

# REGIONAL ANAESTHESIA

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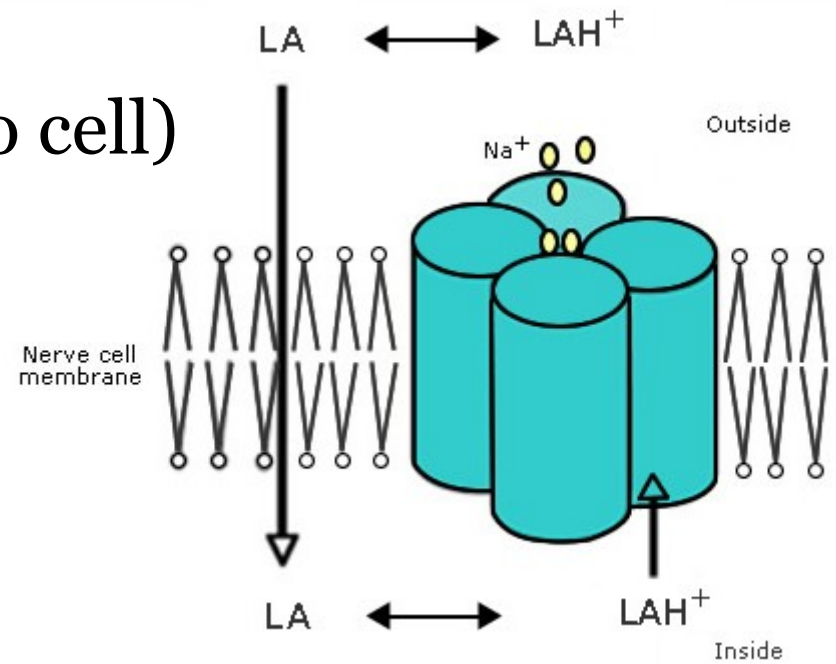
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# Anaesthesia = loss of sensation

- General (narcosis)
- Local / regional
- Combined

# Local anaesthetic

- Reversible block
- Sodium ion canal ( $\text{Na}^+$  to cell)



# Nerve fibre

- A: myelinated
  - $\alpha$  (alfa): motor function, reflex activity a proprioception
  - $\beta$  (beta): touch, pressure
  - $\gamma$  (gama): muscular tonus
  - $\delta$  (delta): PAIN and sense of heat
- B: thin, myelinated preganglion-nerve fibre, autonomic function, smooth muscle of vessels
- C: non-myelinated, PAIN

# Nerve block - signs

- (B fibre) block of sympathetic = heat
- (C + A $\delta$  fibre) block of pain and heat
- (A $\beta$ ) loss of touch sensation
- (A $\alpha$ ) motor block

# Local anaesthetics

Potentially toxic!

- CNS
  - Convulsion, coma, depression of breath!
    - Perioral tingling, iron taste, somnolence, vertigo, tinnitus (ringing), nystagmus, visual disturbance
- Cardiovascular system
  - Hypotension, bradycardia, collapse of circulation, asystole or ventricular fibrillation!

# Local anaesthetics

- Esters
- Amides
- **Examples:** lidokain, trimecain (Mesocain)  
bupivakain (Marcaine), prokain,  
artikain (Ultracain, Supracain),  
ropivakain (Naropin)



# When to use regional techniques

1. **Patient safety** – frail elderly, comorbidities
2. **Patient satisfaction** – ealy oral intake, no PONV, no sore throat
3. **Surgical outcome** - awake craniotomy

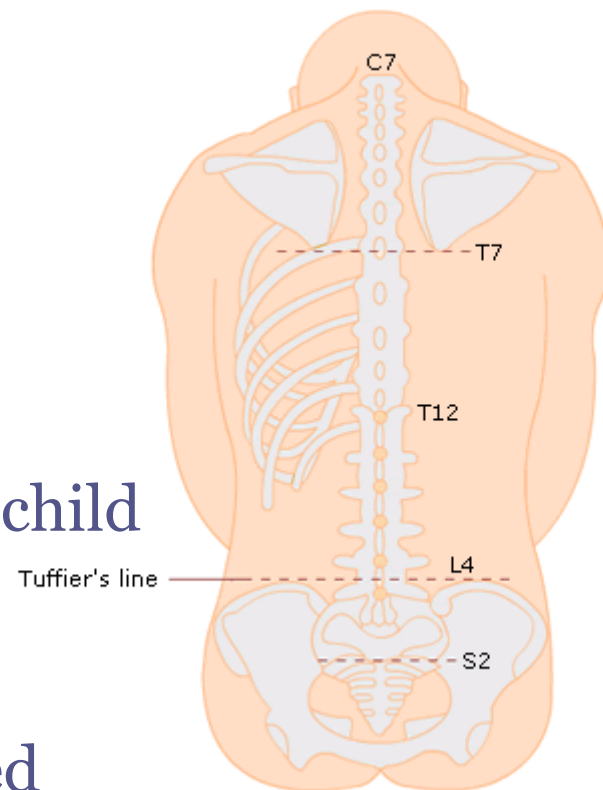


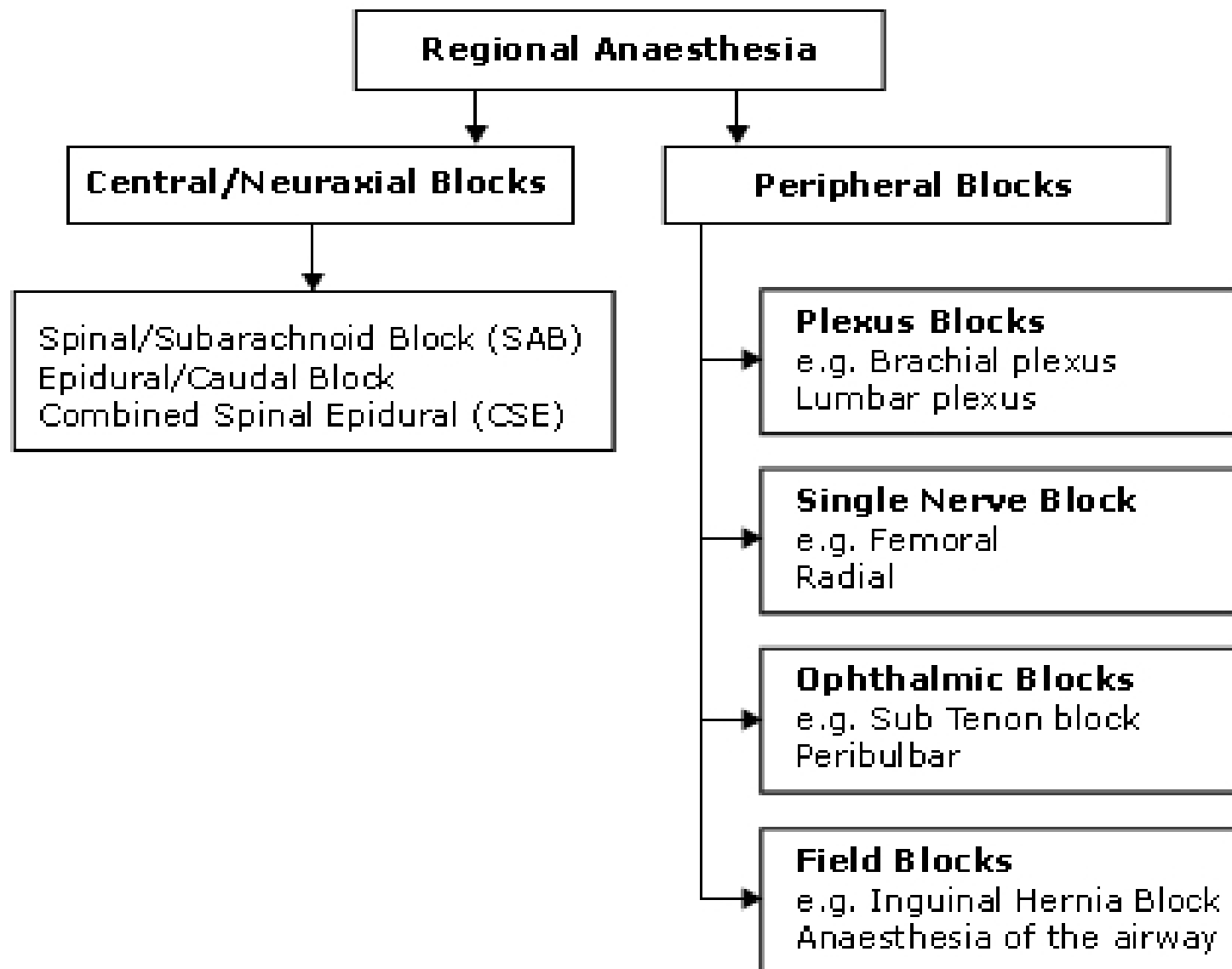


# Most common regional anaesthesia

## Caesarian section

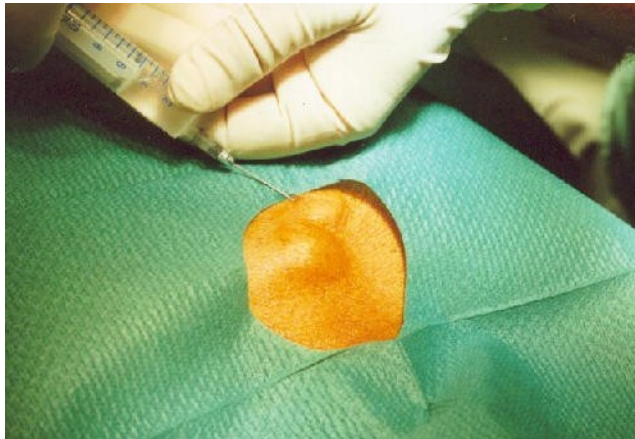
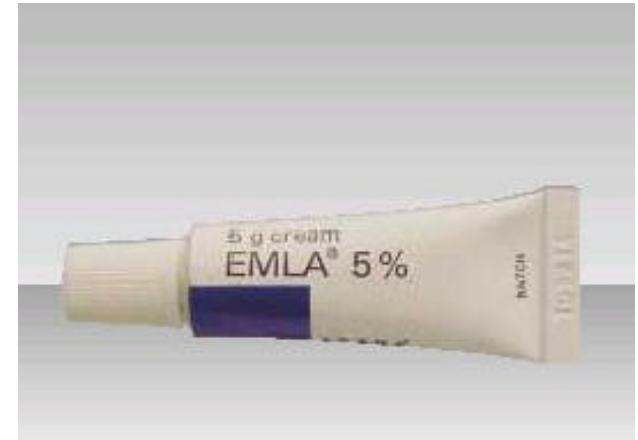
- Patient safety
  - Control of airway
- Patient satisfaction
  - Awake during the delivery of the child
  - Presence of partner
- Surgical outcome
  - Intraoperative bleeding is reduced
  - Reduced stress response





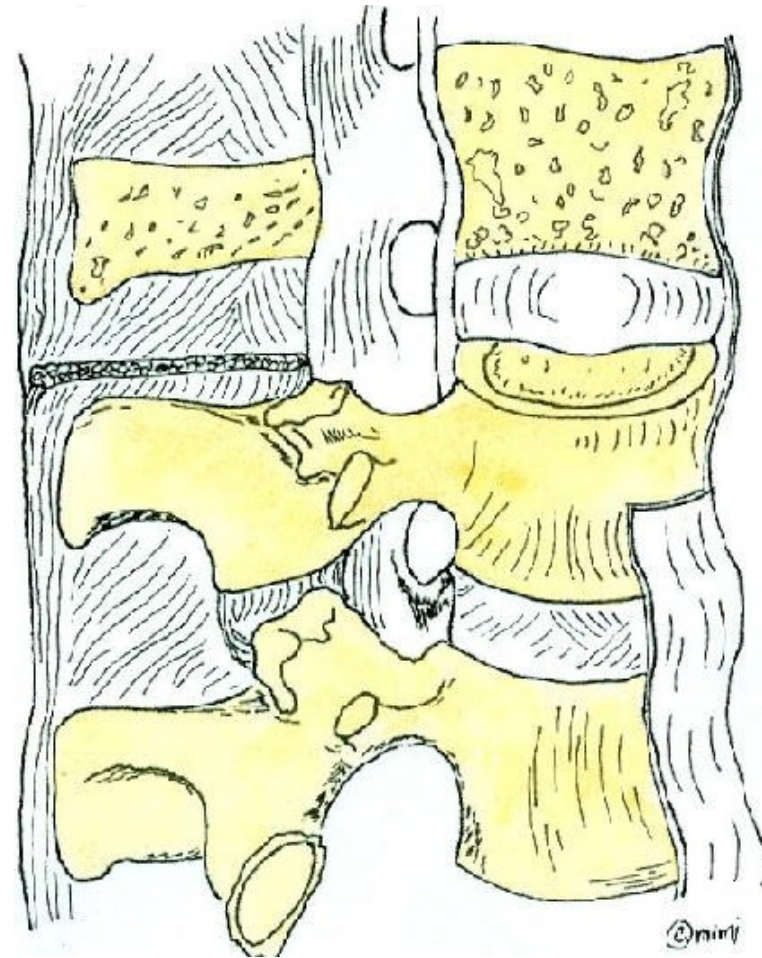
# Local anaesthesia

- **Local anaesthesia**
  - Superficial (topic, mucosa)
  - Infiltration



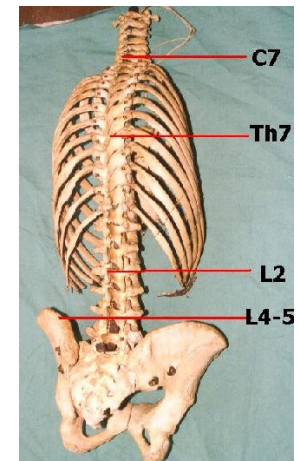
# Central neuroaxial block

- Epidural
- Subarachnoideal (spinal)

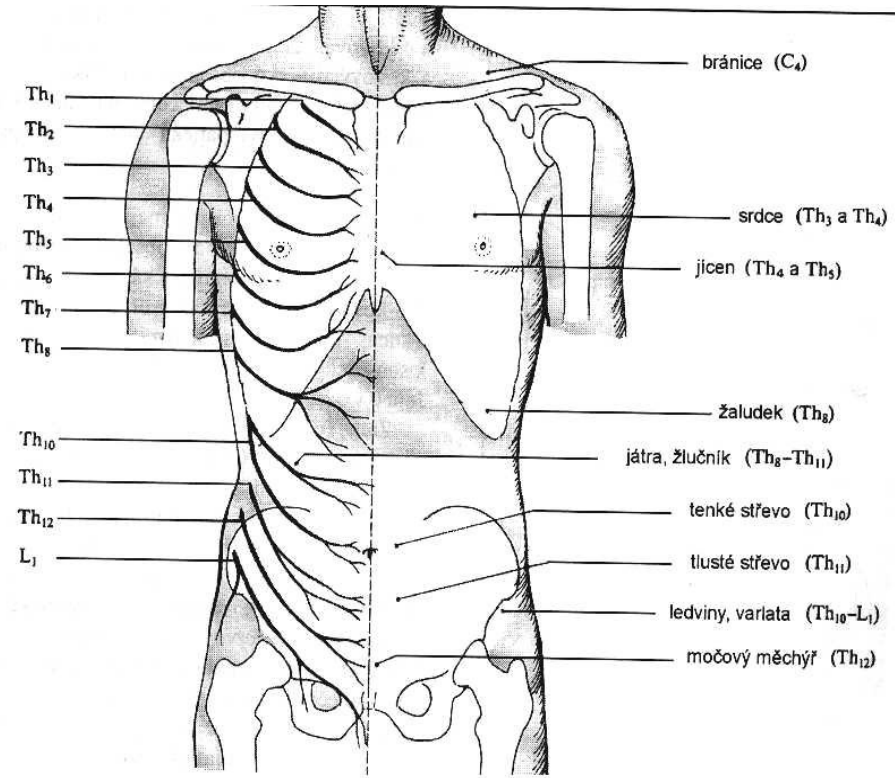
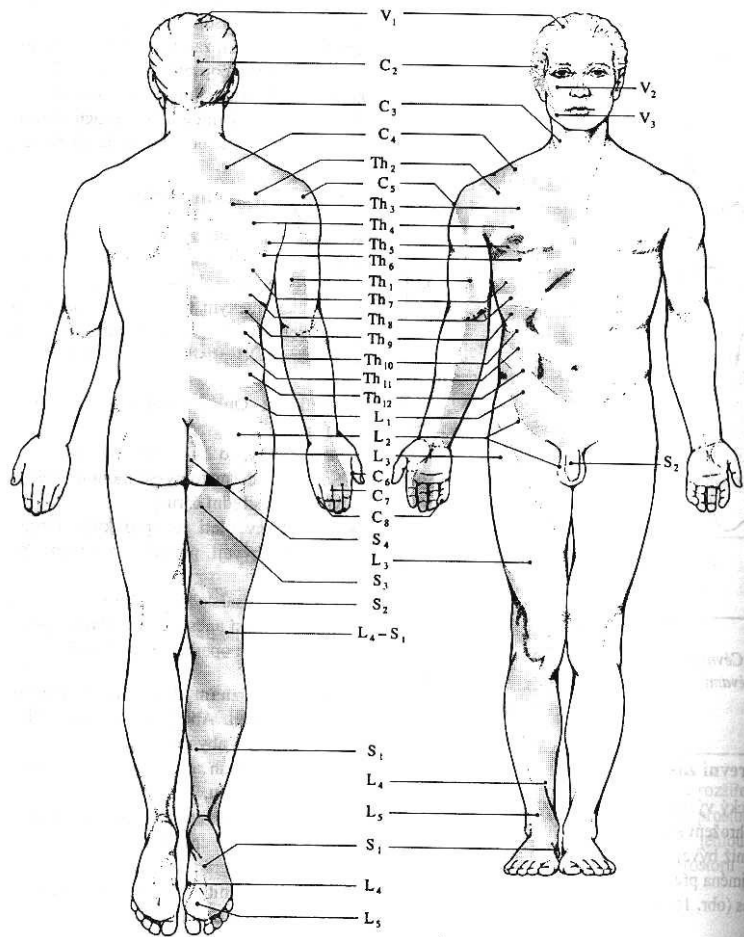


# Anatomy of spinal cord

- 7 C, 12 Th, 5 L, 5 S a 4-5 Co
- spinal cord L1/2
- spinal cord cover  
(pia mater, arachnoidea, dura mater)
- ligamnta (ligg. supra- , interspinalia, lig. flavum)
- epidural a subarachnoid space



# Skin dermatomas





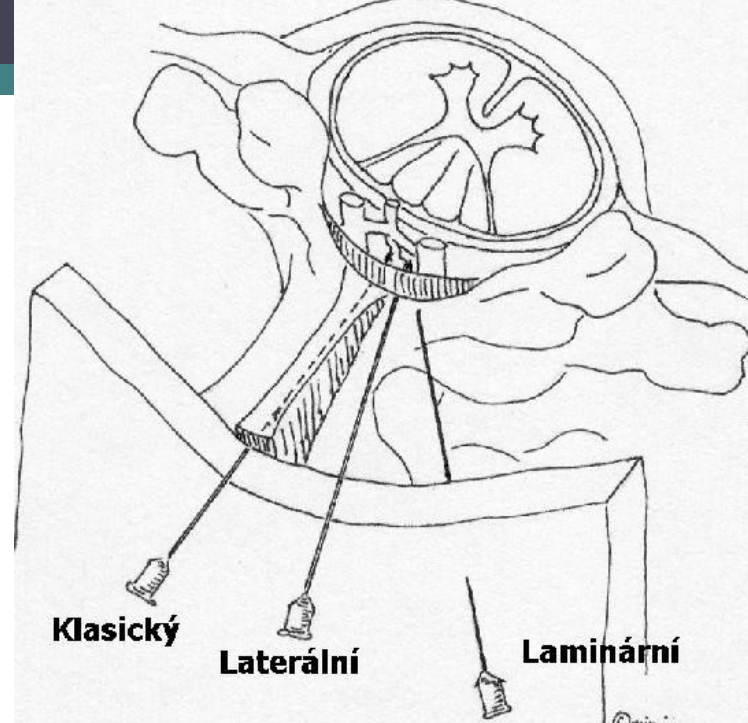
# Central neuroaxial block

- Indication:
  - Surgery bellow umbilicus
  - Combined anaesthesia for abdom. surgery
  - Continual technic for postoperative pain relief
  - Labour analgesia and anaesthesia
- Contraindication
  - Patient's refusal
  - Local infection
  - Hypotension, hypovolemia, shock
  - Valve stenosis - fixed cardiac output
  - Coagulopathies (warfarin, heparin)

# Systemic effect of central blockade

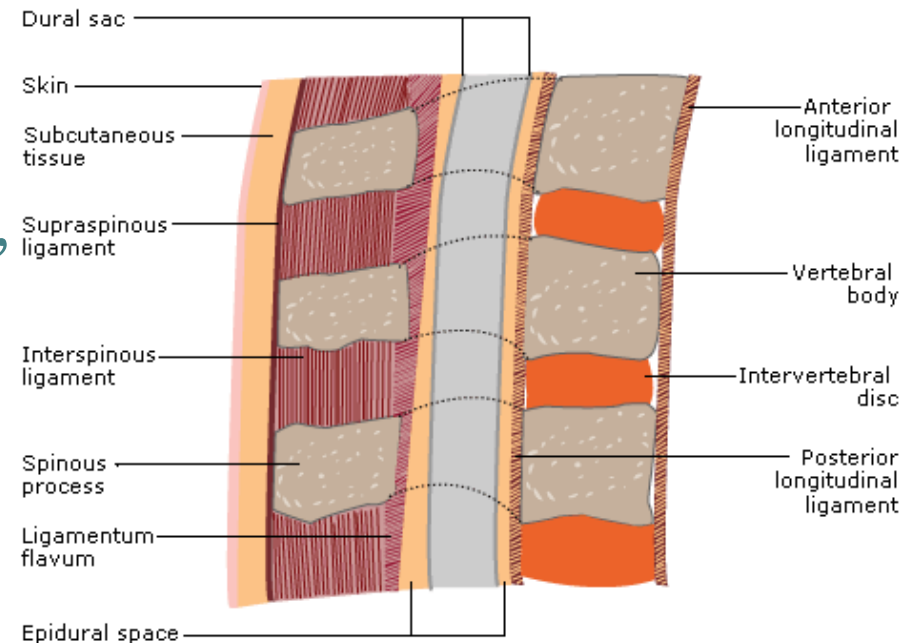
- Cardiovascular system
  - Sympathetic block
    - Hypotension
    - Reduced venous return
    - Relative hypovolemia
- Ventilation: small influence
- Urination: urinary retention





# Epidural anaesthesia

- Epidural space
  - posterior border: lig. flavum vertebral arches
  - Content: fat connective tissue, lymphatic vessels, vessels for vertebra and spinal cord, **radices of spinal nerves, spinal cord, spinal covers**
  - thickness of epidural space >
    - lumbar: 5 - 6 mm
    - thoracic: 3 - 5 mm
    - cervical: about 3 mm



# Epidural anaesthesia

- Spread of anaesthetics:
  - Both direction from the end of needle or catheter
- Dose: 2 ml per segment
- Density of block depends on the concentration of LA used



# Equipment



# Lumbar epidural block



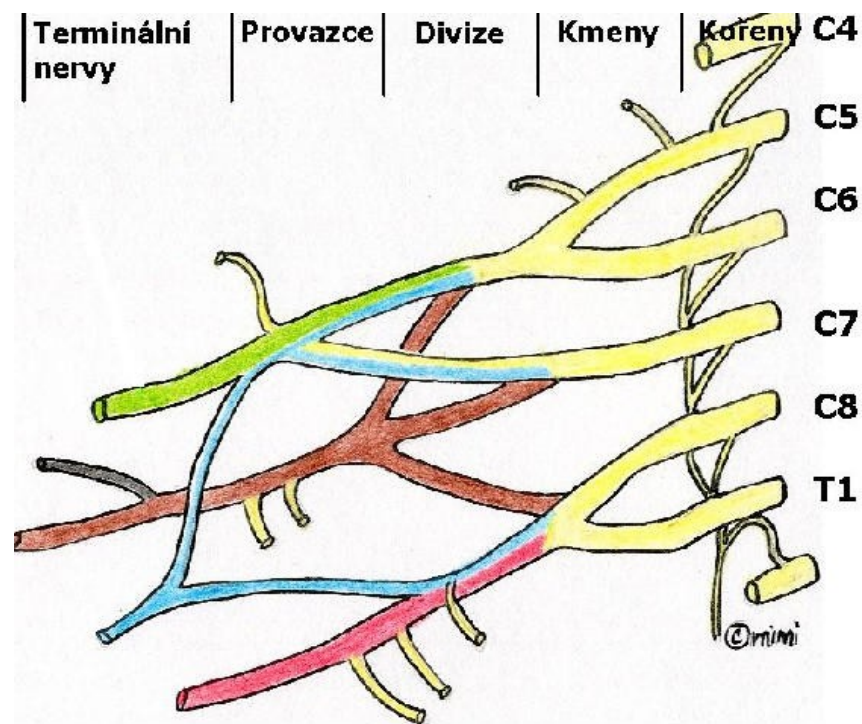
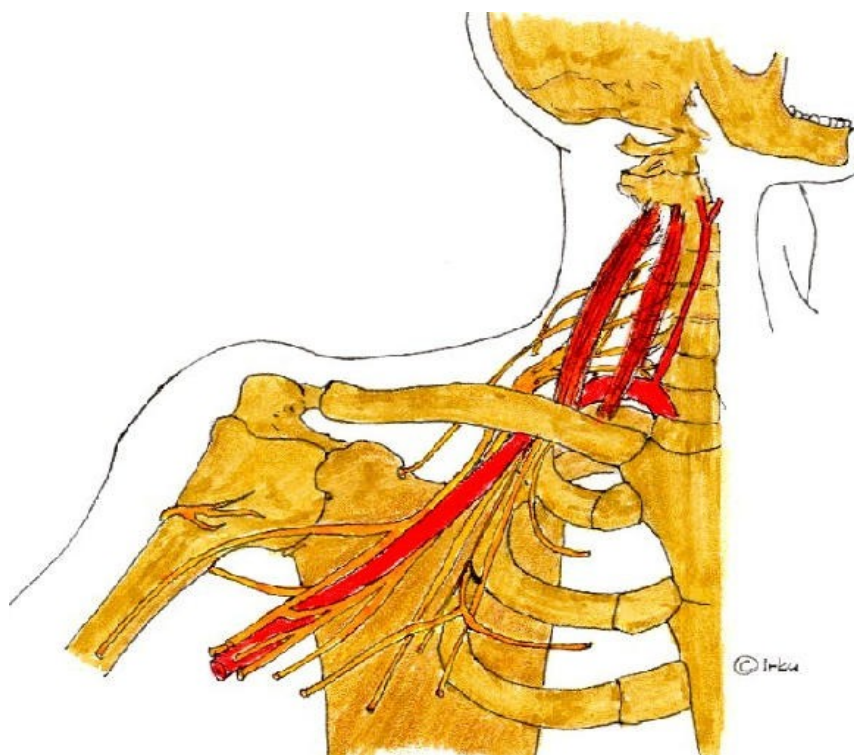
# Cervical epidural



# Peripheral blocks

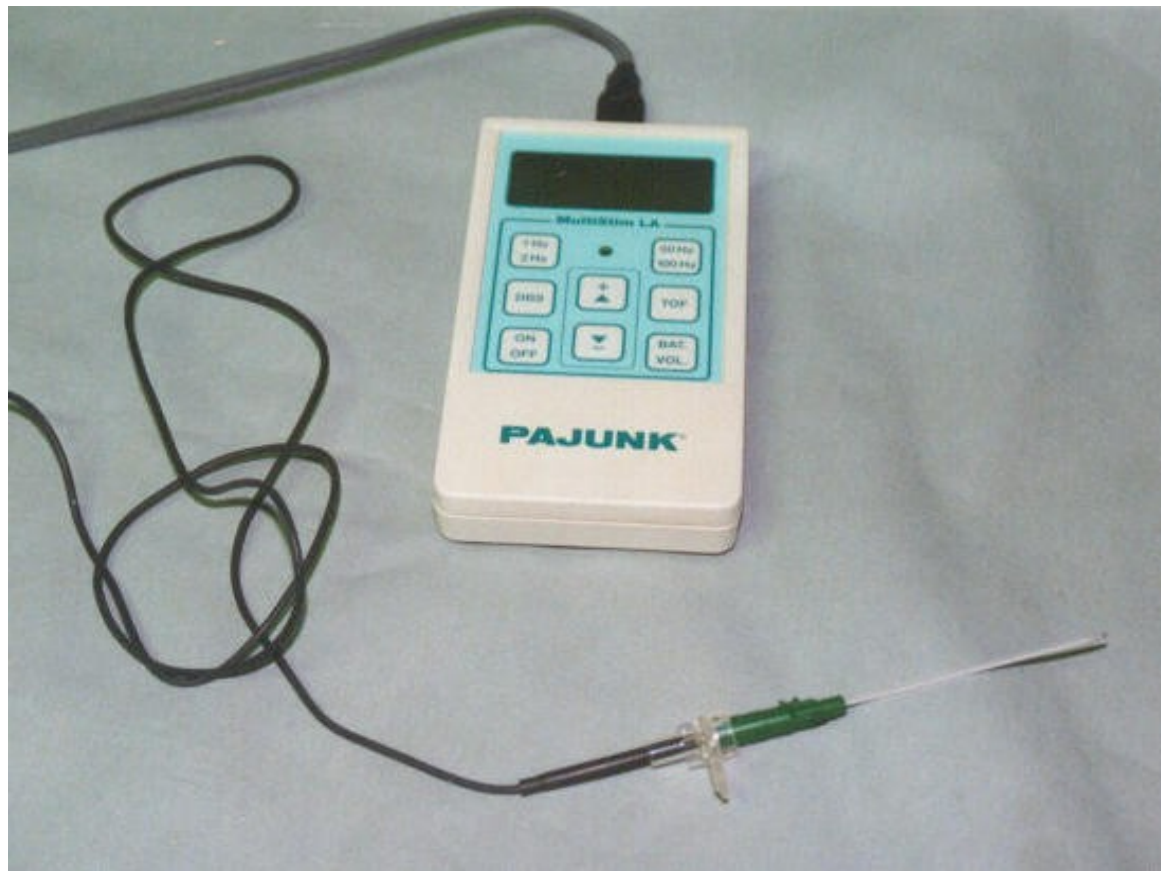
- Single nerves
- Nerve plexuses

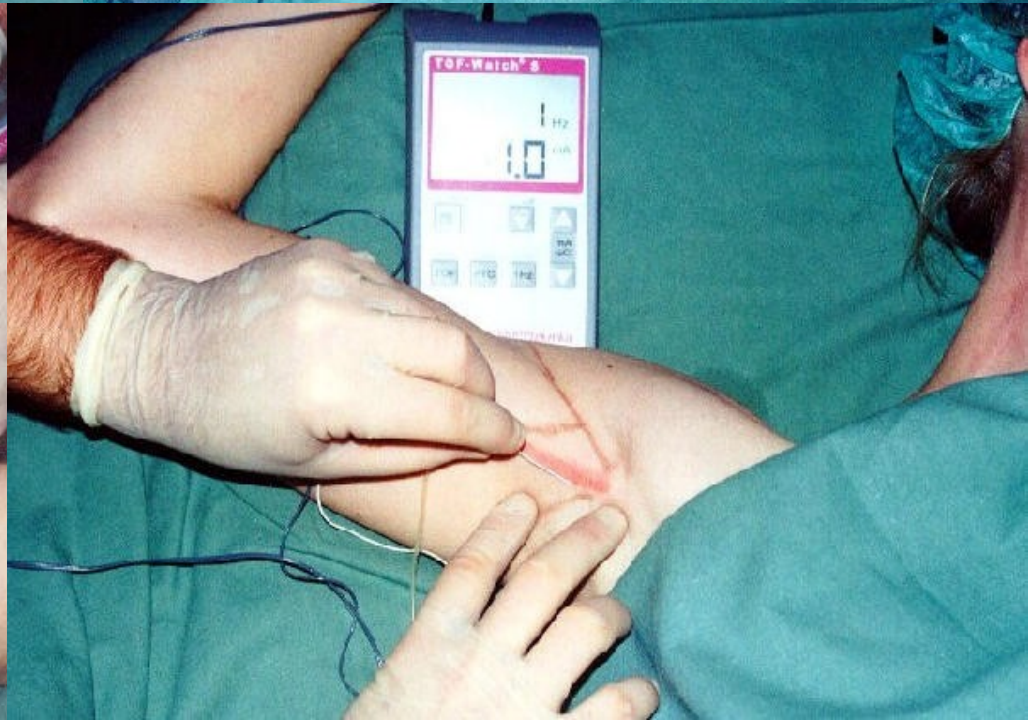
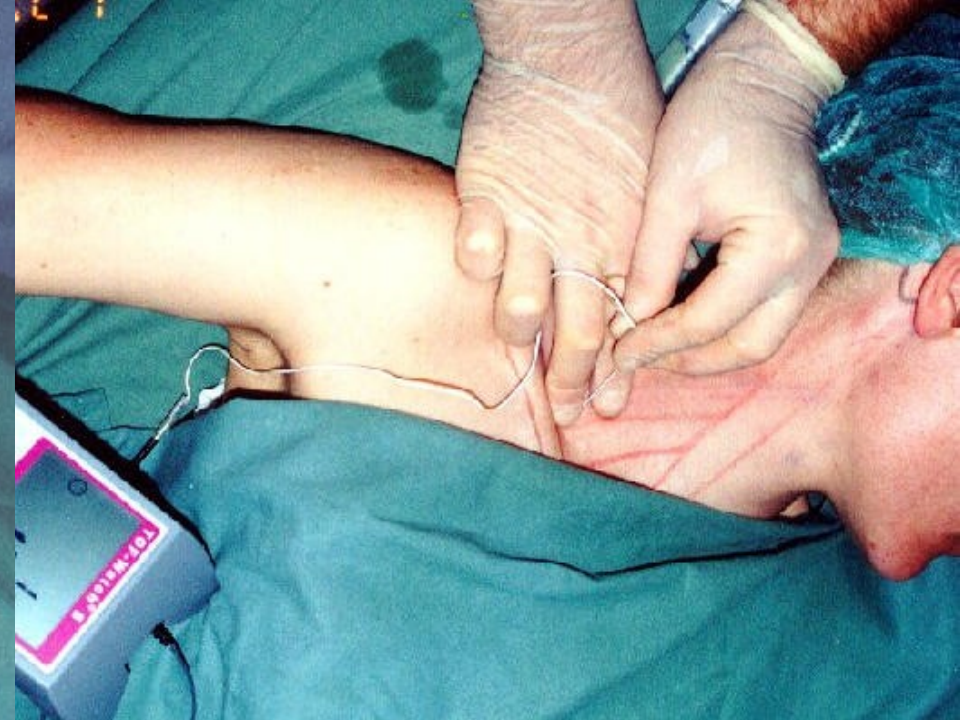
# Plexus brachialis





# Stimulator





Questions ?