ANESTHESIA DURING LABOR

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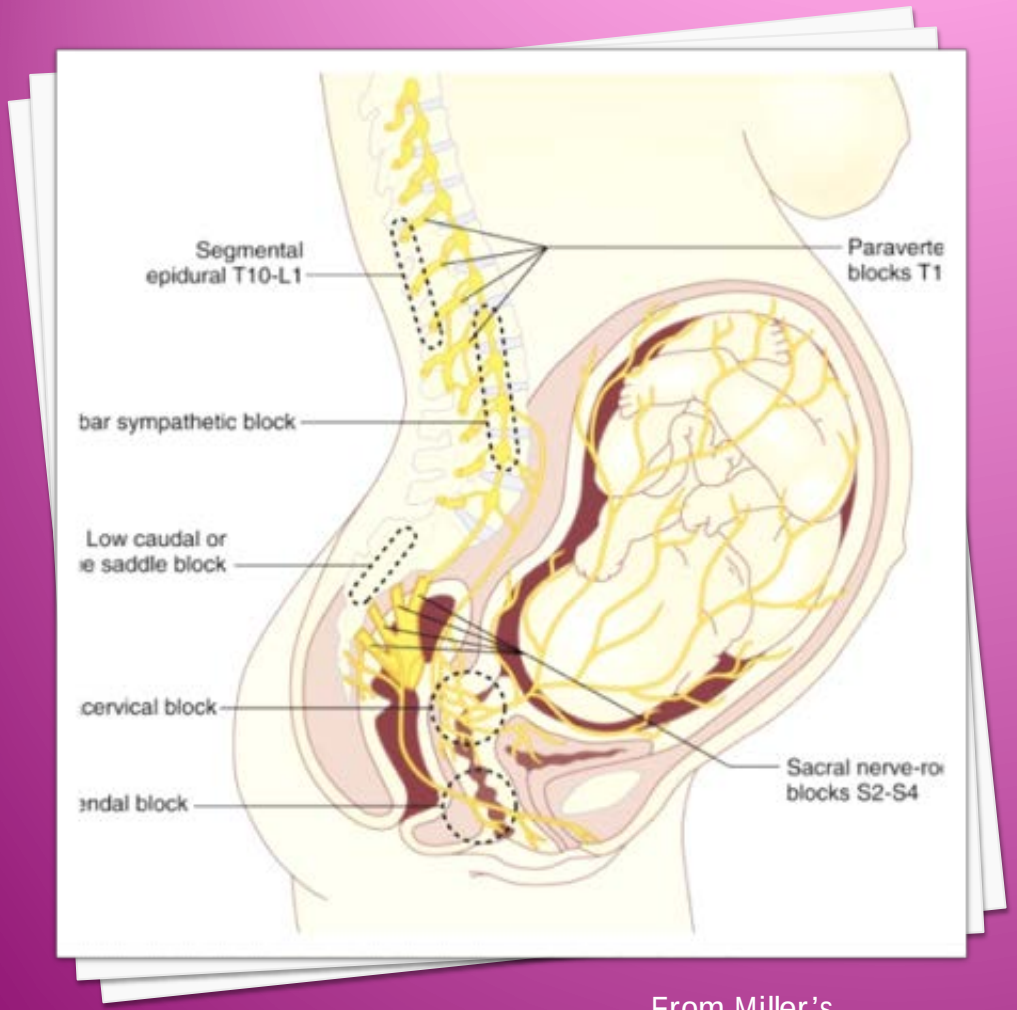
QUICK REVIEW: MATERNAL PHYSIOLOGY

- Cardiovascular:
  - ↑ CO
  - ↑ Intravascular Fluid
  - ↓ SVR
  - Aortocaval compression
- Pulmonary:
  - Upper airway edema
  - ↑ minute ventilation
  - ↓ FRC
  - ↑ increased O2 uptake
- Nervous System:
  - ↓ MAC
  - Epidural vein dilation → ↓ CSF in subarachnoid space

MATERNAL PHYSIOLOGY CONT'D

- Renal:
  - ↑Renal blood flow and GFR
- Hepatic:
  - Dilutional decrease of plasma proteins
  - Decreased plasma cholinesterase (minimal effects on NMBD prolongation)
  - Increased coagulation factors
- Gastrointestinal:
  - Displacement of pylorus, delaying gastric emptying
  - Relaxation of LES
- Placental physiology/exchange
  - Diffusion from maternal to fetal circulation
  - NMBDs are limited in transfer
  - Barbiturates, local anesthetics, opioids more easily transferred



From Miller's Anesthesia, 7th edition

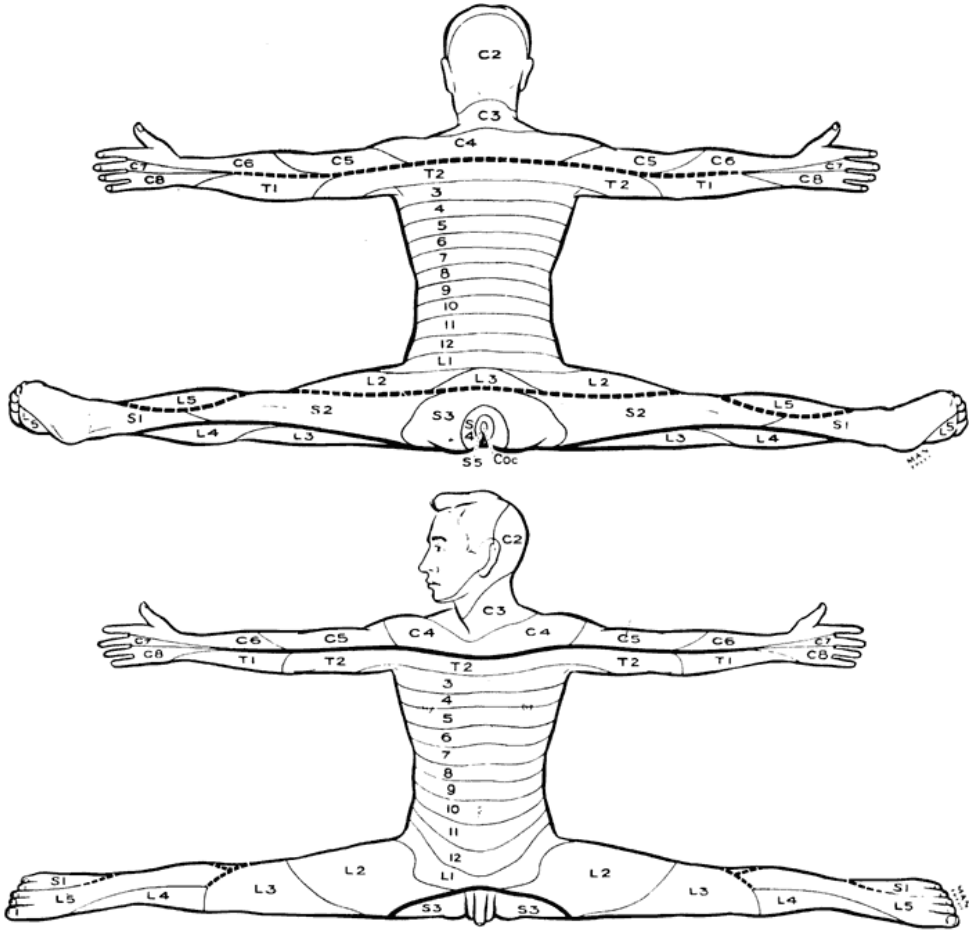
LABOR PAIN ANATOMY

Causes of pain:

- uterine contractions
- cervical dilation
- perineal distension

Somatic & visceral afferents from uterine and cervix travel through hypogastric plexus to sympathetic chains

SPINAL DERMATOMES



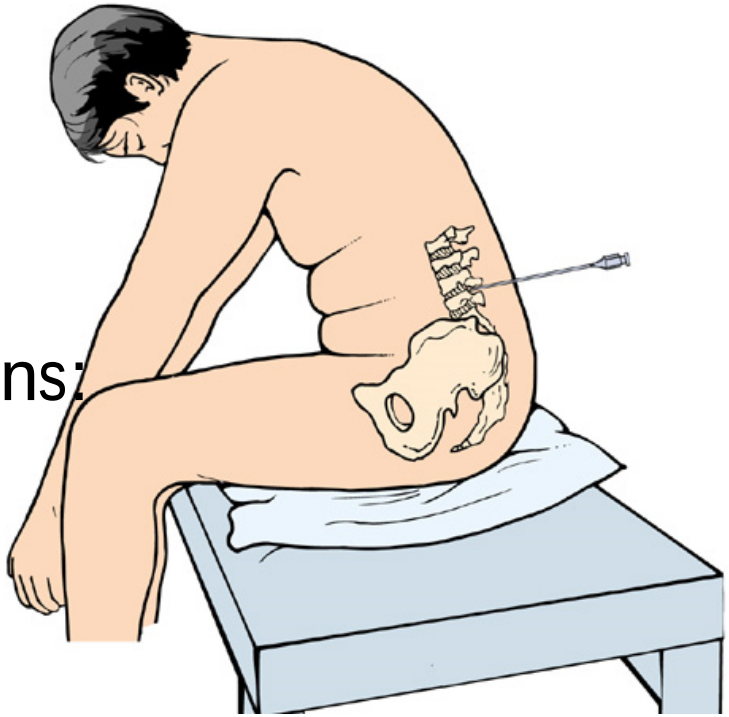
Source: Tintinalli JE, Kelen GD, Stapczynski JS: *Tintinalli's Emergency Medicine: A Comprehensive Study Guide*, 6th Edition: http://www.accessemergencymedicine.com

METHODS OF LABOR ANESTHESIA

- Systemic
- Inhalational
- REGIONAL:
  - Spinal
  - Epidural
  - Combined Spinal-Epidural (CSE)
  - Paracervical Block
  - Lumbar Sympathetic Block
  - Pudendal Block

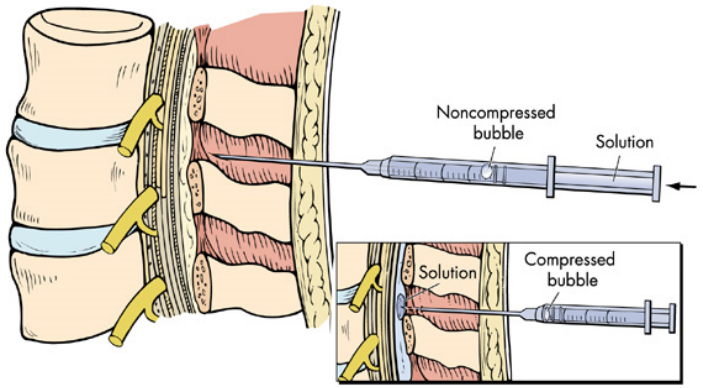
NEURAXIAL ANESTHESIA

- Relative Contraindications:
  - Bacteremia
  - Neurologic disease (MS)
  - Cardiac disease
- Absolute Contraindications:
  - Infection at site
  - Coagulopathy
  - Increased ICP
  - Patient refusal
  - Sepsis



From Images, MD. Principles of Anesthetic Techniques and Anesthetic Emergencies

EPIDURAL ANESTHSIA

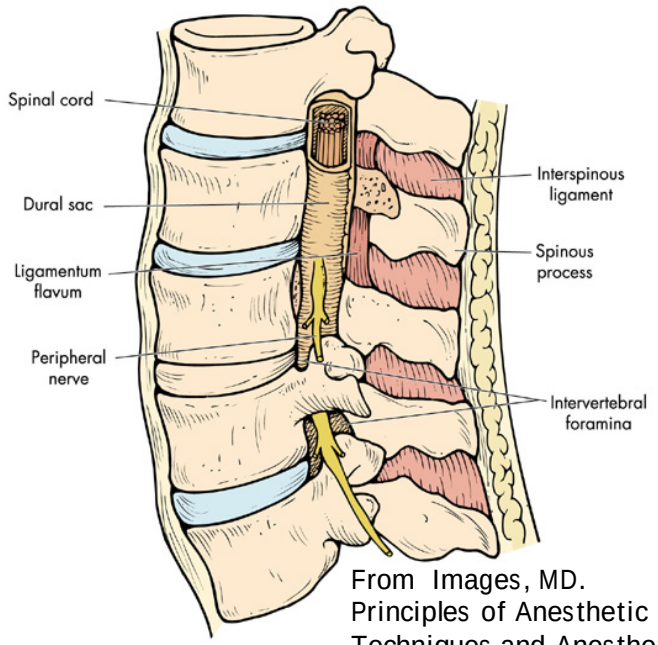


Loss of Resistance Technique

From Images, MD. Principles of Anesthetic Techniques and Anesthetic Emergencies

- Injecting anesthetic into vertebral canal superficial to the dural sac
- Produces segmental sensory block
- Reduces catecholamines
- Segmental Anesthesia: T10-L1
- Can be used for post-op pain
- Patient-controlled epidural analgesia
- Technique:
  - Correct patient positioning to open up interspinous space
  - Palpate Spinous processes, Insert Needle
  - Loss of Resistance
  - Insert catheter, remove needle
  - Test dose
  - Secure catheter

SPINAL ANESTHESIA



From Images, MD. Principles of Anesthetic Techniques and Anesthetic Emergencies

- Injecting anesthetic into CSF into subarachnoid space
- Confirm placement with appearance of CSF
- Rapid onset of sympathetctomy
- Can be used in advanced stages of labor
- Most common regional anesthetic for C/S in women without epidural catheter
- Sensory analgesia without profound skeletal muscle weakness
- Higher incidence of systemic hypotension
- Technique:
  - Uses 25-26 g pencil-point spinal needle
  - Uses dilute solution of lidocaine, bupivacaine, ropivacaine

LOCAL ANESTHETICS USED IN LABOR

- Bupivicaine: 0.125%-0.25%
  - Pain relief: 10 min
  - Peak effect: 20 min
  - Duration: 2 hours
- Lidocaine: 0.75%-1.5%
  - Pain relief: 10 min
  - Duration: 45-90 min
- Chloroprocaine: 3%
  - Pain relief: rapid onset
  - Duration: 40 min

COMBINED SPINAL-EPIDURAL

- Find epidural space use Loss-of-resistance technique
- Use spinal needle to advance until CSF is seen
- Inject spinal local anesthetic and narcotic
- More reliable and faster onset with spinal needle
- Permits ambulation with opioid alone
- Epidural allows continuation of segmental anesthesia

COMPLICATIONS OF REGIONAL ANESTHESIA

- Hypotension
  - Most common complication (occurs in 1/3 spinal pts)
  - Tx: uterine displacement, IVF, vasopressor
- Systemic toxicity
  - Maternal seizures
  - CV collapse
  - Prevent with aspiration, test dosing, incremental dosing
- Excessive Neural Blockade
  - Tx: ET intubation and ventilation
  - Decrease aortocaval compression, fluids, pressors
  - Epinephrine if above doesn't work
- Altered Labor Progression
  - Unpredictable until labor has become active
  - May prolong 2nd stage of labor
- Post-Dural Puncture Headache
  - 12-48 hrs later
    - Postural component (relieved when supine)
    - Tx: bed rest, fluids, caffeine, blood patch
- High Spinal
- Nausea
- Urinary retention
- Backache
- Hypoventilation
- Intravascular Injection
  - Epidural space is very vascular
  - Mild CNS symptoms (tinnitus, restlessness, slurred speech, seizures and CV collapse)
- Increased Body Temperature

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THANKS FOR YOUR TIME!