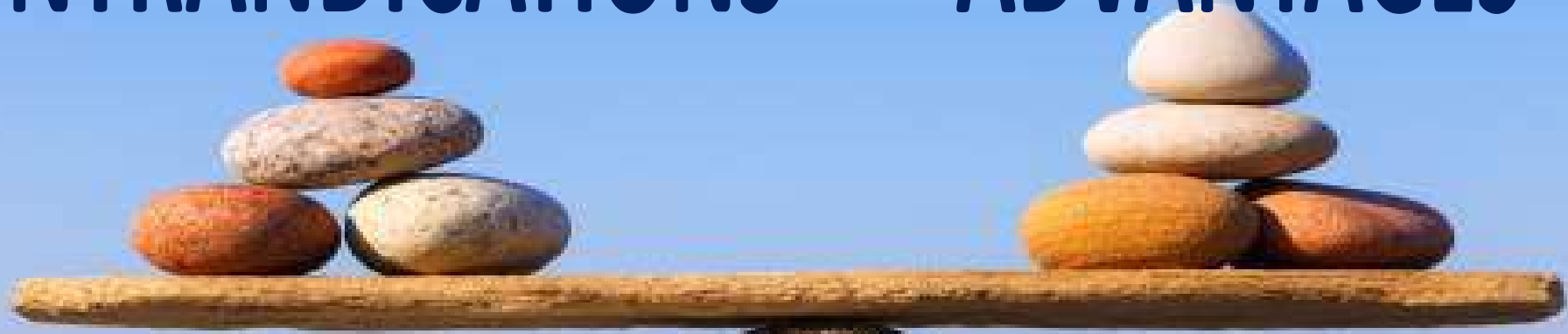
**“Effective pain relief is not only humane,
but may play a role in the surgical outcome”**

**“The challenge is to provide SAFE
and EFFECTIVE analgesia”**

SAFETY

CONTRANDICATIONS

ADVANTAGES



COMPLICATIONS



Complications in Pediatric Regional Anesthesia

An Analysis of More than 100,000 Blocks from the Pediatric Regional Anesthesia Network

In a prospective multicenter cohort of more than 100,000 blocks in children, there were no cases of permanent neurologic deficit associated with regional anesthesia. The rate of transient neurologic deficit was low at 2.4 per 10,000, and the incidence of local anesthesia toxicity was also low at 0.76 per 10,000.

The data from this study demonstrate a level of safety in pediatric regional anesthesia that is comparable to adult practice and confirms the safety of placing blocks under general anesthesia in children.

Pediatric Anesthesiology (2018)



Complications in Pediatric Regional Anesthesia

An Analysis of More than 100,000 Blocks from the Pediatric Regional Anesthesia Network

Table 1. Single-injection Blocks by Age Group

| | Neonate | 1–5 months | 6–11 months | 1–2 yr | 3–9 yr | ≥ 10 yr | Total |
|-----------------------------|---------|------------|-------------|--------|--------|---------|--------|
| Total | 705 | 7,385 | 12,595 | 16,738 | 20,974 | 27,931 | 86,328 |
| Neuraxial | | | | | | | |
| Caudal | 520 | 5,630 | 10,918 | 12,989 | 7,515 | 544 | 38,116 |
| Lumbar epidural | 2 | 20 | 29 | 49 | 203 | 373 | 676 |
| Sacral intervertebral | 0 | 5 | 4 | 4 | 3 | 0 | 16 |
| Subarachnoid | 19 | 201 | 18 | 41 | 185 | 1,570 | 2,034 |
| Thoracic epidural | 3 | 12 | 8 | 16 | 37 | 86 | 162 |
| Upper extremity | | | | | | | |
| Axillary | 23 | 76 | 59 | 162 | 292 | 369 | 981 |
| Infracavicular | 0 | 0 | 12 | 74 | 202 | 523 | 811 |
| Interscalene | 0 | 2 | 1 | 9 | 67 | 905 | 984 |
| Suprascavicular | 0 | 3 | 35 | 288 | 1,105 | 1,429 | 2,860 |
| Other | 0 | 0 | 3 | 10 | 9 | 39 | 61 |
| Lower extremity | | | | | | | |
| AC/saphenous | 0 | 1 | 2 | 36 | 509 | 2,196 | 2,744 |
| Femoral | 4 | 21 | 26 | 197 | 1,256 | 7,482 | 8,986 |
| Lumbar plexus | 0 | 0 | 0 | 14 | 63 | 197 | 274 |
| Popliteal | 0 | 2 | 23 | 82 | 611 | 2,211 | 2,929 |
| Sciatic | 0 | 9 | 12 | 61 | 570 | 2,611 | 3,263 |
| Other | 0 | 5 | 26 | 137 | 714 | 1,559 | 2,441 |
| Truncal | | | | | | | |
| II/IIH | 5 | 100 | 154 | 468 | 2,170 | 1,133 | 4,030 |
| Intercostal | 2 | 9 | 36 | 41 | 106 | 113 | 307 |
| Paravertebral | 19 | 55 | 27 | 57 | 112 | 265 | 535 |
| Penile | 1 | 434 | 510 | 604 | 879 | 391 | 2,819 |
| Rectus sheath | 10 | 113 | 107 | 344 | 1,280 | 584 | 2,438 |
| TAP | 92 | 352 | 248 | 579 | 2,033 | 2,326 | 5,630 |
| Other | 0 | 1 | 27 | 29 | 99 | 100 | 256 |
| Head and neck | | | | | | | |
| Infrorbital | 0 | 276 | 125 | 76 | 165 | 133 | 775 |
| Maxillary/greater palatine | 0 | 4 | 35 | 26 | 31 | 3 | 99 |
| Superficial cervical plexus | 3 | 10 | 58 | 178 | 520 | 448 | 1,217 |
| Other | 2 | 41 | 83 | 147 | 191 | 241 | 705 |
| Other | 0 | 3 | 7 | 19 | 44 | 93 | 166 |

AC, adductor canal; II/IIH, ilioinguinal/iliohypogastric; TAP, transversus abdominis plane.

MORE DIFFICULT

LEVEL 1

INTERSCALENE
AXILLARY
PERIPHERAL TERMINAL
NERVES IN UPPER LIMB
FEMORAL
POPLITEAL
SCIATIC:PRONE
ANKLE

LEVEL 2

SUPRACLAVICULAR
INFRACLAVICULAR
OBTURATOR
LATERAL FEMORAL
CUTANEOUS
RECTUS SHEATH
INTERCOSTAL
SCIATIC - SUBGLUTEAL
POPLITEAL SCIATIC: SUPINE
ILIOINGUINAL -
ILIOPOGASTRIC
NEUROAXIAL LUMBAR
SUPERFICIAL CERVICAL
SAPHENOUS
SUPRASCAPULAR
MID FEMORAL SCIATIC

LEVEL 3

ANY CATHETER BASED
TECHNIQUE
SCIATIC - TRANSGLUTEAL
SCIATIC - PARASACRAL
PSOAS COMPARTMENT
PEDIATRIC BLOCKS
PHRENIC
PARAVERTEBRAL CERVICAL
PARAVERTEBRAL
THORACIC
PARAVERTEBRAL LUMBAR
DEEP CERVICAL
SCIATIC ANTERIOR
APPROACH



A. Bosenberg



S. Suresh



G. Ivani



P.A. Lonnqvist



C. Ecoffey

Thanks to the support of ESRA and ASRA and their Presidents J De Andres & O De Leon Casasola



REVIEW



The European society of regional anesthesia and pain therapy and the American society of regional anesthesia and pain medicine joint committee practice advisory on controversial topics in pediatric regional anesthesia I and II: what do they tell us?

*Per-Arne Lönnqvist^a, Claude Ecoffey^b, Adrian Bosenberg^c,
Santhanam Suresh^d, and Giorgio Ivani^e*

Scientific evidence was obtained by performing a systematic search of literature. All committee members participated in the expert opinion decisions because all involved have had extensive experience (>20 years) on the topic.

*Per-Arne Lönnqvist^a, Claude Ecoffey^b, Adrian Bosenberg^c,
Santhanam Suresh^d, and Giorgio Ivani^e*

WHAT DO THEY TELL US ?

Performing nerve blocks in anesthetized or deeply sedated children

Dosing of local anesthetics for central nerve blocks

The use of test dosing

Dosing of local anesthetics for peripheral nerve blocks

Air or saline for loss-of-resistance

Use of adjunct drugs to local anesthetics

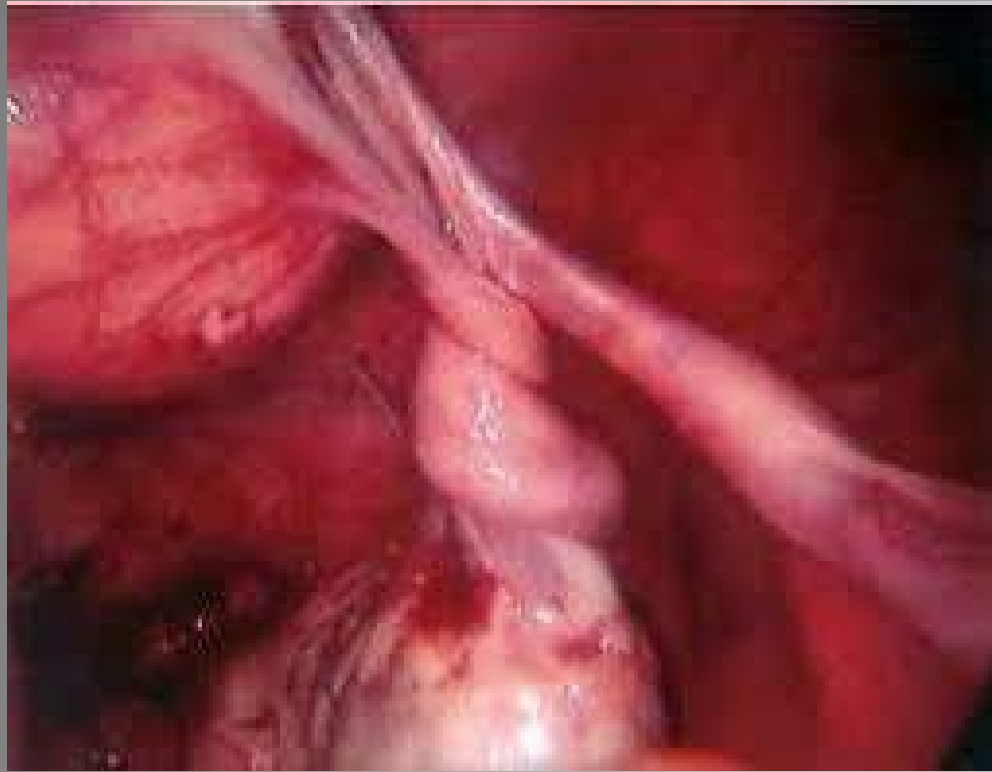
Acute compartment syndrome

Local anesthetic systemic toxicity in children

THE PATIENT ASLEEP



LAPAROTOMY vs LAPAROSCOPY

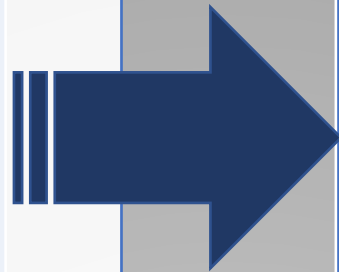




THORACOTOMY vs THORACOSCOPY

WHAT'S GOING ON?


**CENTRAL
NERVE
BLOCKS**



**PERIPHERAL
NERVE
BLOCKS**

Epidural analgesia in a paediatric teaching hospital: Trends, developments, and a brief review of literature

Jolin Wong¹ and Serene Siu Tin Lim²

Proceedings of Singapore Healthcare
2018, Vol. 27(1) 49–54
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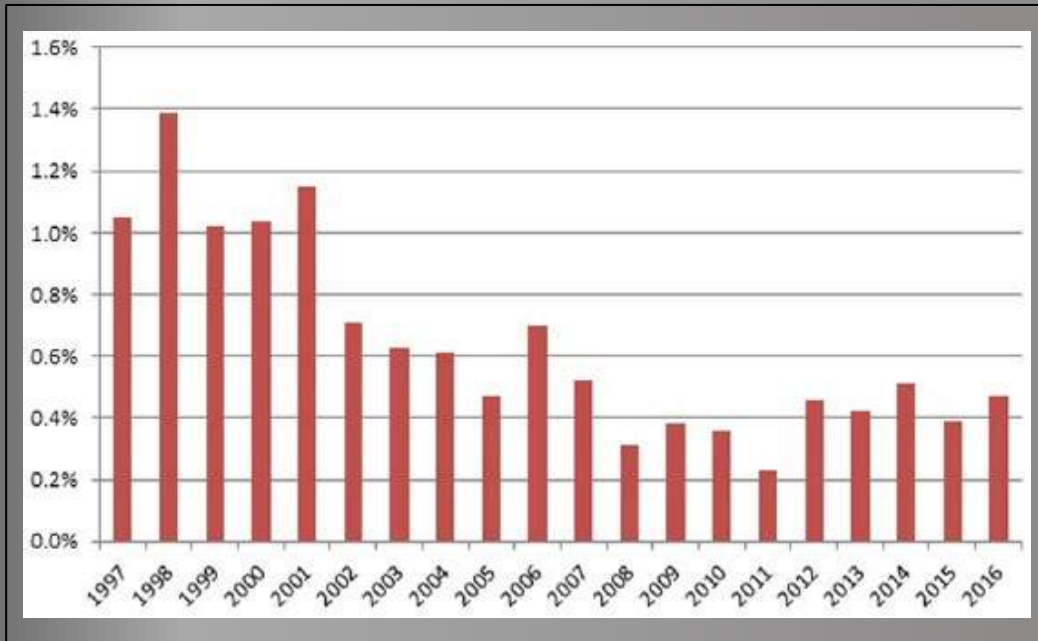


Figure 1. Incidence of epidural anaesthesia from 1997 to 2016 at a paediatric teaching hospital in Singapore (expressed as a percentage of total anaesthetics performed).

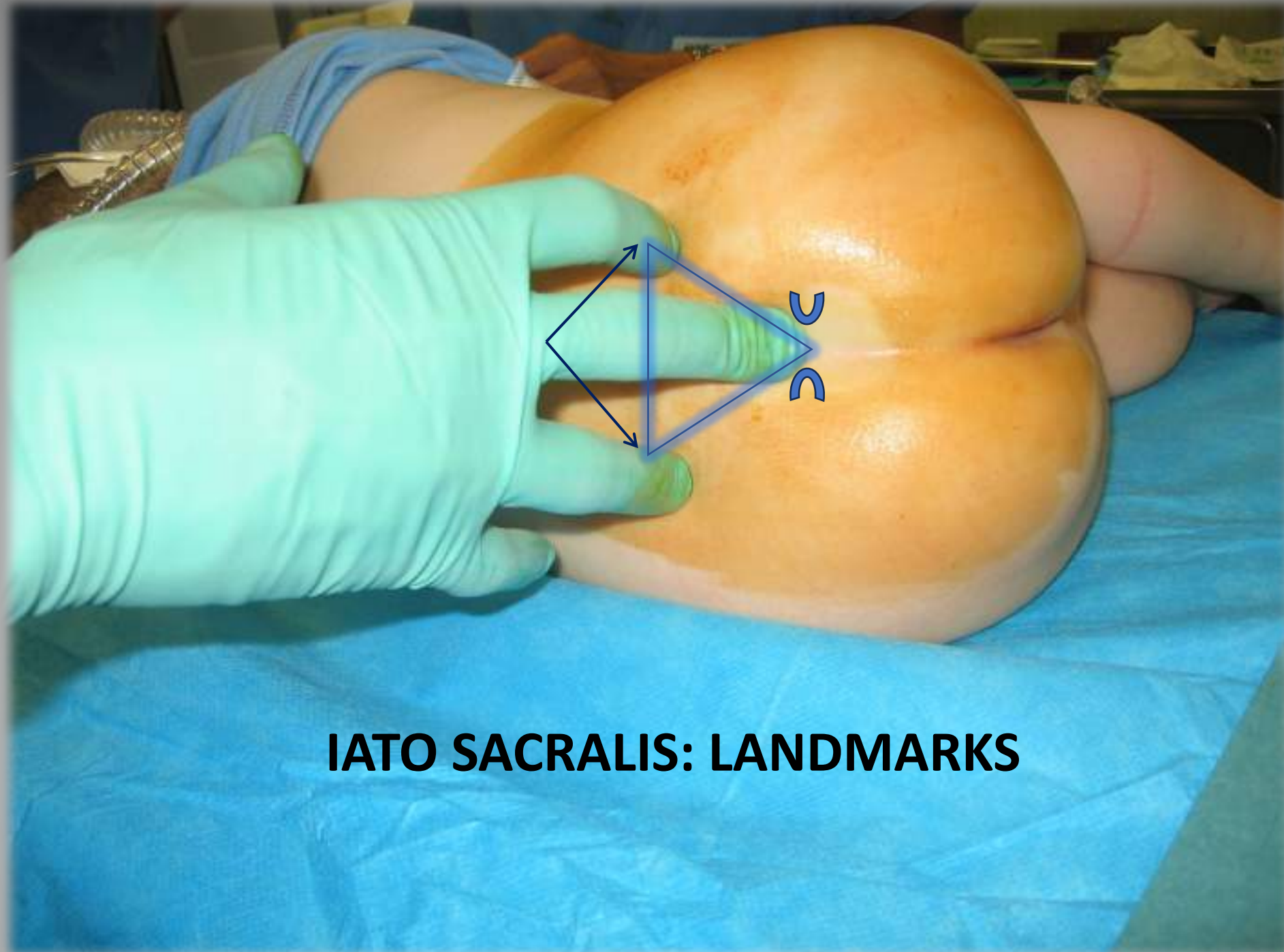
Conclusion

Over the last 19 years, the use of epidural analgesia has been on the decline as it is gradually replaced by alternative modalities of analgesia with superior safety profiles. In keeping with global trends, we expect further growth in the area of paediatric regional anaesthesia in the near future, specifically in the fields of peripheral nerve and truncal nerve blocks. However, there remain clear indications for the use of epidural analgesia in children, and for this reason paediatric anaesthetists must retain competency and confidence in its use.

CAUDAL BLOCK



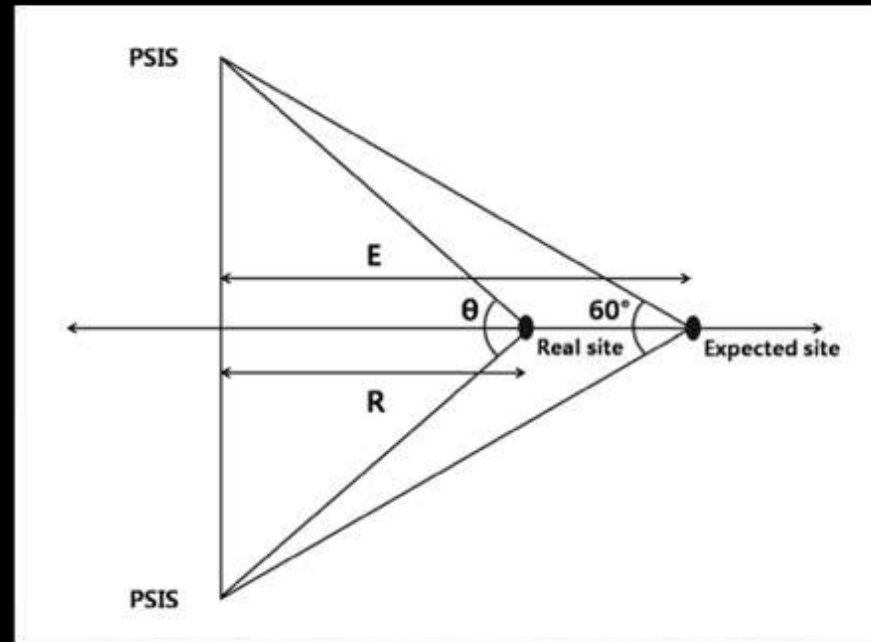
MOST WIDESPREAD



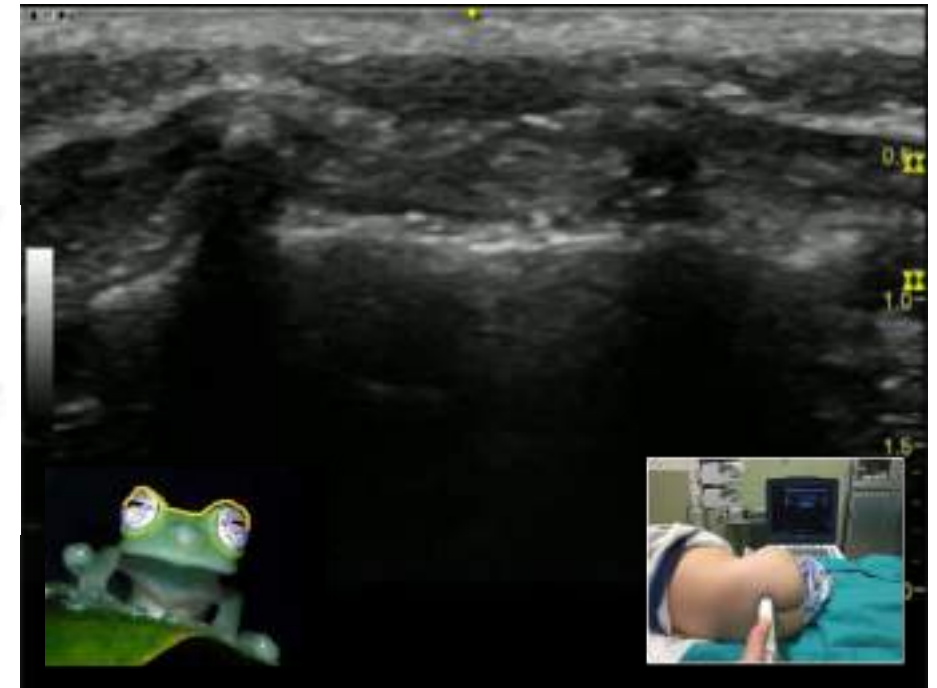
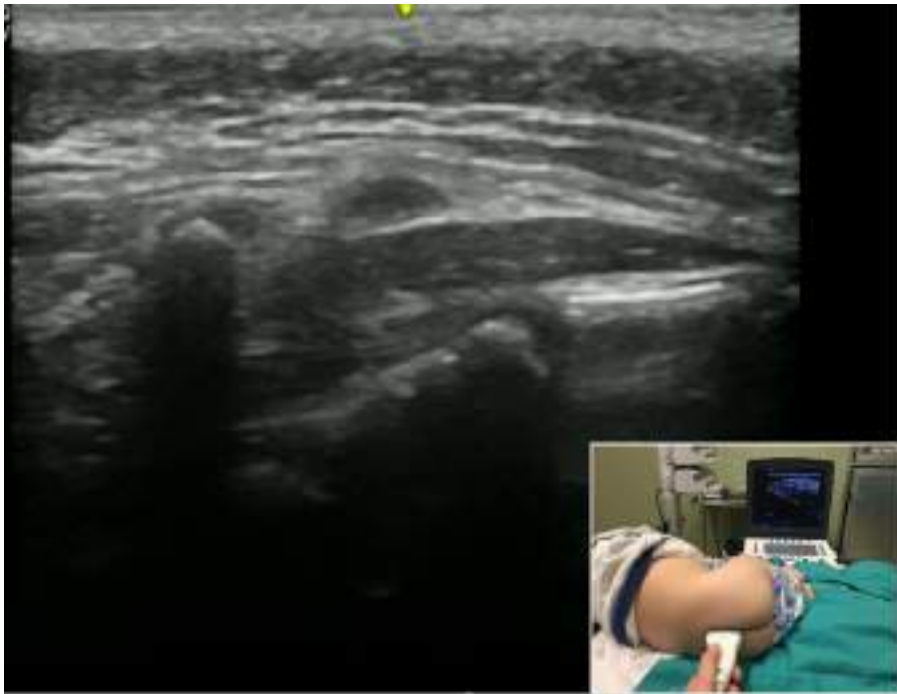
IATO SACRALIS: LANDMARKS

The Myth of the Equiangular Triangle for Identification of Sacral Hiatus in Children Disproved by Ultrasonography

Min-Soo Kim, MD, Kyung-Hwa Han, MS,† Eun Mi Kim, MD,* Seung Ho Jeong, MD,*
and Jeong-Rim Lee, MD, PhD**

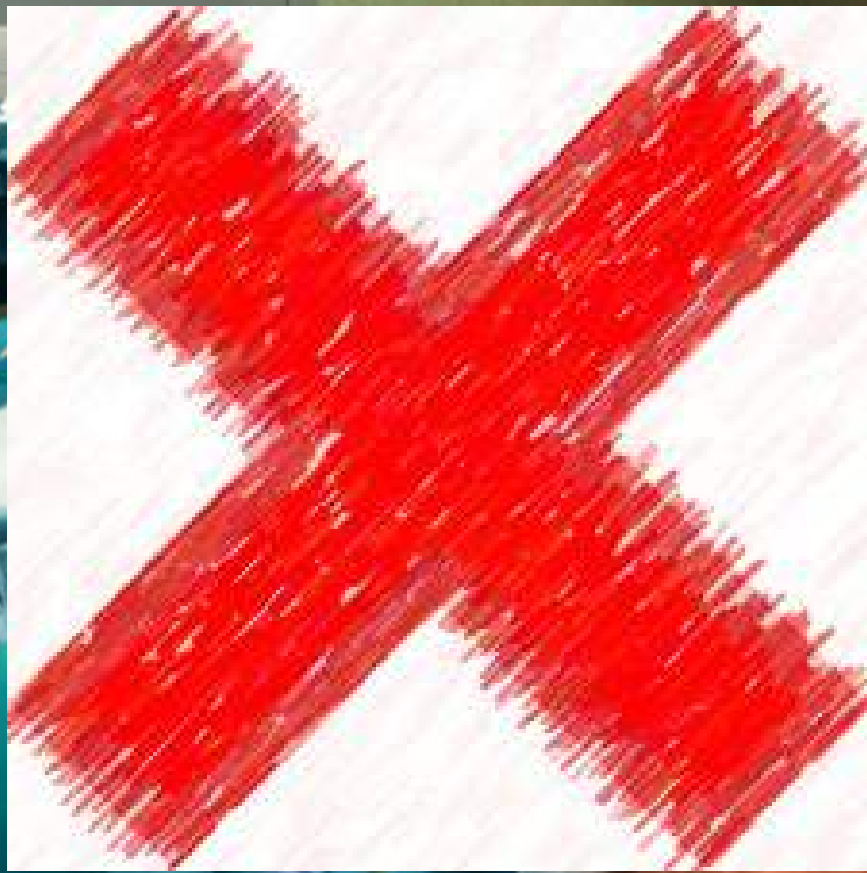


US-GUIDED CAUDAL BLOCK



Anatomy, riduzione passaggi dell'ago, maggior successo al primo tentativo, visualizzazione spread AL, successo del blocco invariato





PERIDURALE LOMBARE E TORACICA



PERIPHERAL BLOCK

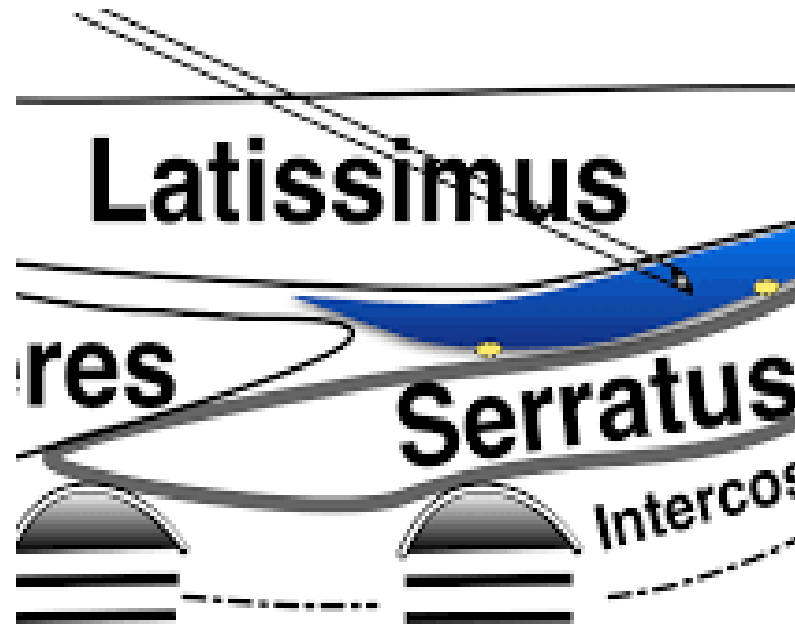
FASCIAL PLANE BLOCKS

PERIPHERAL LIMB BLOCKS





FASCIAL PLANE BLOCKS



SERRATUS BLOCK

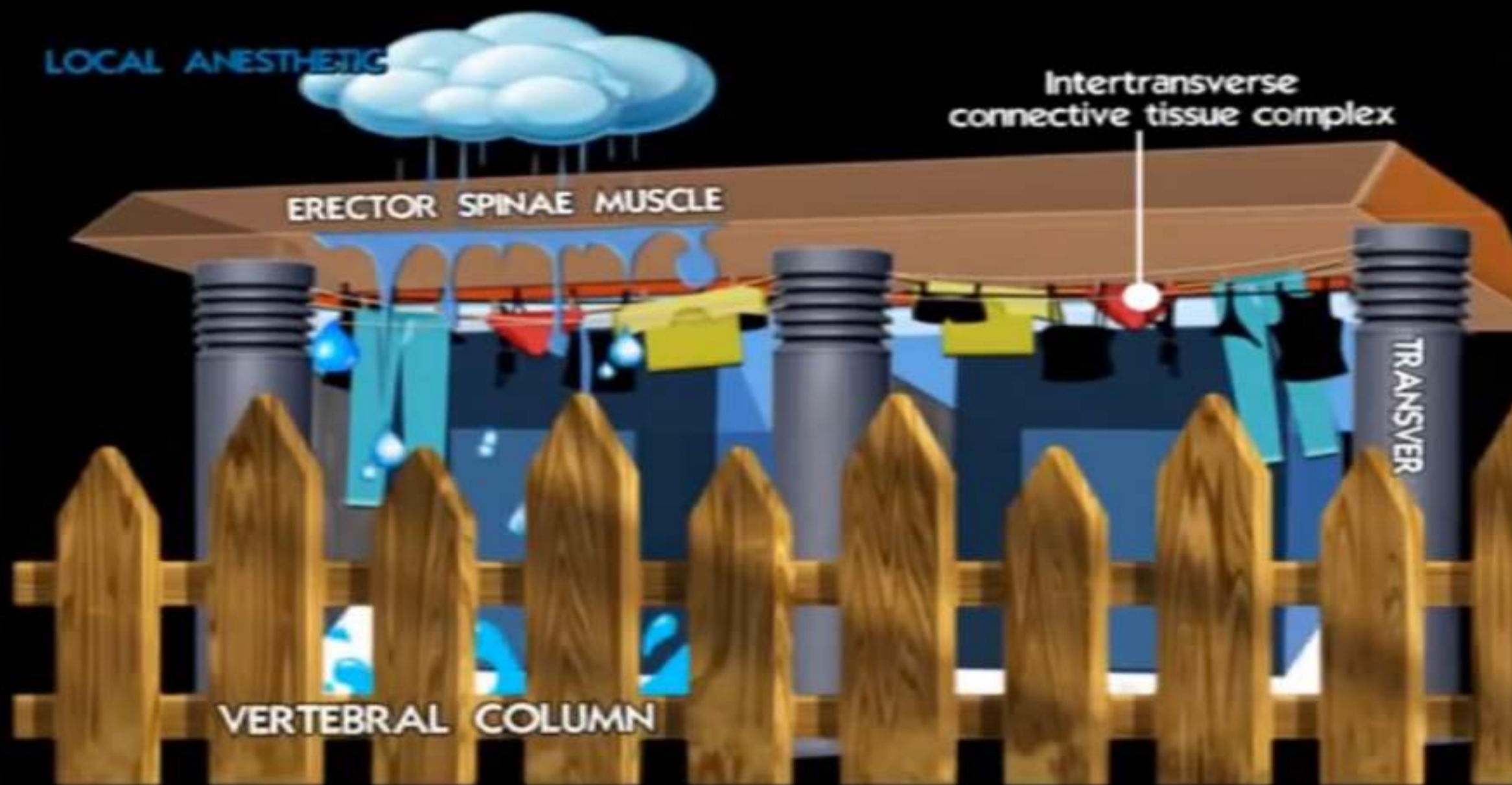
LOCAL ANESTHETIC

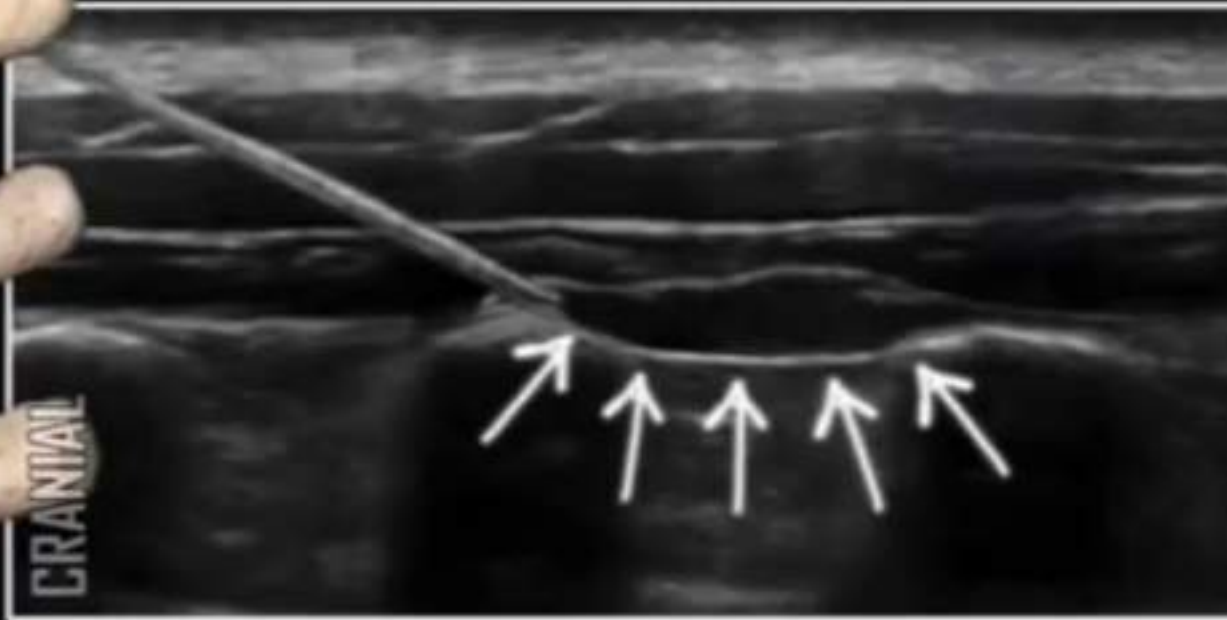
ERECTOR SPINAE MUSCLE

Intertransverse
connective tissue complex

TRANSVER

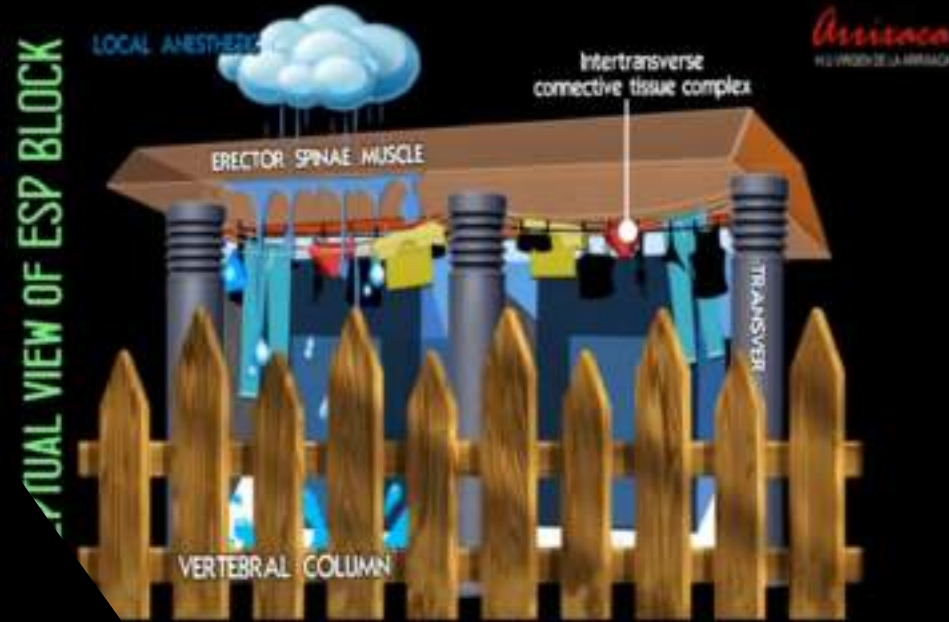
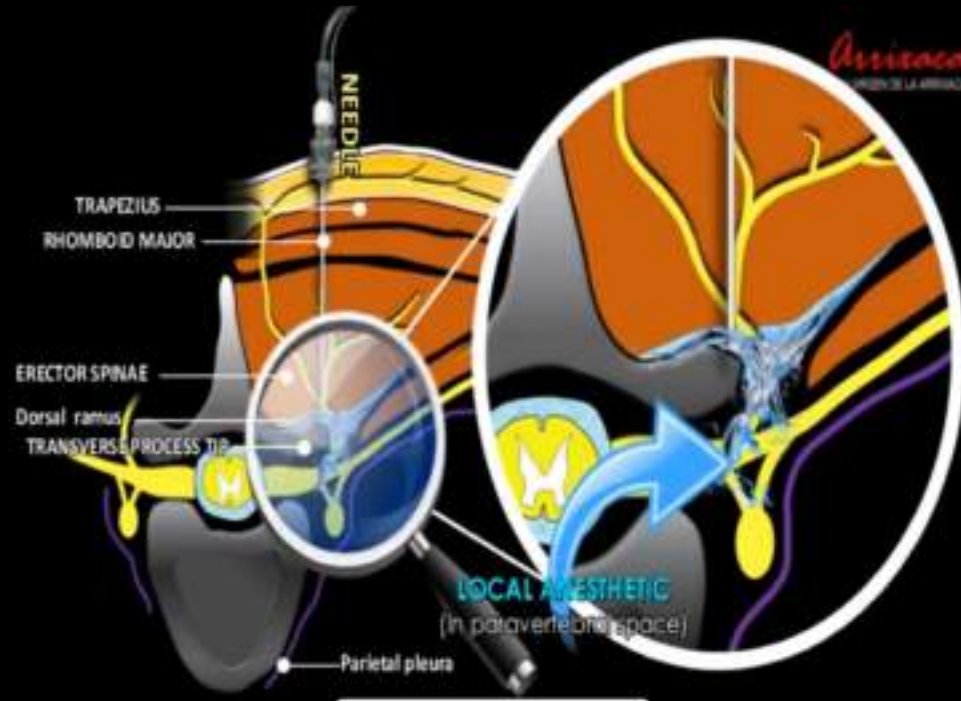
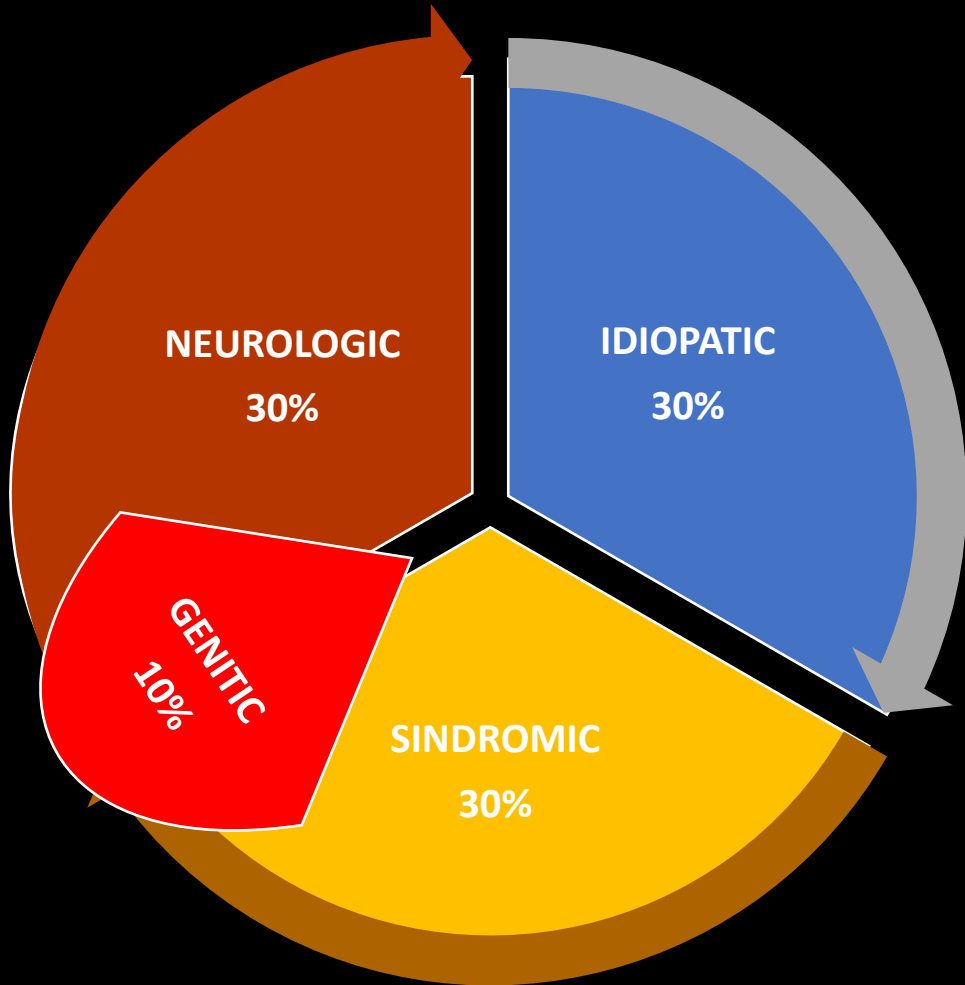
VERTEBRAL COLUMN





Inject 0.5-1 mL of non-active flu
confirm correct needle tip
position by visualizing spread un
erector spinae muscle.

SCOLIOSI

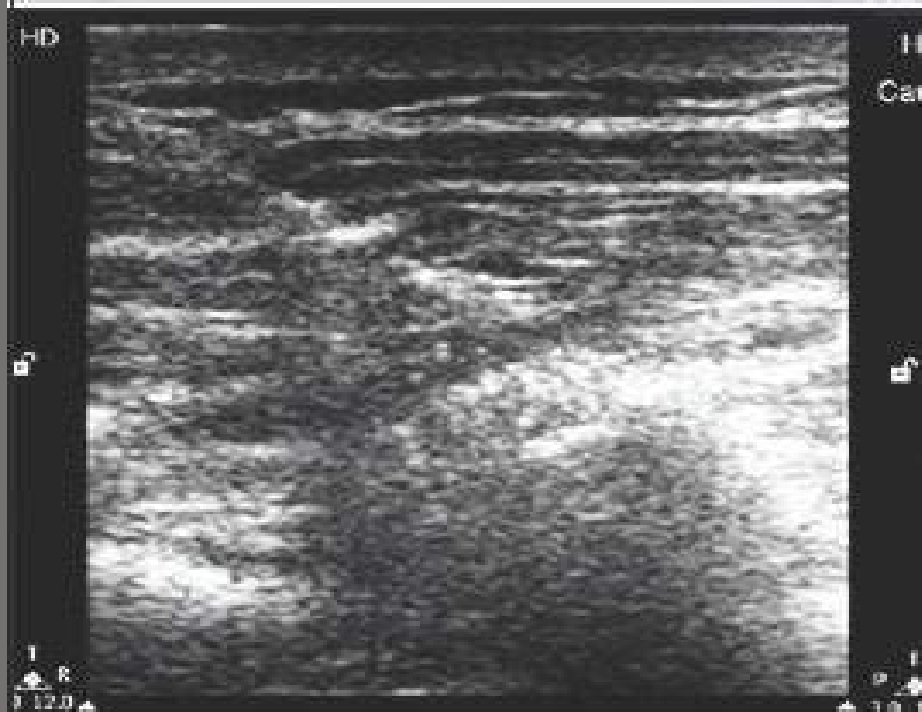
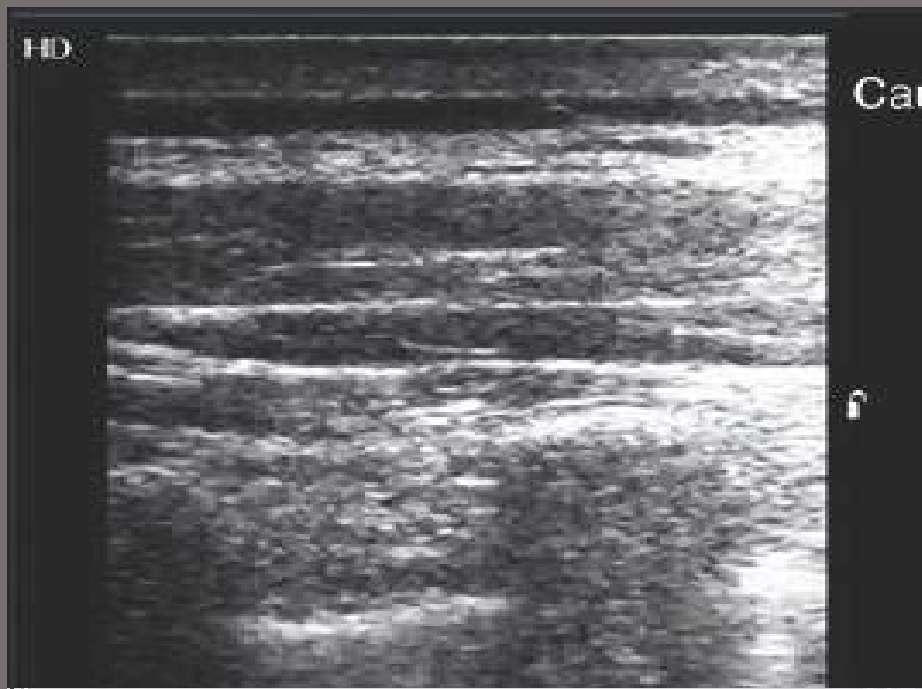


E

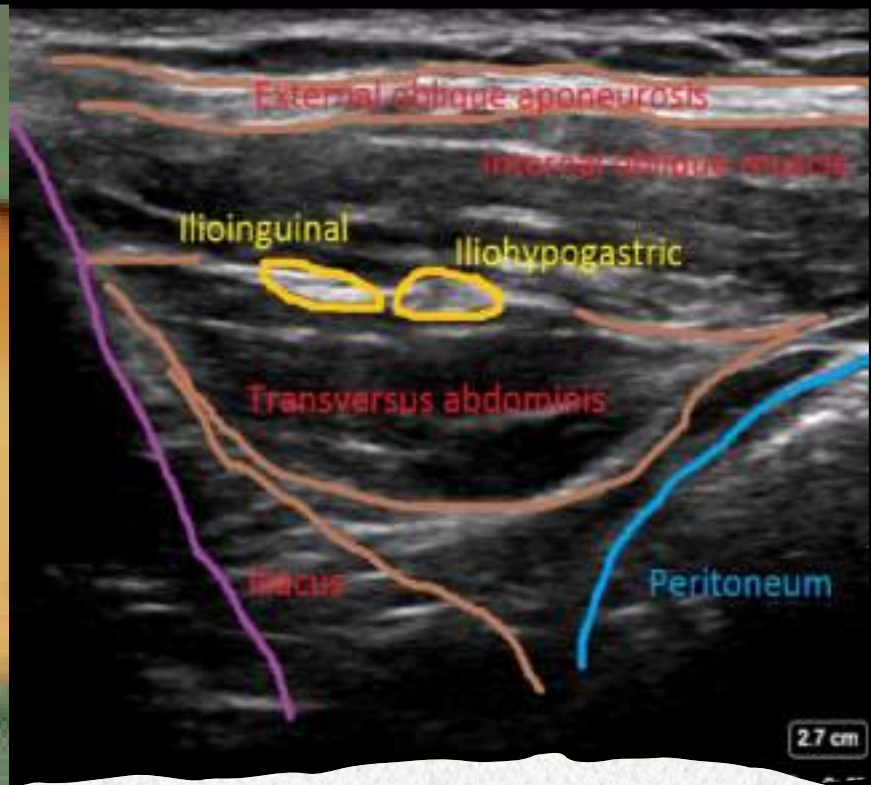
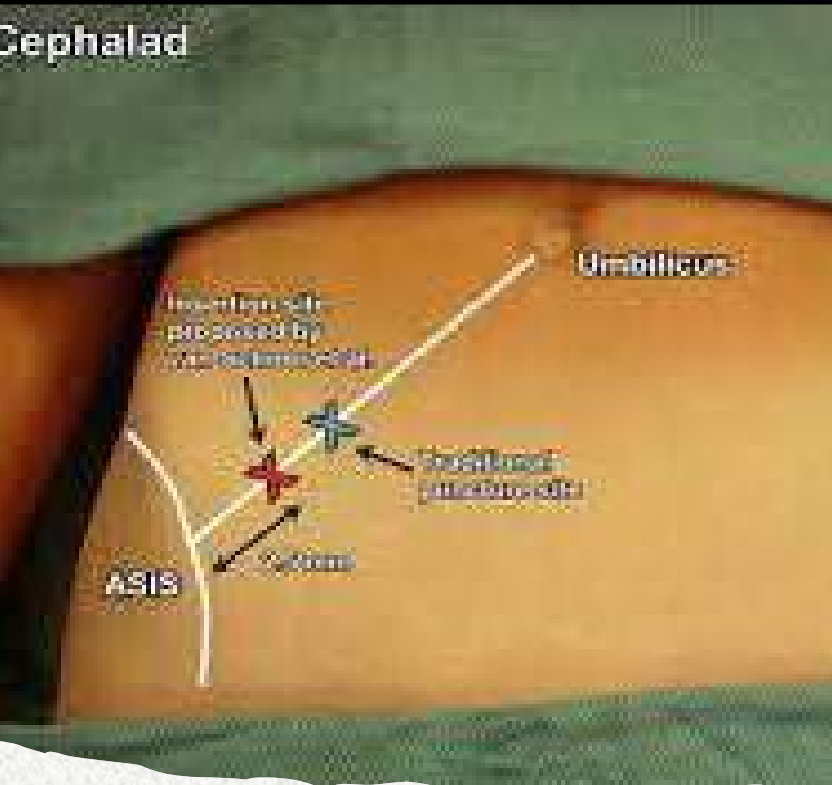
S

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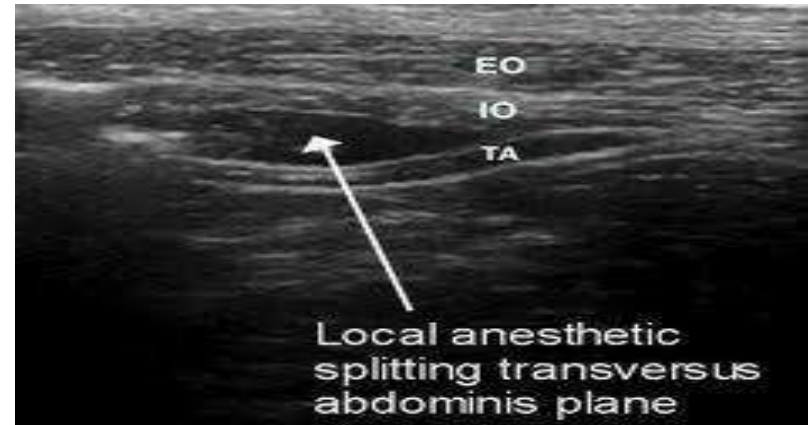
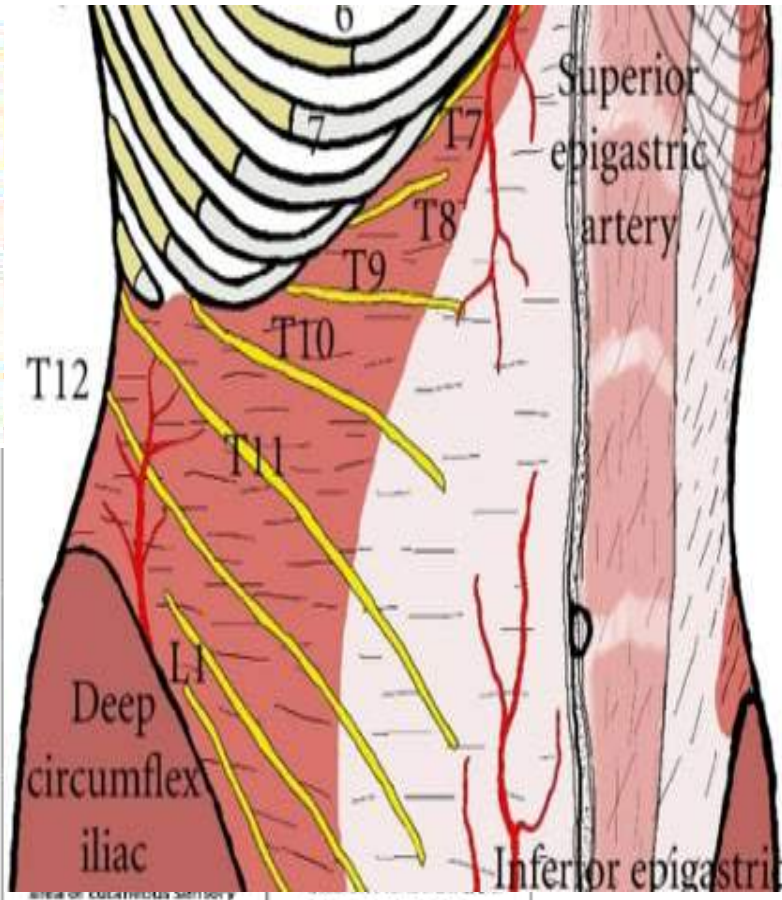
ESP BLOCK



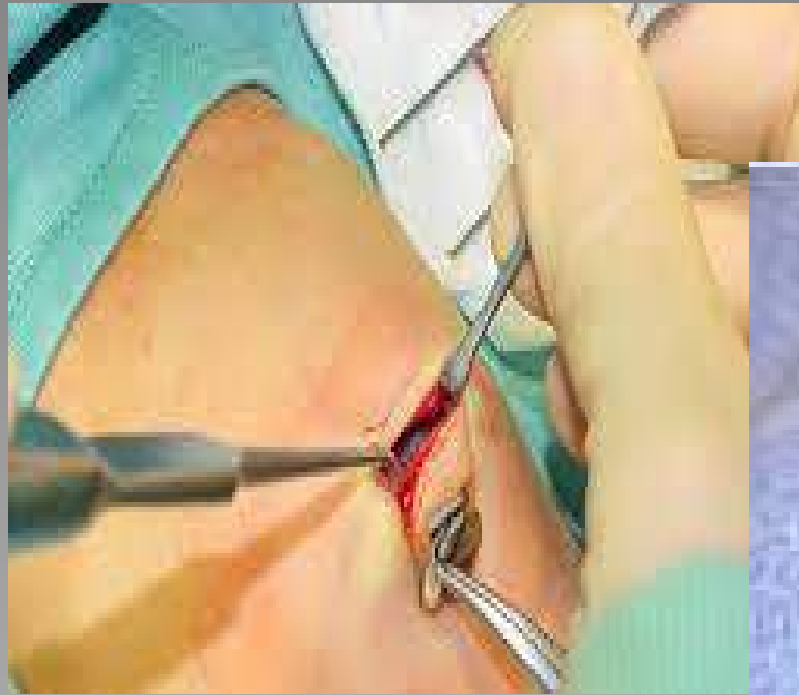
Cephalad



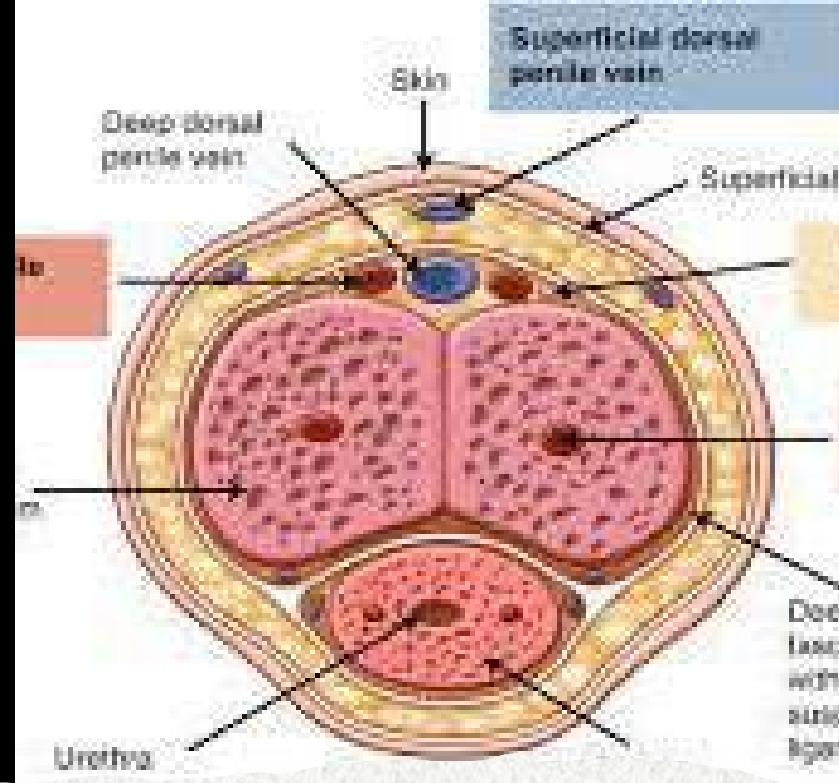
ILEOINGUINAL-ILEOPOGASTRIC BLOCK



TAP Block



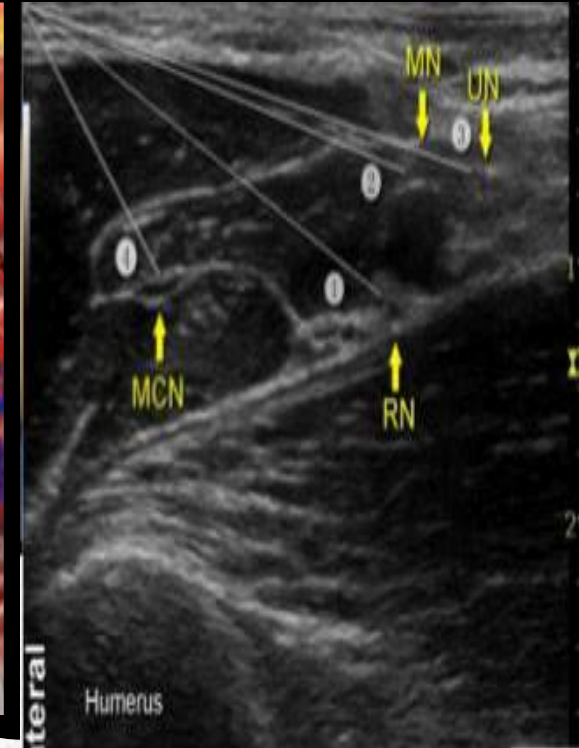
RECTUS SHEATH BLOCK



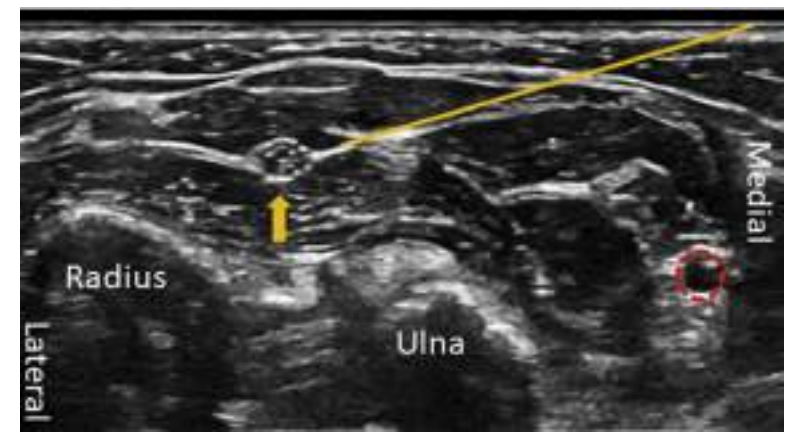
PENILE BLOCK

SAFETY

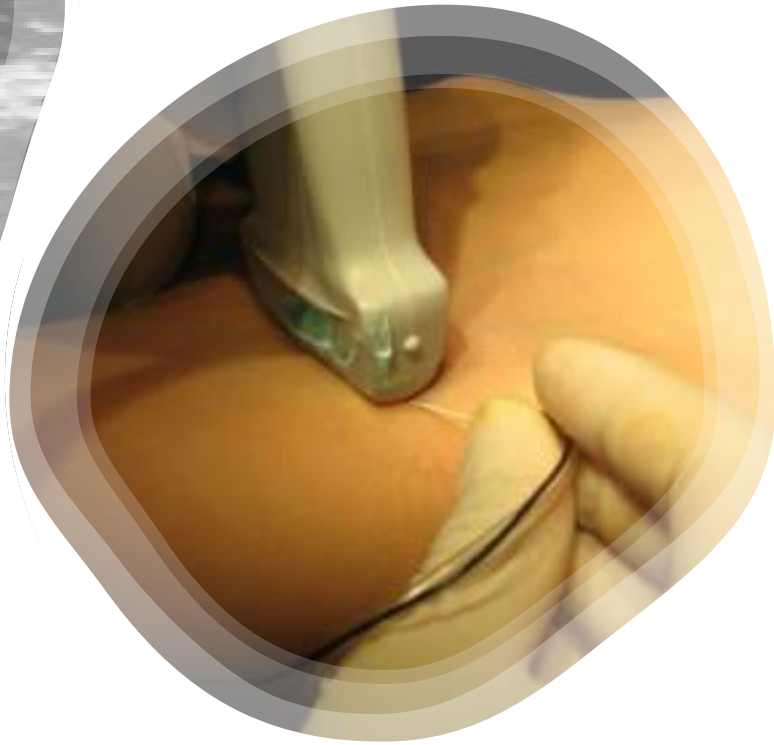
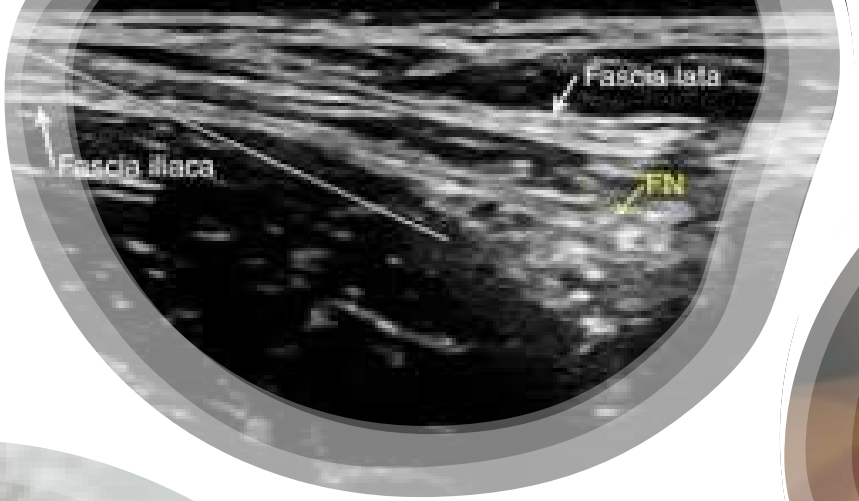




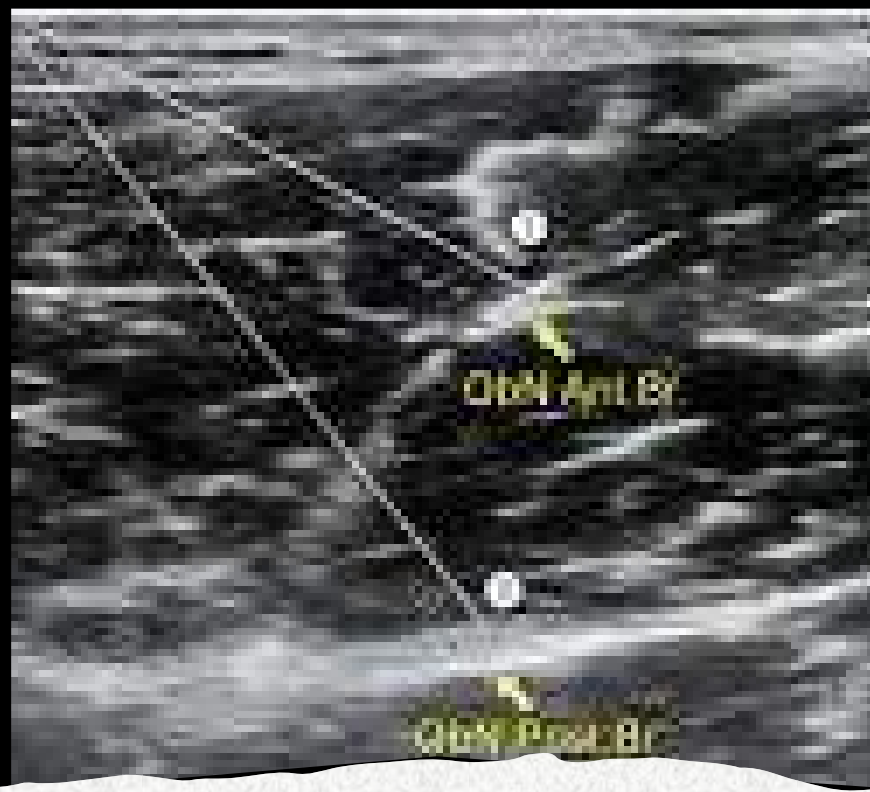
AXILLARY BLOCK



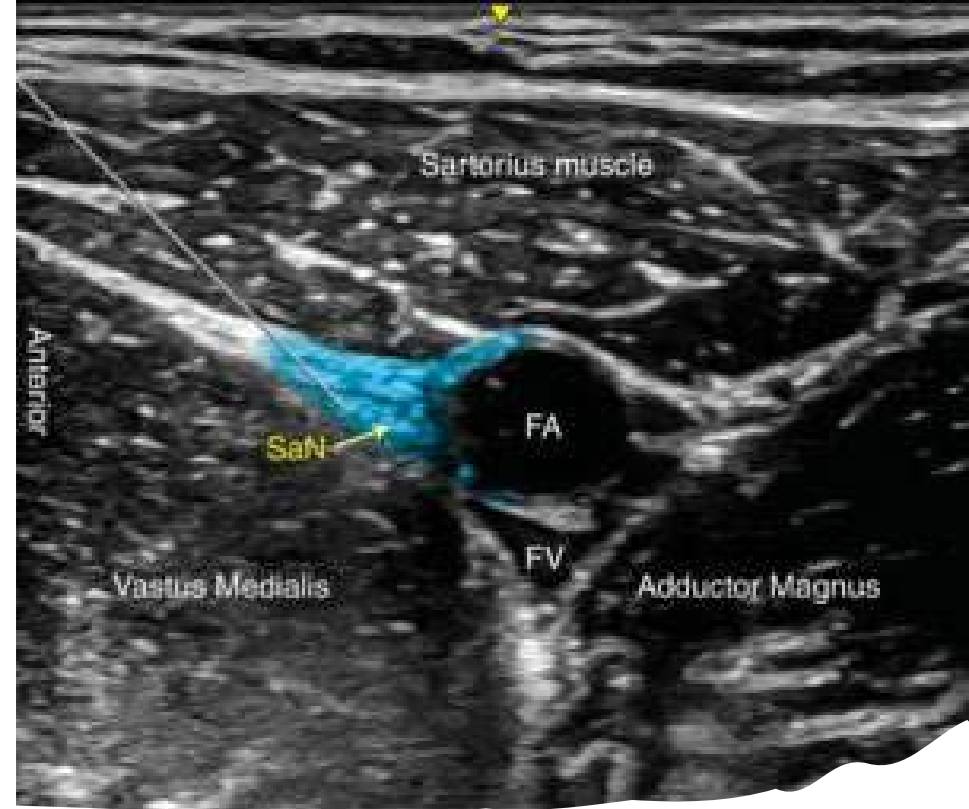
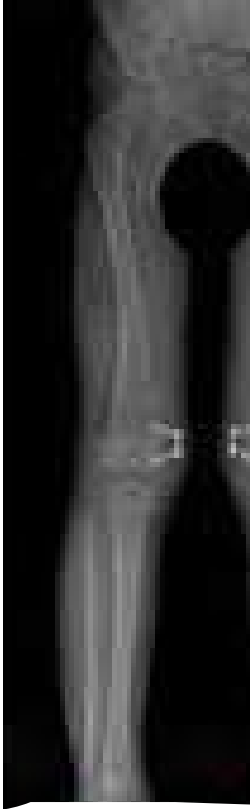
FOREARM BLOCK



FEMORAL NERVE BLOCK



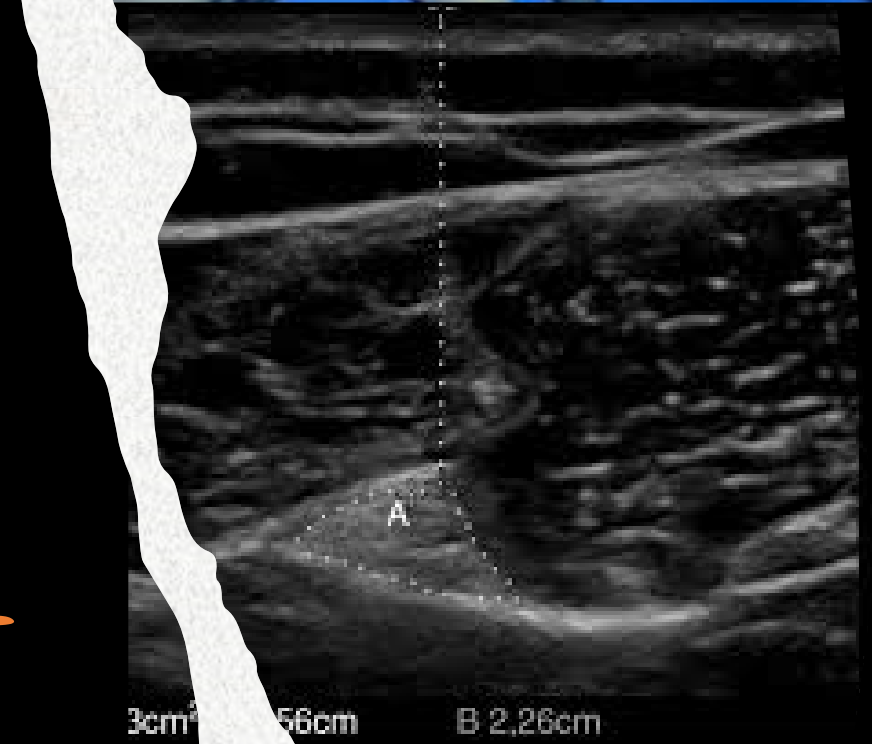
OBTURATOR NERVE BLOCK



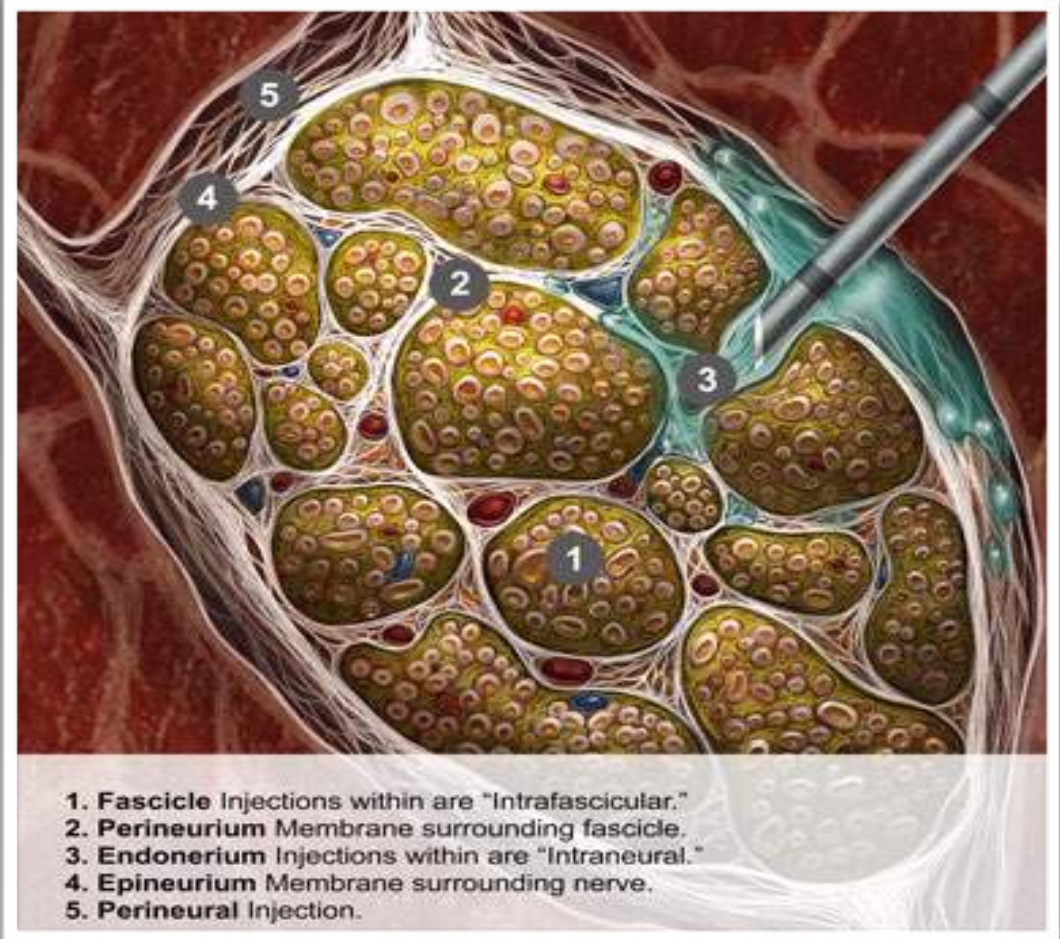
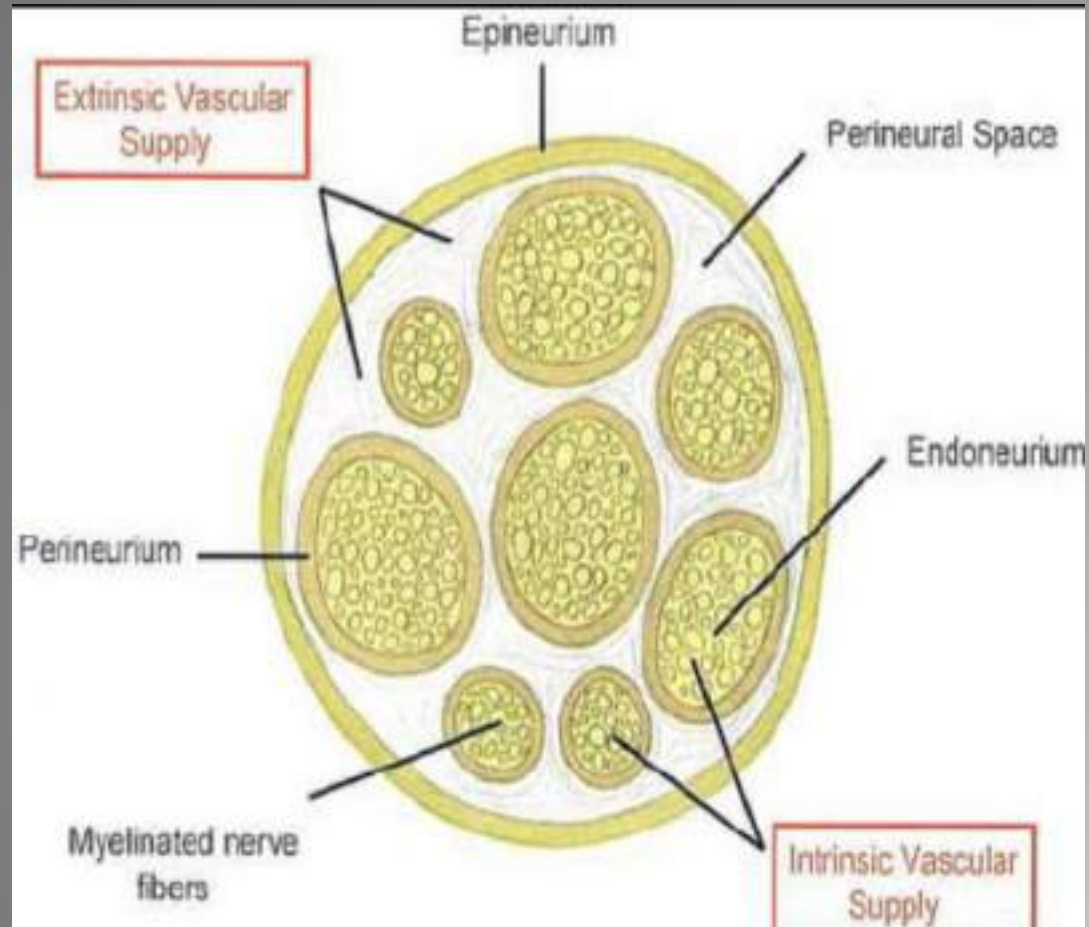
ADDUCTOR CANAL BLOCK



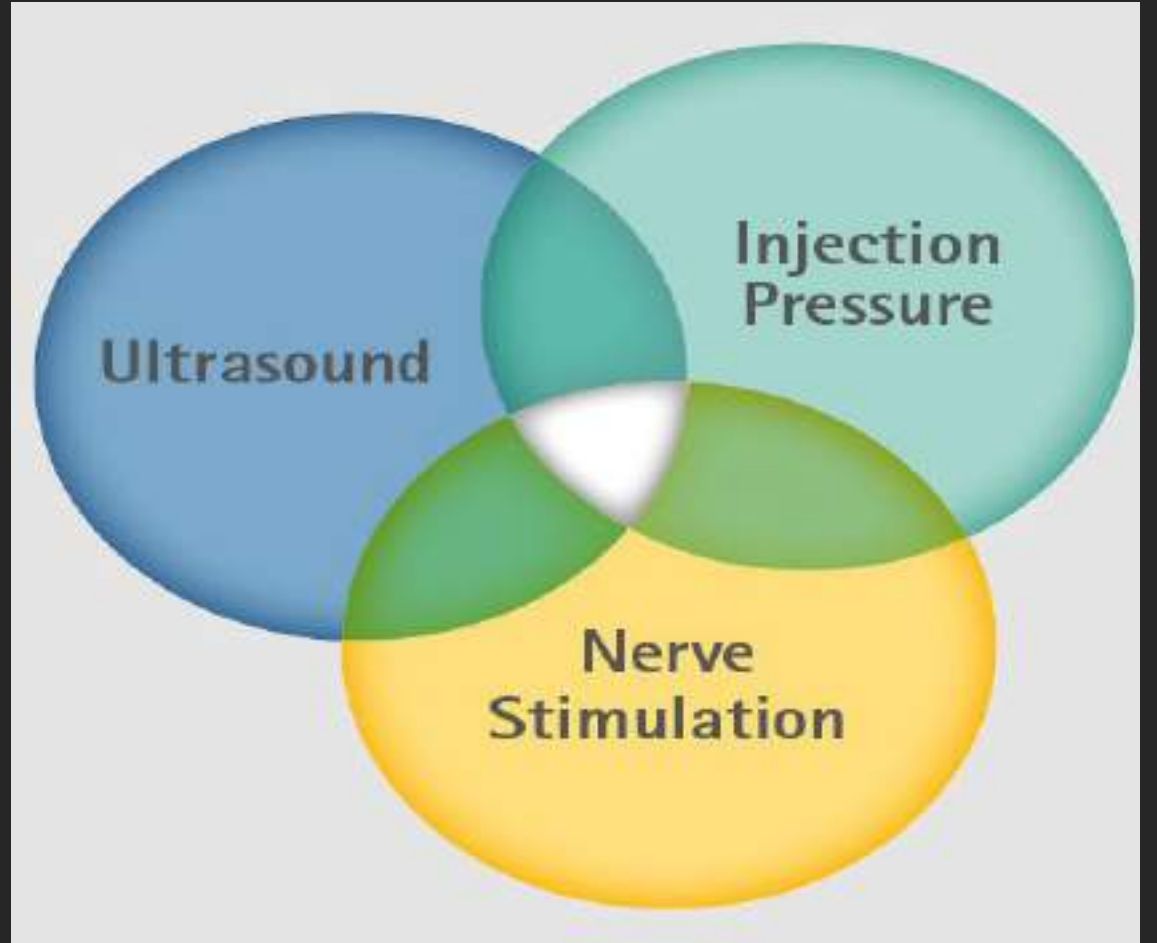
SCIATIC NERVE BLOCK



LOCAL ANESTHETIC INJECTION



SAFETY



TAKE HOME MESSAGE

SAFETY IN INFANT & CHILDREN

DO REGIONAL ANESTHESIA

ULTRASOUND

EXPERTISE

GUIDELINES



GRAZIE

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