

A photograph of an operating room with several surgeons in blue scrubs and masks performing a procedure. The scene is brightly lit with overhead surgical lights. In the foreground, a woman in a white hairnet and dark scrubs is looking towards the surgical team. To the right, there are medical monitors and IV stands with bags. The overall atmosphere is professional and clinical.

GENERAL AND REGIONAL ANAESTHESIA

Katarina Zadrazilova

FN Brno, 2014

..aims

- What do anaesthetists do
- Basic anaesthetic management
- Drugs, gases, monitoring, machines



The role of anaesthetist

- Ensures safe anaesthesia for surgery
- Is responsible for patient safety in theatre
- Ensures the anaesthetic machine and drugs are checked and correct
- Liase with the surgeon and scrub team – ensure that the operation can proceed smoothly
- Keep an anaesthetic record
- Makes a postoperative plan

Anaesthetic plan

- Preoperative
- Intraoperative
- And postoperative management

Anaesthetic plan

- **Preoperative**
- Intraoperative
- And postoperative management

Preoperative management

- Anaesthetic assessment :history and examination
- Relevant investigations : lab, CXR, ECG
- Optimise chronic condition
- Plan for intra and post op pain relief
- Discuss ev. HDU/ICU post op bed for patient
- Consent the patient
- Prescribe premedication

Anaesthetic assessment

- Previous surgery (GA, LA, complications)
- Medical hx, Medication, FH
- Allergies
- Last meal, drink !
- Teeth
- Pregnancy
- Examination: airway assessment, neck, back + general physical exam.

Risk assessment - ASA grade

- I Healthy patient
- II Mild systemic disease, no functional limitations
- III Severe systemic disease- definite functional limitation
- IV Severe systemic disease that is a constant threat to life
- V Moribund patient not expected to survive 24 hours with or without operation

Premedication

- Sedation/**anxiolysis** (Benzodiazepines)
- Analgesia only if pain (opioids)
- Reduce airway secretions + heart rate control + hemodynamic stability
- Prevent bronchospasm
- Prevent and/or minimize the impact of **aspiration**
- Decrease post-op nausea/vomiting

Consent

- Discuss all options GA/regional
- Risks versus benefits
- Complications – common, rare and serious
- Make pain relief plan



Complications

NO RISK = NO ANAESTHESIA

- Common (someone in a street)
 - PONV, sore throat, backache, headache, dizziness
- Rare and serious (someone in a big town)
 - Damage to the eyes, anaphylactic shock, death, equipment failure

Mortality of anaesthesia (ASA I)

- Risk of death or brain damage
 - 1 : 100 000 – 200 000
- Dying in a plane crash
 - 1 : 200 000
- Dying in a car crash
 - 1 : 5000



Anaesthetic plan

- Preoperative
- **Intraoperative**
- And postoperative management

Teamwork !



Operating theatre

- Allow surgery, ECT
- Allow diagnostic method (CT, MRI)



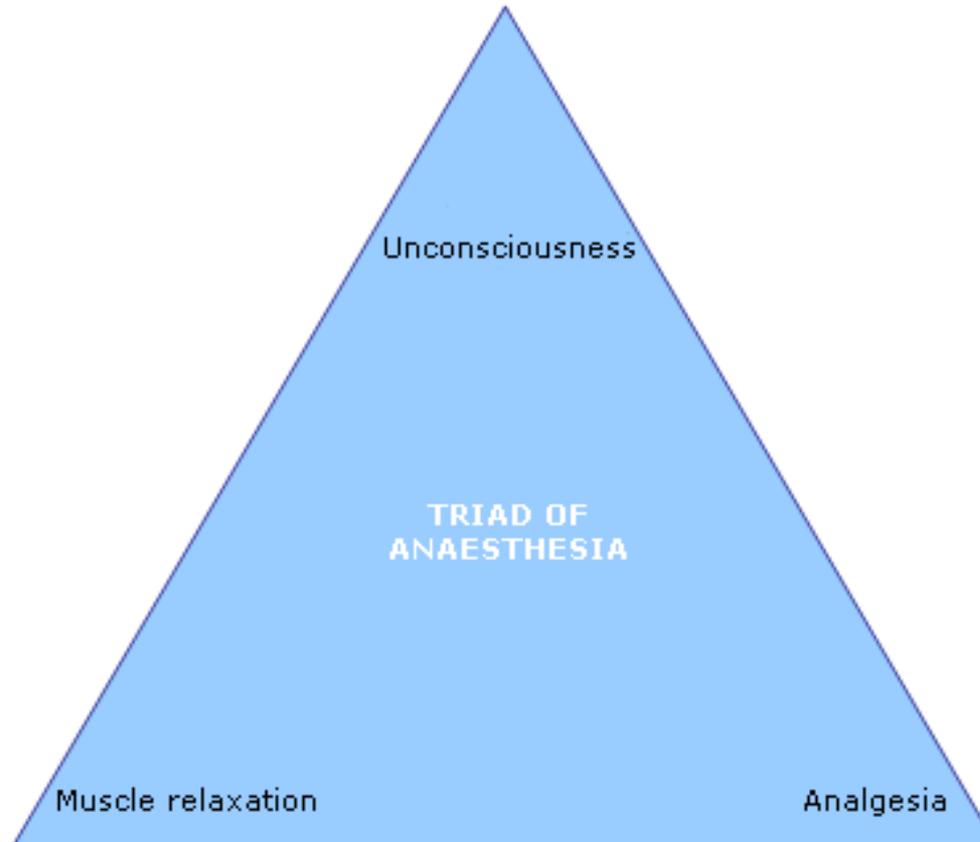
Anaesthesia = loss of sensation

- General (narcosis)
- Local / regional
- Combined

Anaesthesia = loss of sensation

- **General (narcosis)**
- Local / regional
- Combined

AIMS OF ANAESTHESIA



Triad of anaesthesia

- **Neuromuscular blocking agents** for muscle relaxation
- **Analgesics**/regional anaesthesia for analgesia
- **Anaesthetic agents** to produce unconsciousness

Stages of anaesthetics

- **Induction** – putting asleep
- **Maintenance** – keeping the patient asleep
- **Reversal** – waking up the patient



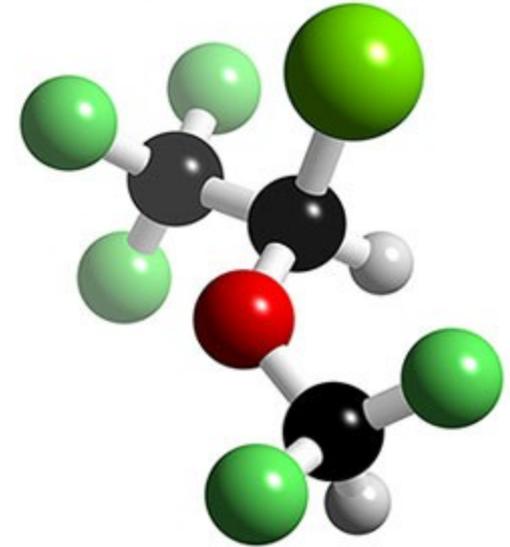
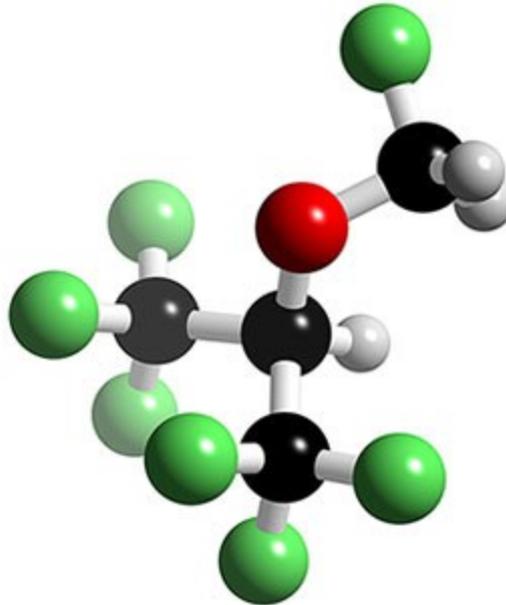
Intravenous anaesthetics

- Onset of anaesthesia within one arm – brain circulation time – 30 sec
- Effect site → brain
 - Propofol
 - Thiopentale
 - Etomidate



Anaesthetic gases

- Isoflurane
- Sevoflurane
- Halothane
- Enflurane
- Desflurane
- N_2O – nitrous oxide



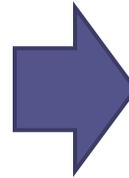
Anaesthetic gases

- Used for maintenance, sometimes induction
- Anaesthetic 'gases' are administered via **vaporizers**



Intravenous anaesthetics

Induction + maintenance



Muscle relaxants - NMBs

- Tracheal intubation
- Surgery where muscle relaxation is essential
- Mechanical ventilation

- Place of effect - neuromuscular junction
- History - South American Indians (kurare)



Analgesics

- Simple : paracetamol, NSAID
- Opioids : morphine, fentanyl
 - Via opioid receptors



MORPHEUS- GREEK GOD OF DREAMS

Monitoring

- Basic:
 - NIBP, ECG, Sat, ETCO₂, FiO₂
- Extended:
 - Nerve stimulator, temperature, diuresis, IBP, CO, CVP, perioperative acid-base, lab

Anaesthetic machine

- Mix gases, ventilate, preserve heat and moisture

High pressure

central gas supply/ cylinder

Low pressure system

- Flowmeters
- Vaporisers
- Breathing circuit:
 - bag + tubes
 - valves (uni directional)
 - CO₂ absorber
- Ventilator



Airway management

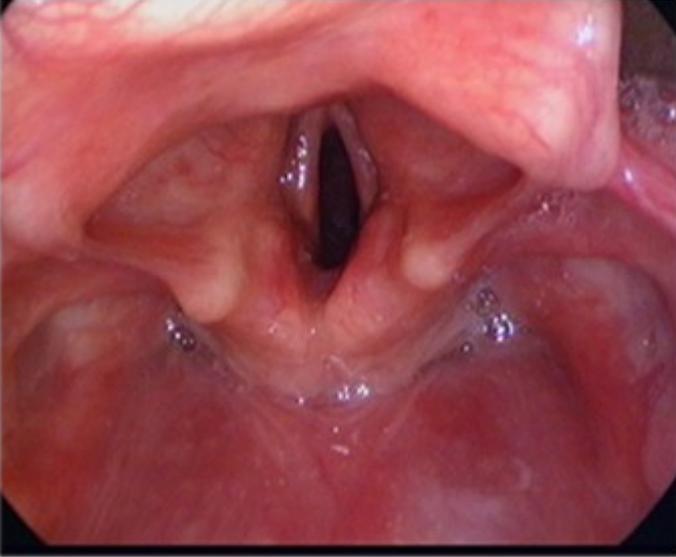
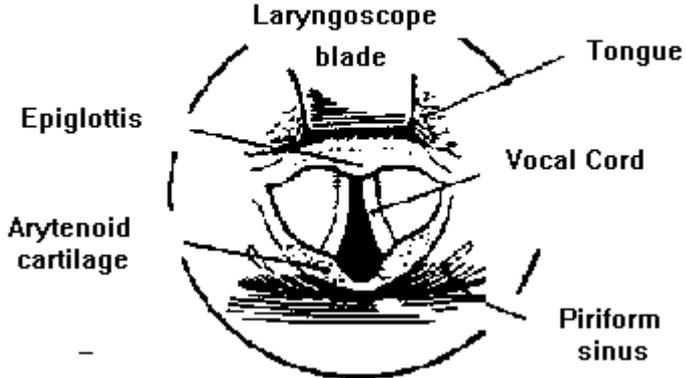
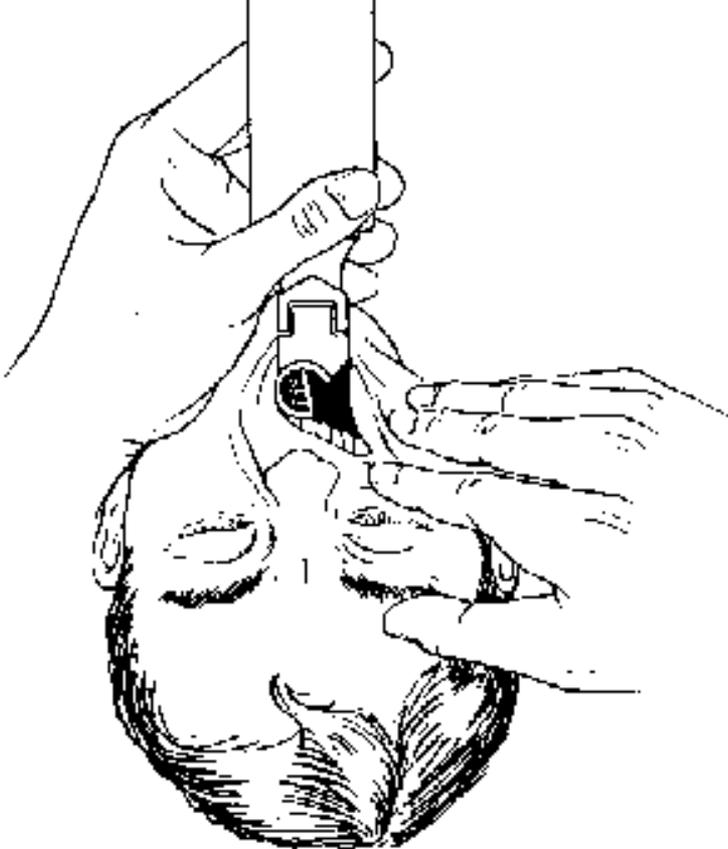
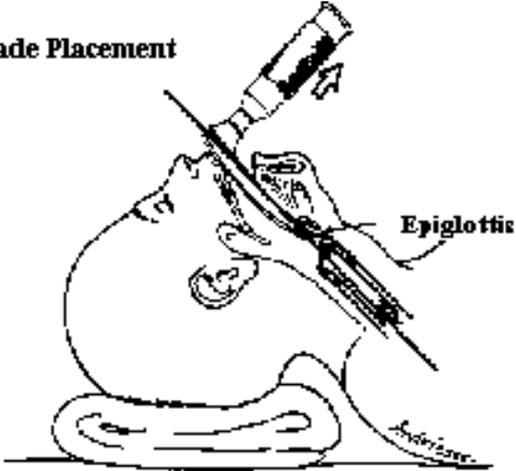
Indication for intubation:

- Need of relaxation or PPV
- Full stomach
- Orotracheal intubation, nasotracheal intubation with direct laryngoscopy
- Tracheotomy
- Laryngeal mask
- Cricothyrotomy



Intubation

Straight Blade Placement



Laryngeal Mask

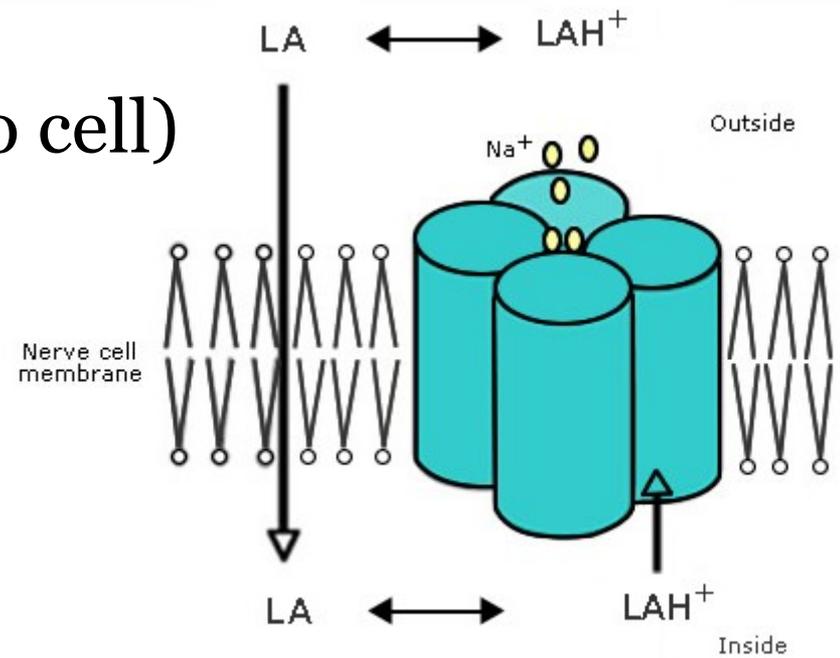


Anaesthesia = loss of sensation

- General (narcosis)
- **Local / regional**
- Combined

Local anaesthetic

- Reversible block
- Sodium ion canal (Na^+ to cell)



Nerve fibre

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



What does the block of nerves lead to?

- Somatic sensory - loss of cutaneous sensation (numbness), proprioception
- Motor nerve - loss of movement
 - (if it is a motor nerve) in the distribution of the peripheral nerve
- Autonomic nerves - vasodilation and warmth

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)



Use of RA

- Analgesia, e.g. fractured femur, fractured ribs
- As the sole anaesthetic for surgery with or without sedation, e.g. hand surgery
- In combination with GA, e.g. total knee replacement
- For postoperative analgesia

When to use regional techniques

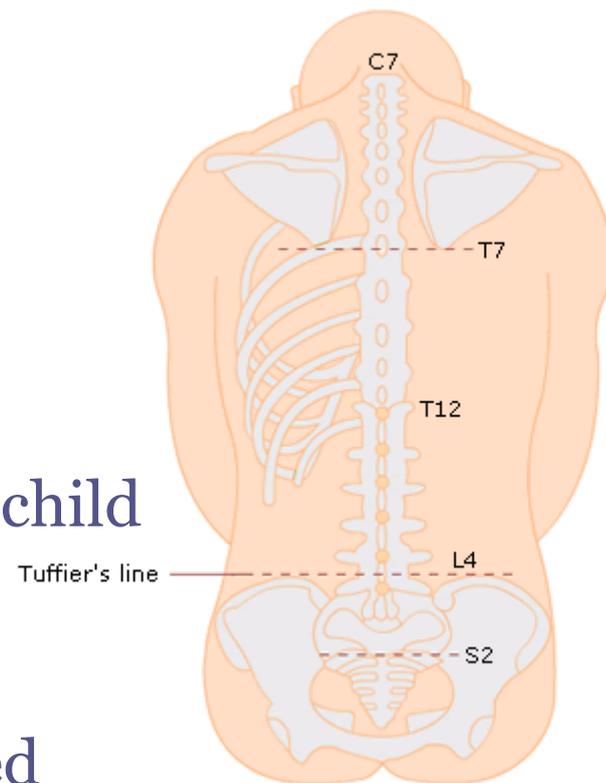
1. **Patient safety** – frail elderly, comorbidities
2. **Patient satisfaction** – ealy oral intake, no PONV, no sore throat
3. **Surgical outcome** - awake craniotomy

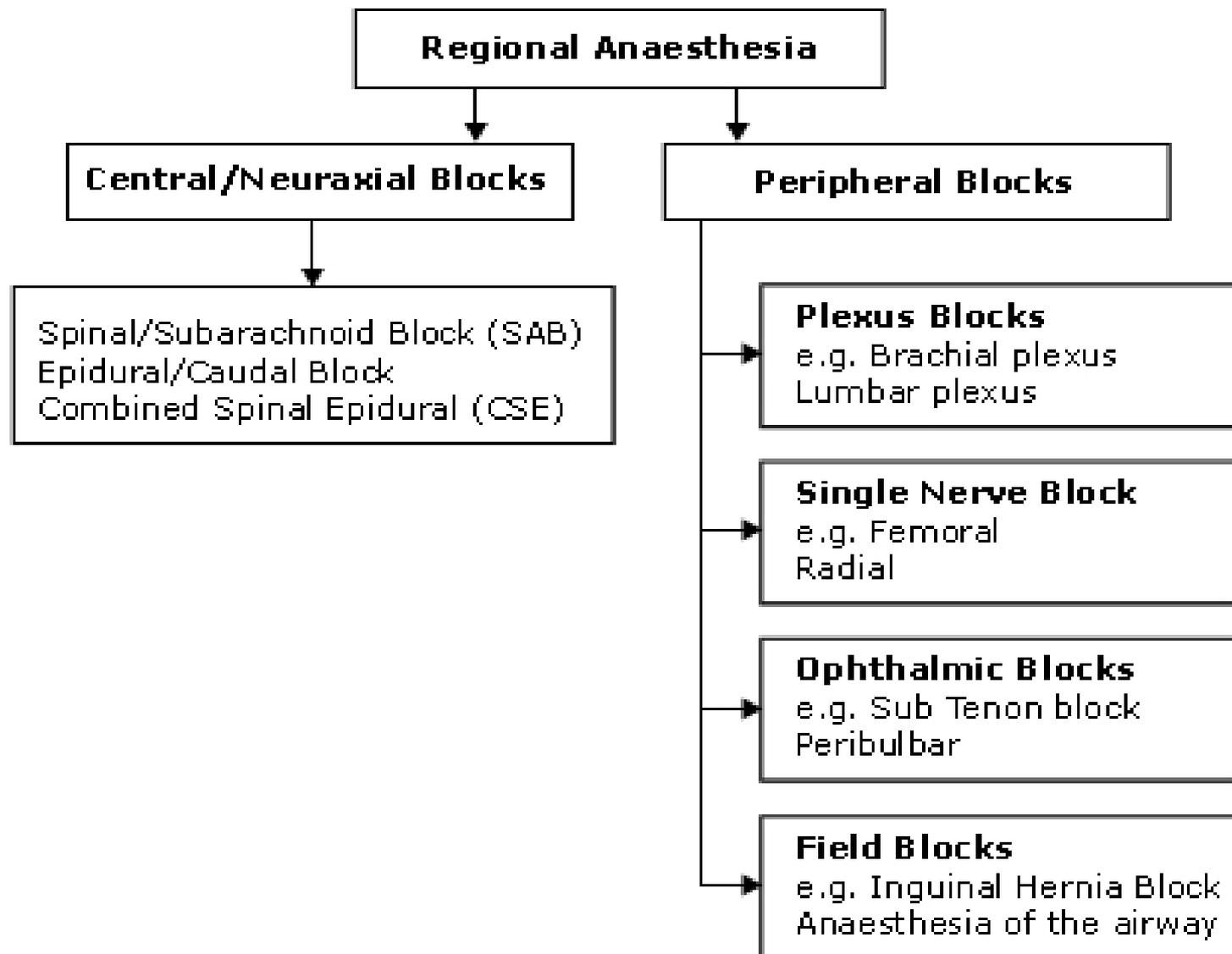


Most common regional anaesthesia

Caesarian section

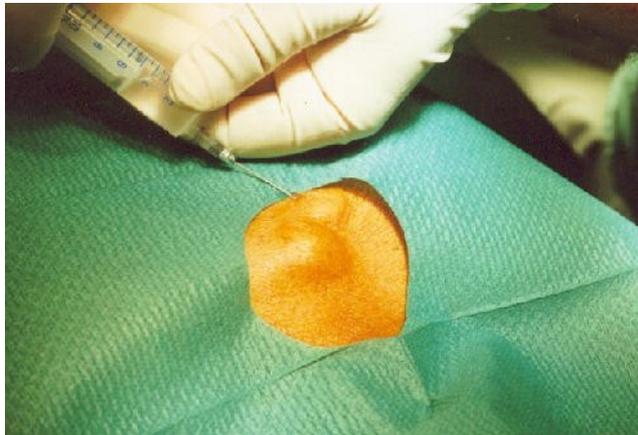
- Patient safety
 - Control of airway
- Patient satisfaction
 - Awake during the delivery of the child
 - Presence of partner
- Surgical outcome
 - Intraoperative bleeding is reduced
 - Reduced stress response



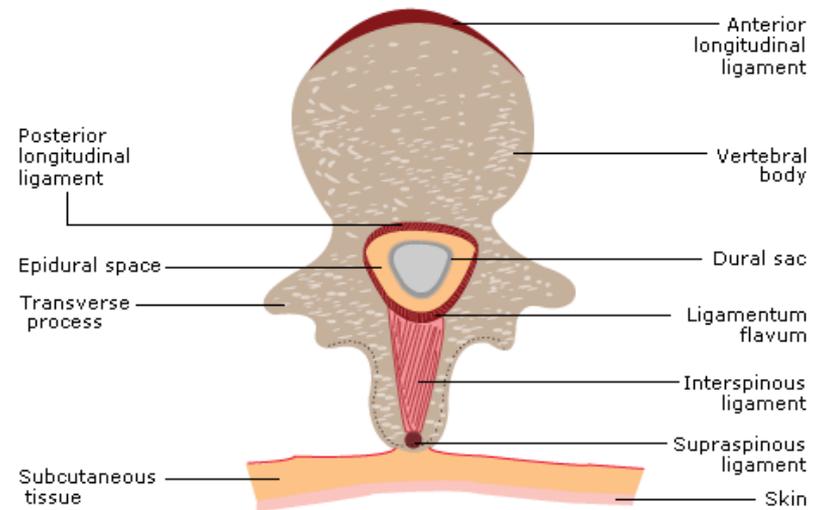
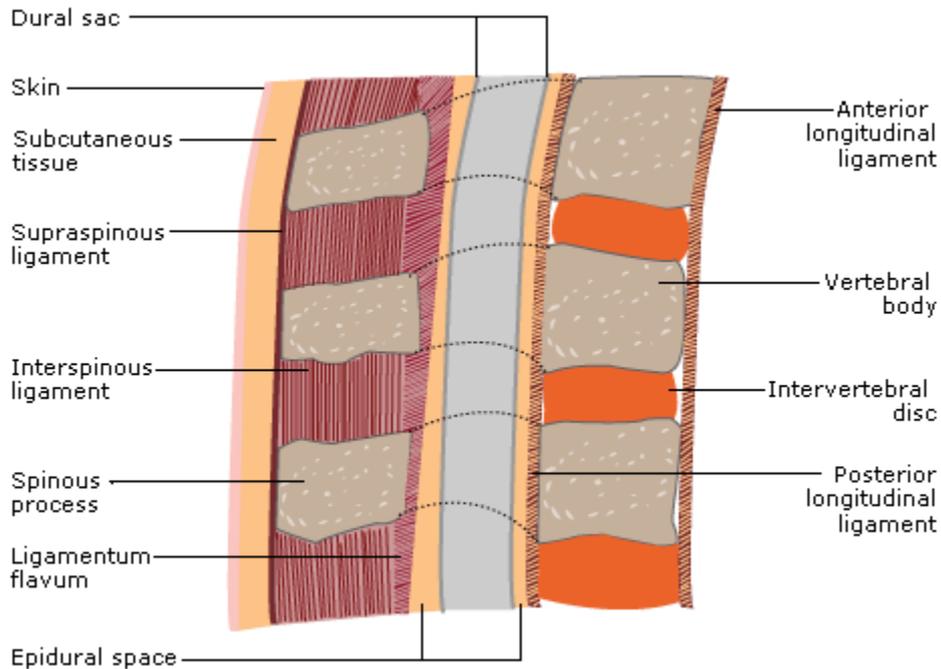


Local anaesthesia

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



Neuroaxial blocks

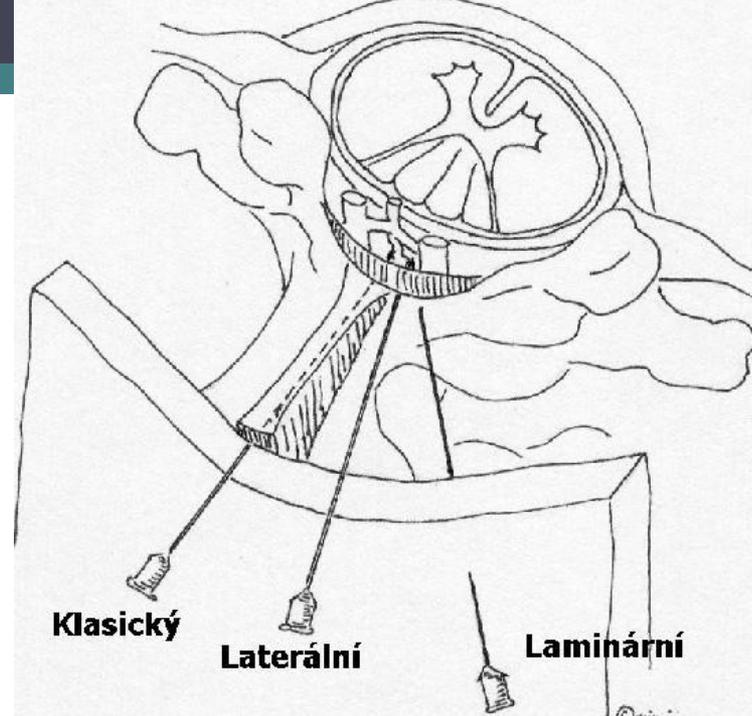


Central neuroaxial block

- 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



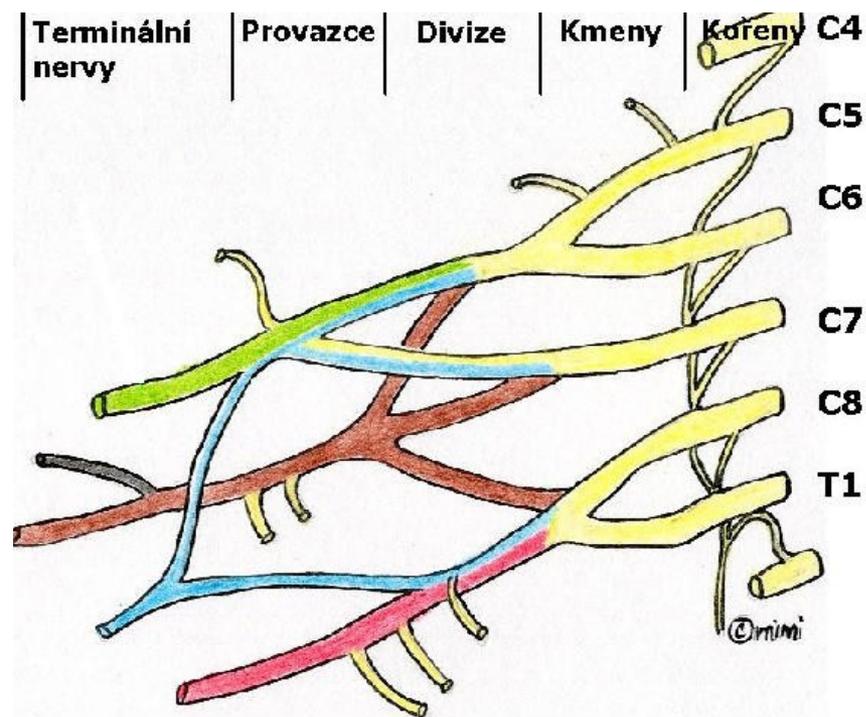
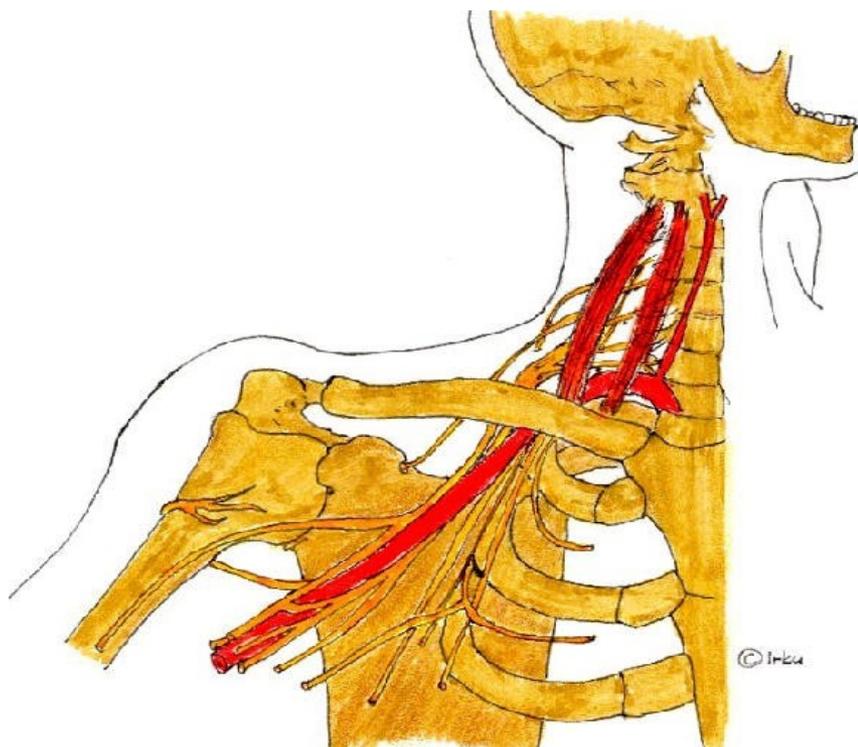
Lumbar epidural block



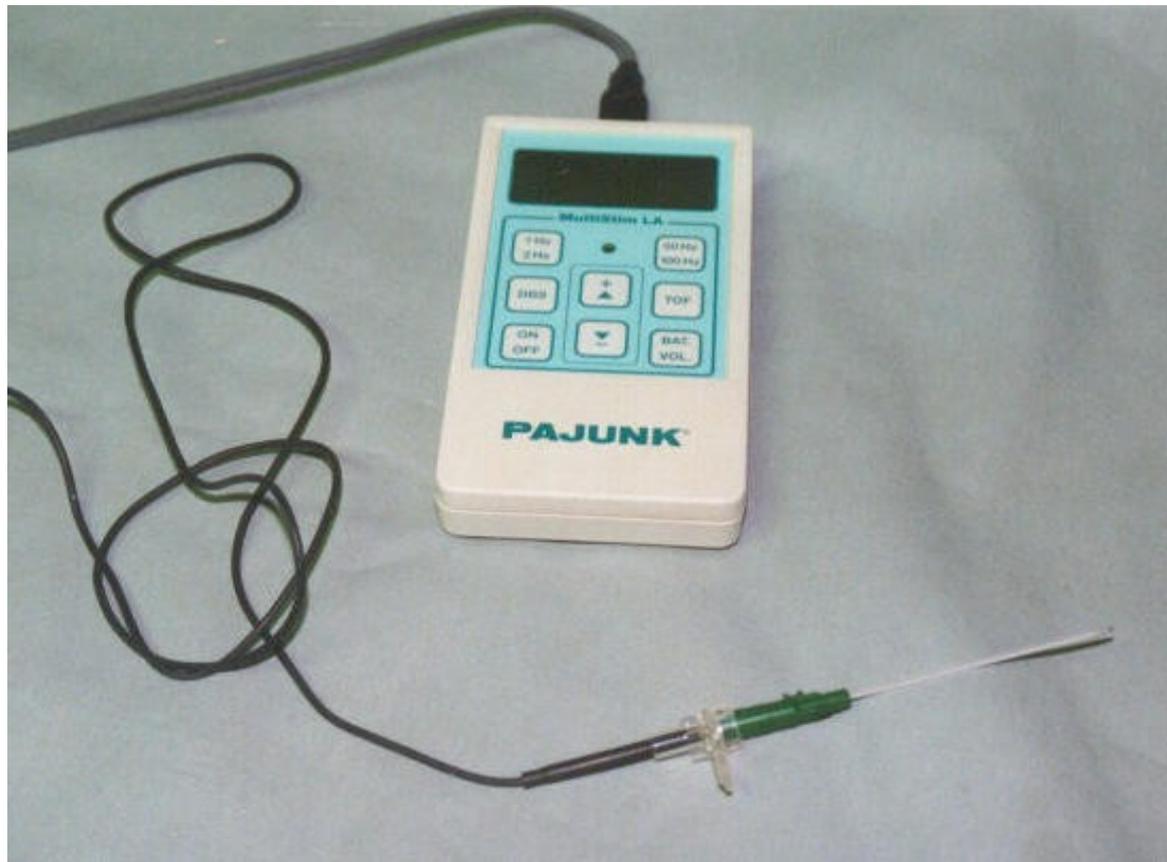
Peripheral blocks

- Single nerves
- Nerve plexuses

Plexus brachialis



Stimulator



Anaesthetic plan

- Preoperative
- Intraoperative
- And **postoperative management**

Postoperative care

- ICU/HDU or ward
- Monitoring according to type of surgery and patient's condition
- Post-operative pain control
- Lab check up
- Infusion therapy, blood loss monitoring

Questions ?

