

اسم المادة و الكورس

REGIONAL ANAESTHESIA

Sawa University

جامعة ساوة الاهلية

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كلية التقنيات الصحية والطبية

Department of Anesthesia

قسم تقنيات التخدير

.....3dr..... Stage

المرحلة الثالثة

محاضرة رقم 1.

Lecture No. 1

الجانب العملي

Practical

استاذ المادة : د. زهراء زهير

Regional anaesthesia (spinal, epidural, nerve block)

- **Regional anesthesia** is the use of local anesthetics to block sensations of pain from a large area of the body, such as an arm or leg or the abdomen.

Regional anesthesia allows a procedure to be done on a -
.region of the body without the patient being unconscious

:indications of regional anesthesia

To avoid some of the dangers of general - 1
anesthesia

Patients who specifically request regional - 2
.anesthesia

.To provide postoperative pain relief - 3

Relative contraindications for regional :anesthesia

.Uncooperative or restless patients

.Some psychiatric patients

:Major types of regional anesthesia include

:A) Peripheral nerve blocks

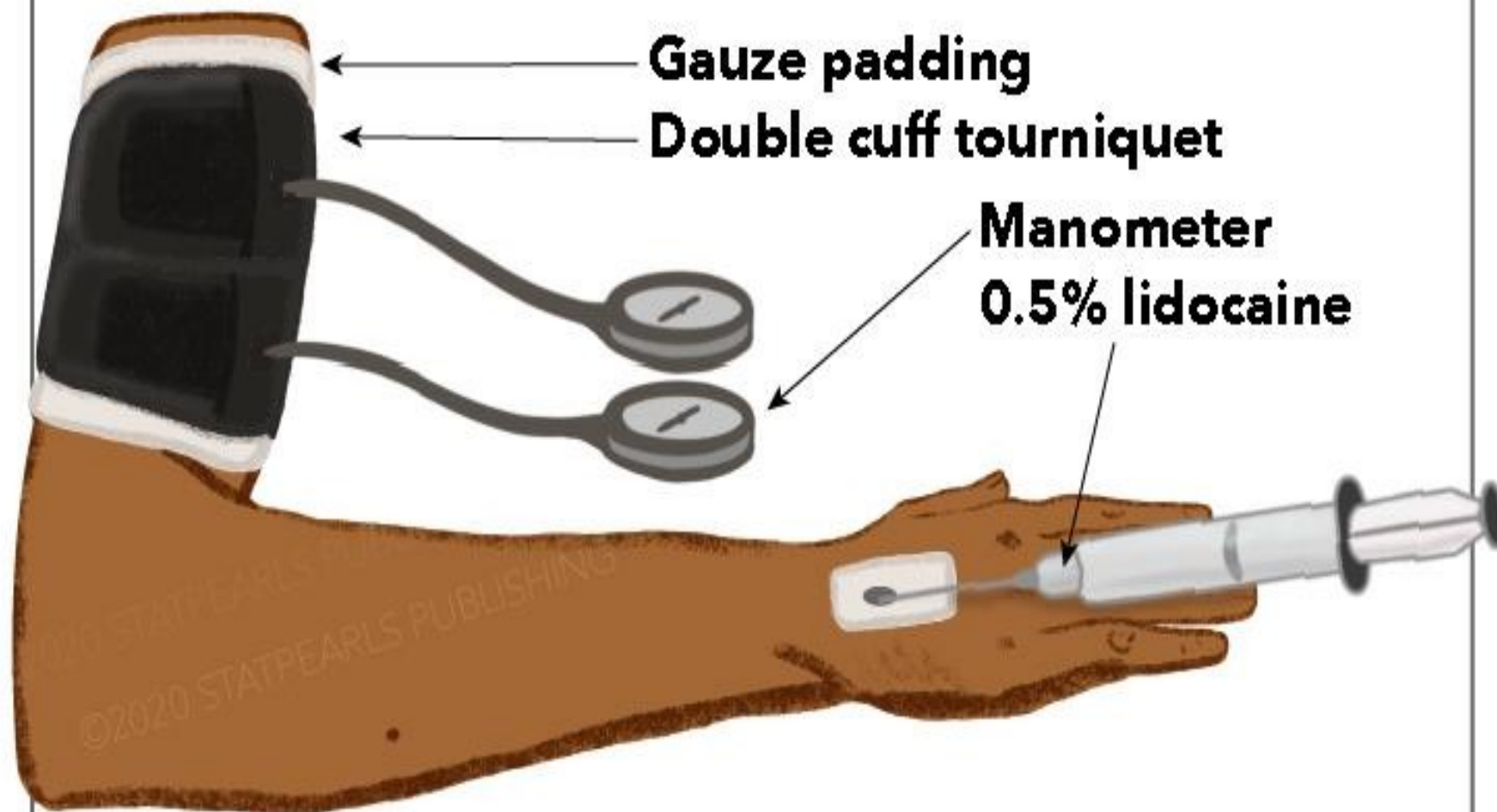
A local anesthetic is injected near a specific nerve or bundle of nerves to block sensations of pain from the area of the body supplied by the nerve

:B) - INTRAVENOUS REGIONAL ANESTHESIA – BIER'S BLOCK

Bier's block is one of the peripheral nerve block techniques performed on the body extremities, it is ideally suited to operations of the distal arm or leg (i.e., below the elbow or knee. IVRA is useful for only short surgical procedures; **performed in 40 minutes or less** (the length of operating time is limited by tourniquet pain, which usually develops after **40 to 60 minutes**

First of all, the target region exsanguinated to force blood out of the extremity followed by the application of pneumatic single or double tourniquet inflated 100mmHg above the patient's systolic blood pressure to safely stop blood flow. The anesthetic agent is intravenously introduced into the limb and allowed to diffuse into the surrounding tissue while .tourniquets retain the agent within the desired area

Bier Block



Two intravenous cannulas should be placed, one for venous cannulation distal to the tourniquet and one for cannulation in a non-targeted arm to allow access to the circulation if required in the event of complications

The dose required in Bier's block is about 3 – 4 mg/ kg of 0.5% plain solution, (without adrenaline) of lidocaine or prilocaine

while bupivacaine should never be used due to its cardiotoxicity (leading to ventricular arrhythmias and death)

:Contraindications

Crush injury to the limb, IVRA may provoke further tissue damage secondary to - 1 hypoxia

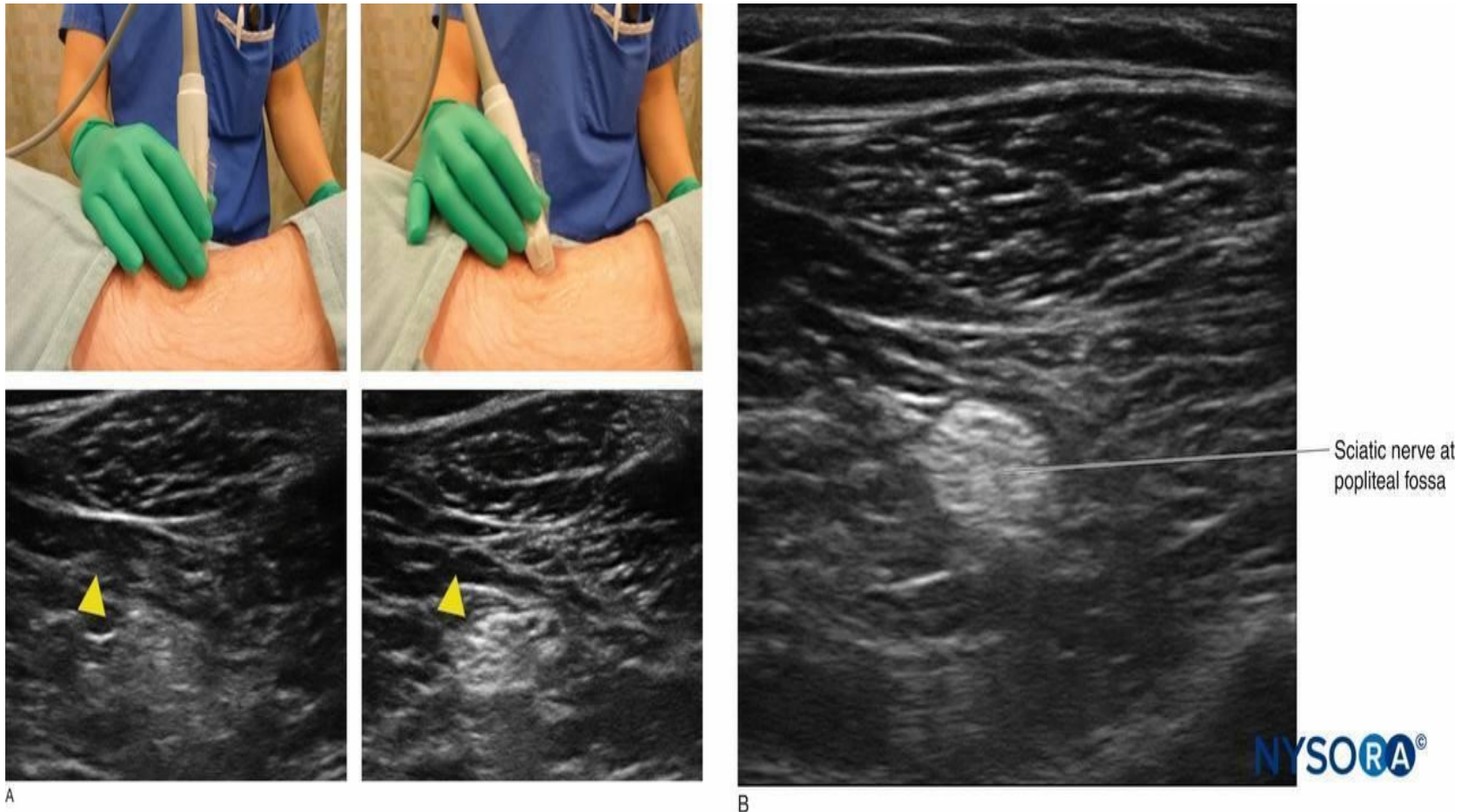
.Reynold's disease (intermittent arteriolar vasospasm of the distal limbs) - 2

.Sickle cell anemia - 3

⁶.Scleroderma - 4

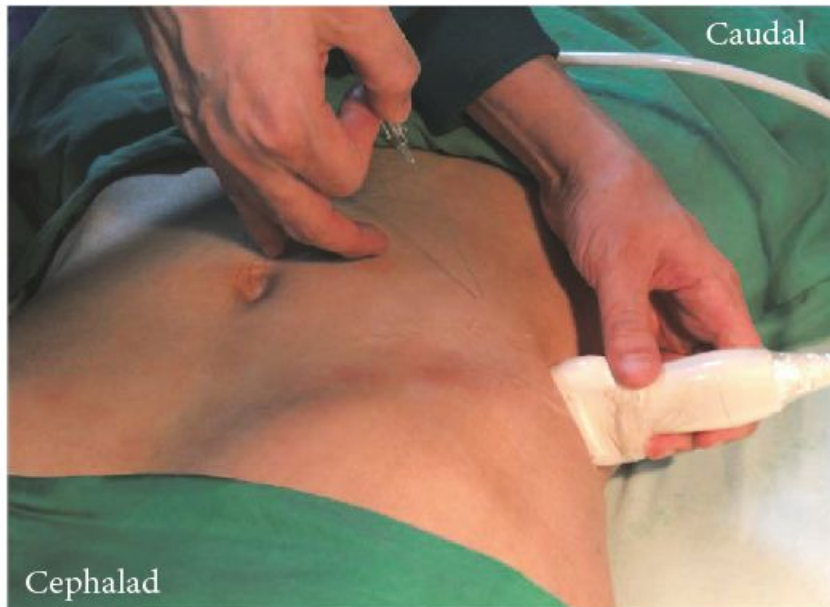
Ultrasound guided regional anesthesia (USGRA)

- Ultrasonography (US) as a means to guide peripheral nerve blockade (PNB) was first explored by anesthesiologists at the University of Vienna in the mid-1990s.

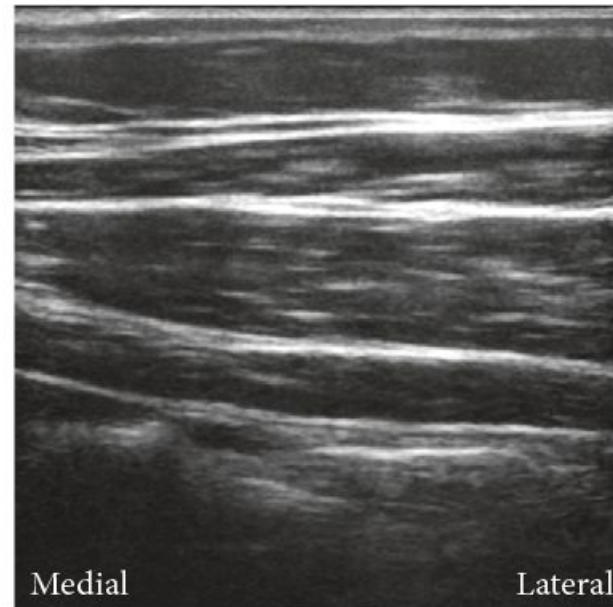


: The Transversus Abdominis Plane (TAP) Block

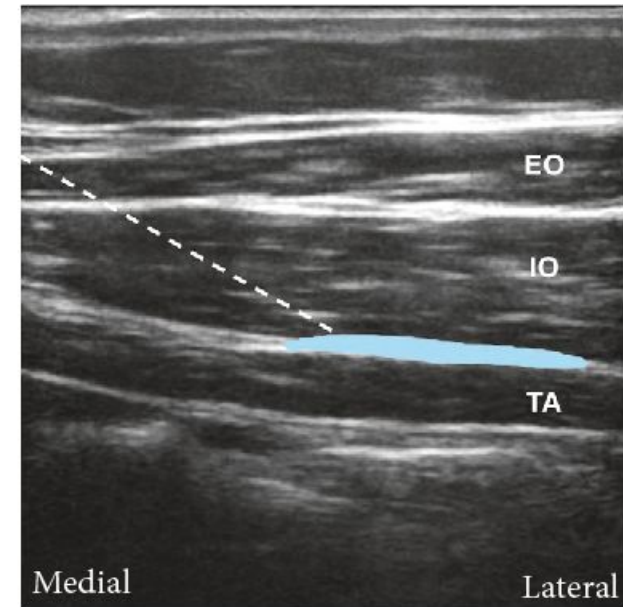
- INDICATIONS •
- ANAESTHESIA AND ANALGESIA OF THE SOMATIC ABDOMINAL WALL FROM THE PUBIS TO THE LEVEL OF THE UMBILICUS WITHOUT NEURAXIAL BLOCKADE •*
ABDOMINAL WALL OPERATIONS (LAPAROTOMY, APPENDICECTOMY, HERNIA REPAIRS, CAESAREAN SECTION, AND HYSTERECTOMY).



(a)



(b)

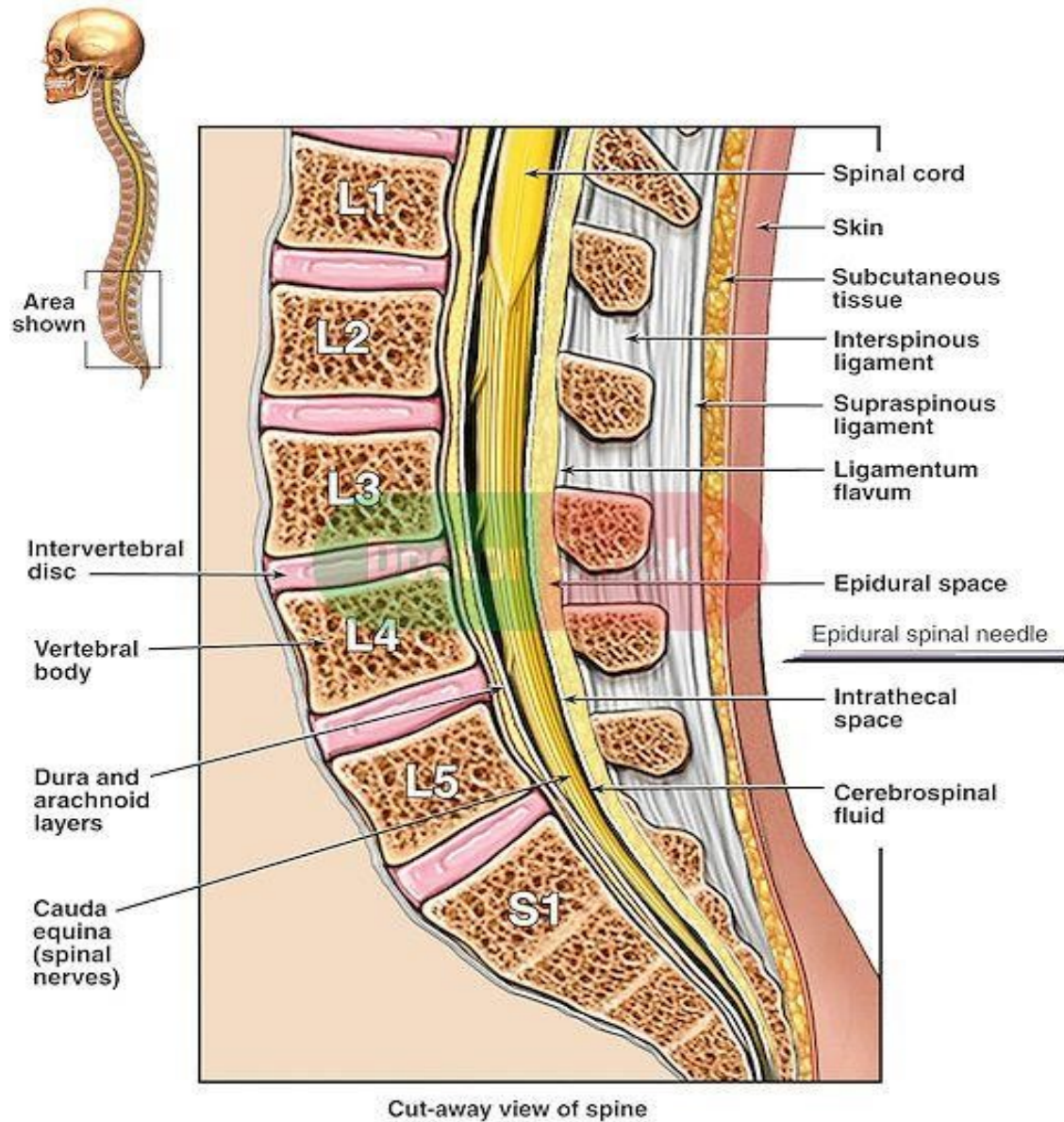


: Spinal anesthesia

A local anesthetic is injected near the spinal cord and major nerves that enter the spinal cord to block sensations of pain from an entire region of the body, such as the lower abdomen, the hips, or the legs

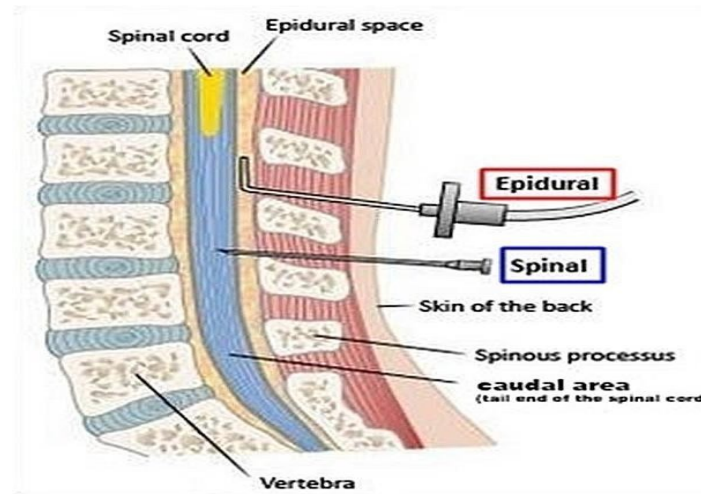
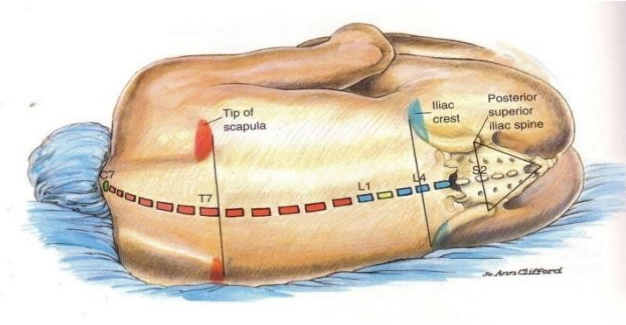
The spinal cord usually ends at the level of L1 in adults and L3 - in children.

- Dural puncture above these levels is associated with a slight risk of damaging the spinal cord and is best avoided. An important landmark to remember is that a line joining the top of the iliac crests is at L4 to L4/5



Surface anatomy

- Spinous process of T7 – inferior angle of scapula
- Tuffier's line – body of L4 or L4-L5 interspace



Indications & Advantages

Surgeries of lower limbs, perineum, pelvis, abdomen It is ideal in ☐
,Renal failure greater by two or three segments
duration is shorter ☐
Cardiac disease ☐
Liver disease • ☐
Obstetric anaesthesia • ☐
Full stomach ☐
Anatomic distortions of upper airway ☐
TURP surgery ☐

: Levels of block

Sympathetic paralysis ---> Sensory block ---> Motor nerve block



:Complications

Immediate complications *

Hypotension -

.Bradycardia and Cardiac arrest -

.High and Total spinal block leading to respiratory arrest -

.Urinary retention -

.Epidural hematoma, Bleeding -

Late complications *

Post dural puncture headache (PDPH)-

Backache-

Nausea -

Focal neurological deficit -

Bacterial meningitis -

Sixth Cranial nerve palsy - -

Urinary retention - -

:Cardiovascular Effects

Blockade of Sympathetic Preganglionic Neurons ?

Send signals to both arteries and veins ?

? Predominant action is venodilation

:Reduces

Venous return ?

Stroke volume ?

Cardiac output ?

Blood pressure ?

T1-T4 Blockade ?

Causes unopposed vagal stimulation ?

Bradycardia ?

Associated with decrease venous return & cardioaccelerator fibers blockade ?

14 Decreased venous return to right atrium causes decreased stretch receptor response ?

:Hypotension

Treatment ?

Best way to treat is physiologic not pharmacologic ?

: Primary Treatment

Increase the cardiac preload ?

Large IV fluid bolus within 30 minutes prior to spinal placement, minimum 1 liter of ?
crystalloids

: Secondary Treatment

Pharmacologic ?

Ephedrine is more effective than Phenylephrine ?

:Respiratory System

Appropriate spinal blockade has little effect on ventilation [?]

High Spinal [?]

Decrease functional residual capacity (FRC) [?]

Paralysis of abdominal muscles [?]

Intercostal muscle paralysis interferes with coughing and clearing secretions [?]

Apnea is due to hypo perfusion of respiratory center [?]

:Spinal headache

More common in women ages 13-40 [?]

Larger needle size increase severity [?]

Onset typically occurs first- or second-day post-op [?]

:Treatment

Bed rest (remain lying flat in bed as this relieves pain) [?]

Fluids (drink freely or IV fluid to maintain hydration) [?]

Simple **analgesia** such as paracetamol, [?] **Caffeine** containing drink [?]

Blood patch [?]

Increase pressure of CSF by placing blood in epidural space [?]

May do no more than two [?]

success with first patch 95% [?]

¹⁷Second patch may be done 24 hours after first [?]

Epidural (extradural) anesthesia:

:Epidural space

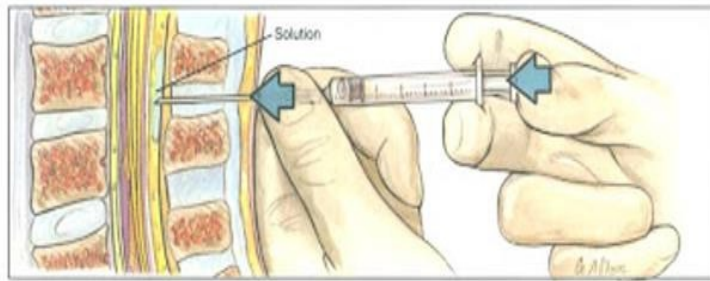
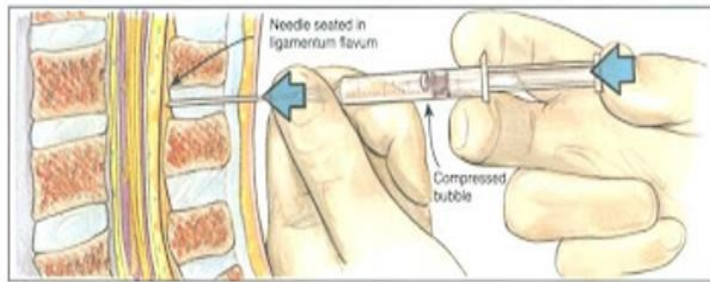
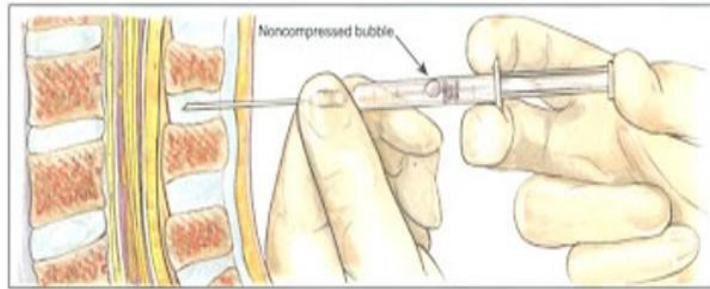
Potential space between the dura mater and ligament flavum Made up of -
vasculature, nerves, fat and lymphatic

Extends from foramen magnum to the sacrococcygeal ligament. Is segmented and -
not uniform in distribution

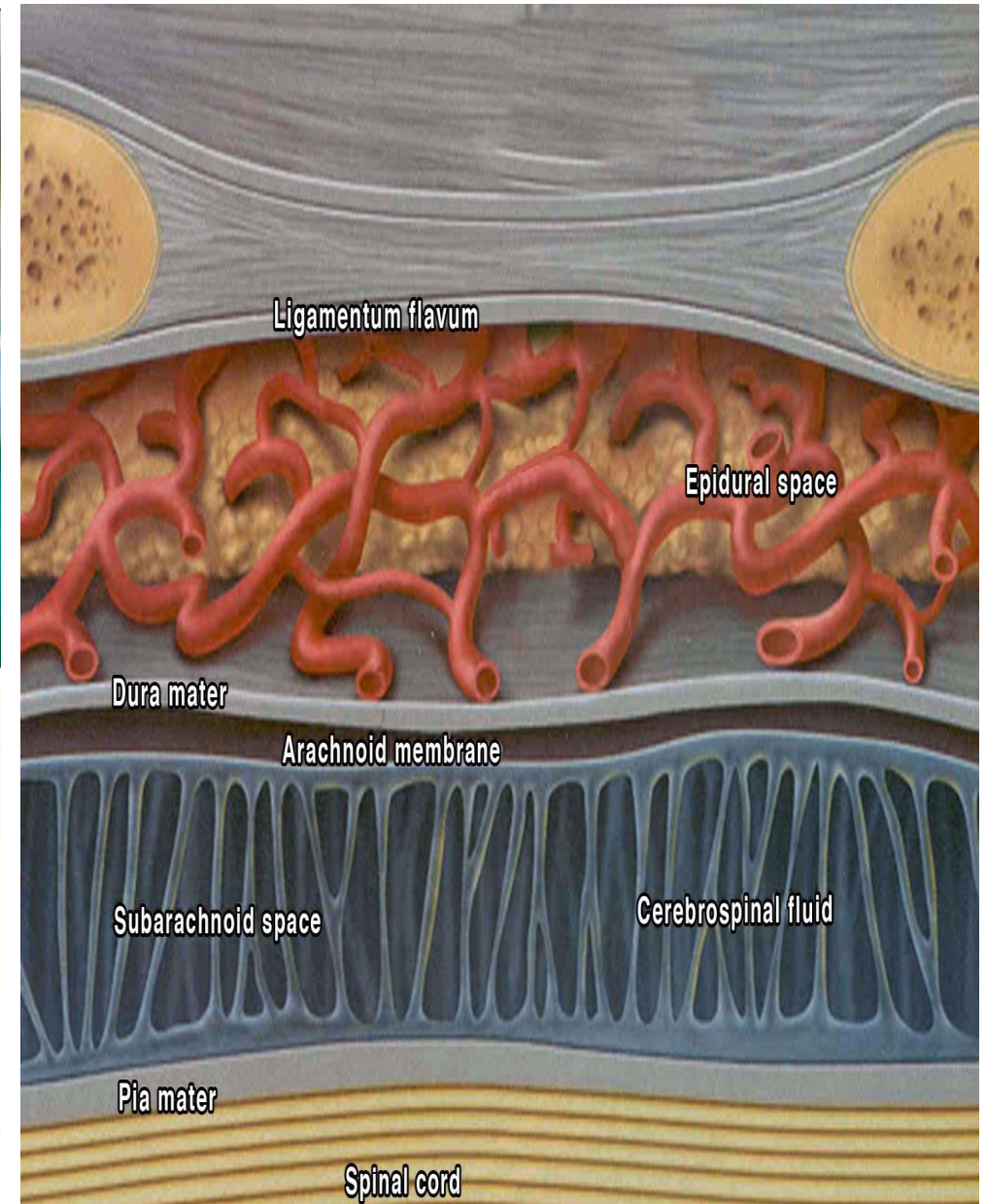
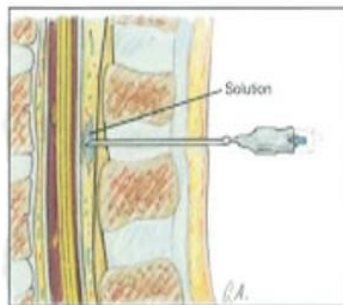
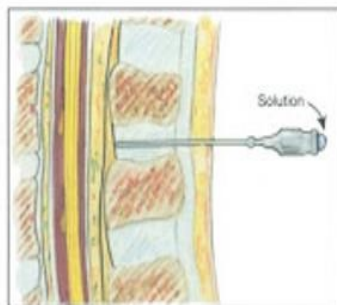
(cervical ,thoracic, lumber, Caudal) Epidural level

Widest at Level L2 (5-6mm) -

Narrowest at Level C5 (1-1.5mm Distances from Skin to Epidural Space -



A



Test Dose: 1.5% Lido with Epi 1:200,000

Tachycardia (increase >30bpm over resting HR) -

High blood pressure -

Light headedness -

Metallic taste in mouth -

Ring in ears -

- Facial numbness

Note: if beta blocked will only see increase in BP not HR -

:Contraindications to central neuraxial blockade

:Absolute

- .Raised intracranial pressure -
- .Coagulopathy, blood dyscrasias or full anticoagulant therapy -
- .Skin sepsis -
- .Marked spinal deformity -
- .Hypovolaemia -
- .Patient refusal -

:Relative

Mildly impaired coagulation, the risk of spinal hematoma should be weighed - against the benefits of avoiding general anesthesia in patients with patients with

- .platelets less than 80 000/ ml

Comparison between spinal anesthesia and epidural anesthesia

Spinal anesthesia	Epidural anesthesia
1) Drug delivered to the subarachnoid space and into the CSF	1) Drug delivered outside the dura (outside CSF)
2) Injected only below the 3 rd lumbar vertebra to avoid piercing the spinal cord	2) May be given at cervical, thoracic, lumbar or sacral sites
3) smaller dose injected	3) larger dose injected
4) onset: 2 – 5 minutes for initial effect, 20 minutes for maximum effect	4) onset: 5 – 15 minutes for initial effect, 30 – 45 minutes for maximum effect
5) cause a significant neuromuscular block (muscle relaxation)	5) Doesn't cause a significant neuromuscular block
6) Gives profound block of all motor and sensory function below the level of injection	6) Blocks a 'band' of nerve roots around the site of injection, with close-to normal function below the levels blocked.
7) almost always a one-shot only	7) an indwelling catheter may be placed that allows for repeated doses

Any questions?

*Thank
You*