



CSE for labour analgesia

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Lecture outline

- CSE labour analgesia:
 - indications / technique
 - advantages / disadvantages
 - ambulation
 - recent developments

Techniques for labour analgesia

- Epidural catheter
- Single shot spinal
- Spinal microcatheter
- Combined spinal epidural (CSE)

Epidural

- Slow onset time (15 min)
- Loading dose
 - low dose mixture: bupivacaine / fentanyl
- Maintenance regimen
 - low dose mixture: bupivacaine / fentanyl
 - bolus, continuous infusion, PCEA, automatic

Combined spinal epidural



(spinal) Needle-through-Needle (epidural)

Indications for CSE

- Labour pain
 - early
 - late / 2nd stage ✓
 - PG induction / oxytocin
- Rapid delivery / difficult (OP position)
- Failed regional block

Low dose CSE (labour)

rapid analgesia



maternal distress

advanced labour

sacral analgesia

Typical CSE regimen

- Spinal
 - 2.5 mg bupivacaine + 5 - 15 µg fentanyl
 - 3 ml of epidural low dose mixture
- Epidural (**low dose mix = 0.1 % bupiv + 2 µg/ml fentanyl**)
 - intermittent bolus / continuous infusion
 - PCEA
 - automated intermittent bolus

CSE vs. epidural

Regional labour analgesia

CSE

Epidural

CSE vs. epidural

Regional labour analgesia

CSE

Epidural

- **Spinal starter**
 - 2.5 mg bupiv + 5-15 µg fentanyl
 - 2.5 mg bupiv + 2.5 µg sufentanil
 - 3ml low dose epidural mixture
- **Epidural topup**
 - 15ml low dose epidural mixture
 - 0.1% bupiv + 2µg/ml fentanyl
 - 0.0625% bupiv + 0.25µg/ml sufent
- **CI / PCEA / automatic bolus**

CSE vs. epidural

Regional labour analgesia

CSE

- **Spinal starter**
 - 2.5 mg bupiv + 25 µg fentanyl
 - 2.5 mg bupiv + 2.5 µg sufentanil
 - 3ml low dose epidural mixture
- **Epidural topup**
 - 15ml low dose epidural mixture
 - 0.1% bupiv + 2µg/ml fentanyl
 - 0.0625% bupiv + 0.25µg/ml sufent
- **CI / PCEA / automatic bolus**

Epidural

- **Epidural starter**
 - 15ml low dose epidural mixture
 - 0.1% bupiv + 2µg/ml fentanyl
 - 0.0625% bupiv + 0.25µg/ml sufent
- **Epidural topup**
 - 15ml low dose epidural mixture
- **CI / PCEA / automatic bolus**

Automatic epidural bolus

Yvonne Lim / Alex Sia – IJOA '05 – Automated epidural bolus vs continuous infusion



A new way of giving epidural labor analgesia

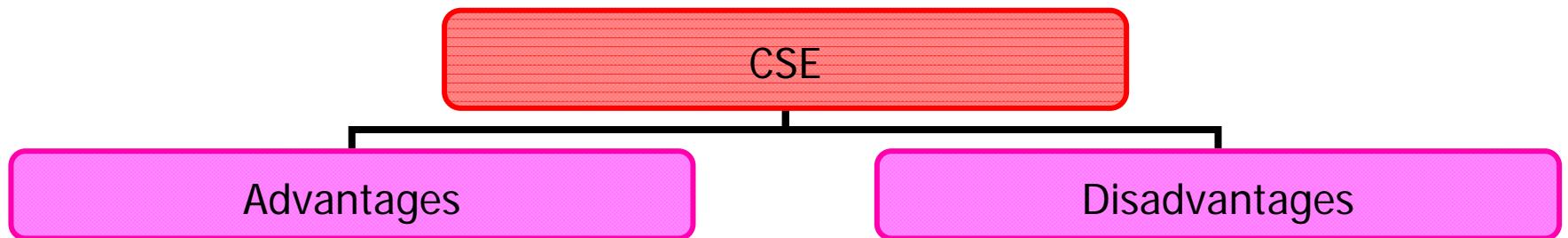
Not: nurse bolus on demand / continuous infusion / PCEA

Automatic epidural bolus at regular intervals

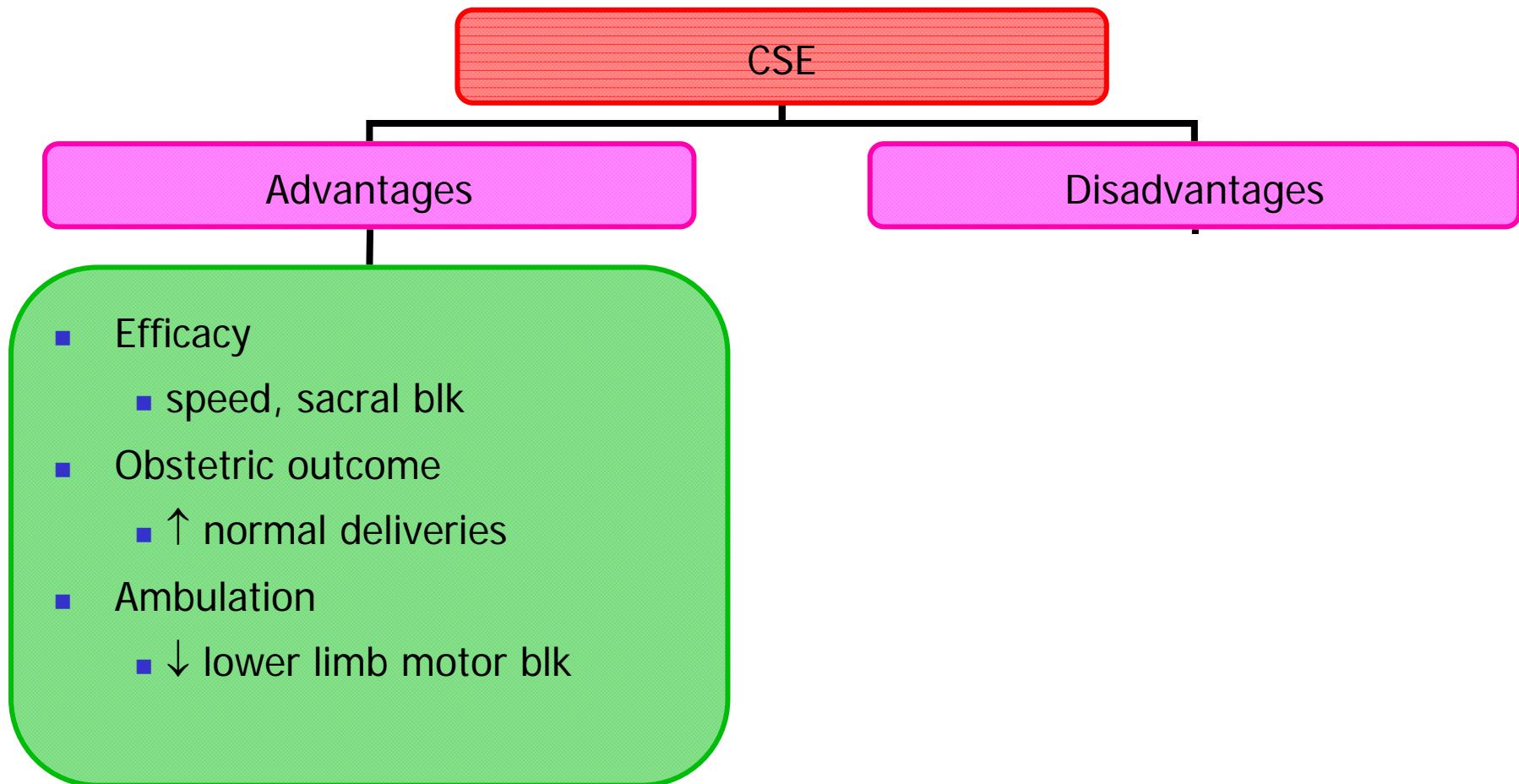
Lecture outline

- CSE labour analgesia:
 - indications / technique
 - advantages / disadvantages
 - ambulation / safety
 - recent developments

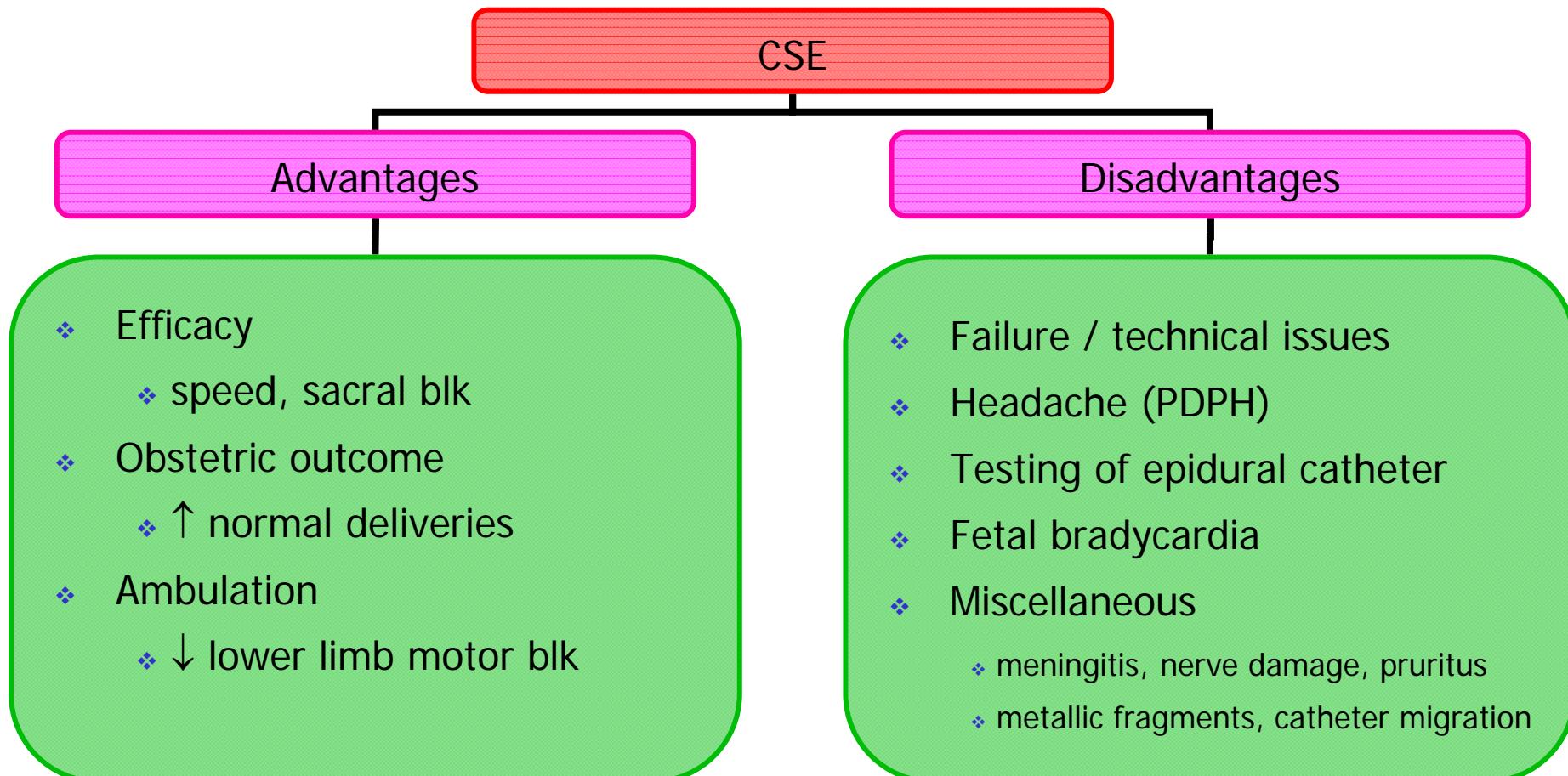
CSE: advantages / disadvantages



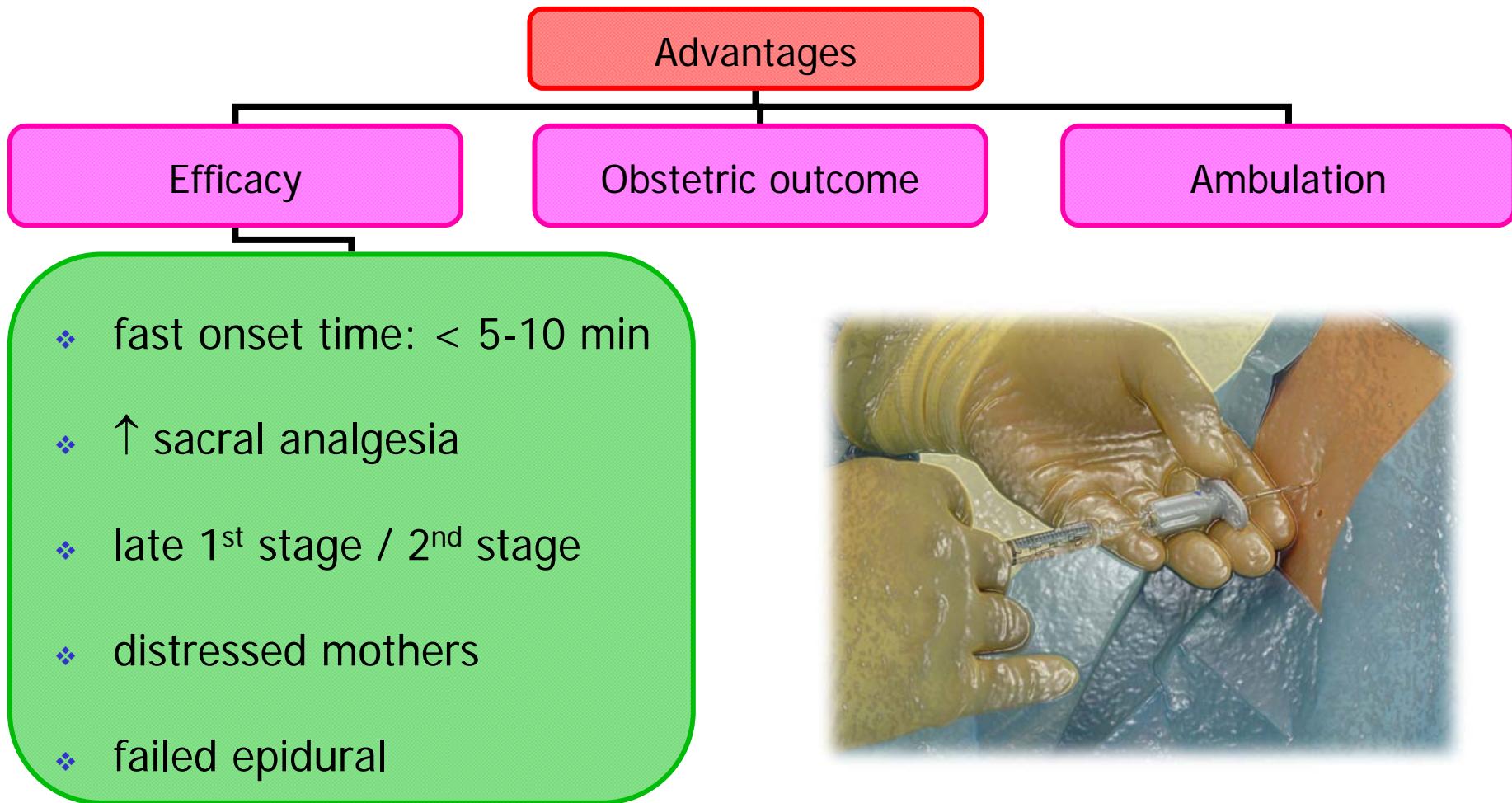
CSE : advantages / disadvantages



CSE : advantages / disadvantages



CSE : advantages



CSE : advantages

Advantages

Efficacy II

Obstetric outcome

Ambulation

- ❖ epid LDM straight after spinal
 - ❖ ↓ breakthrough pain
 - ❖ ↓ bupivacaine requirements



CSE : advantages

Advantages

Efficacy



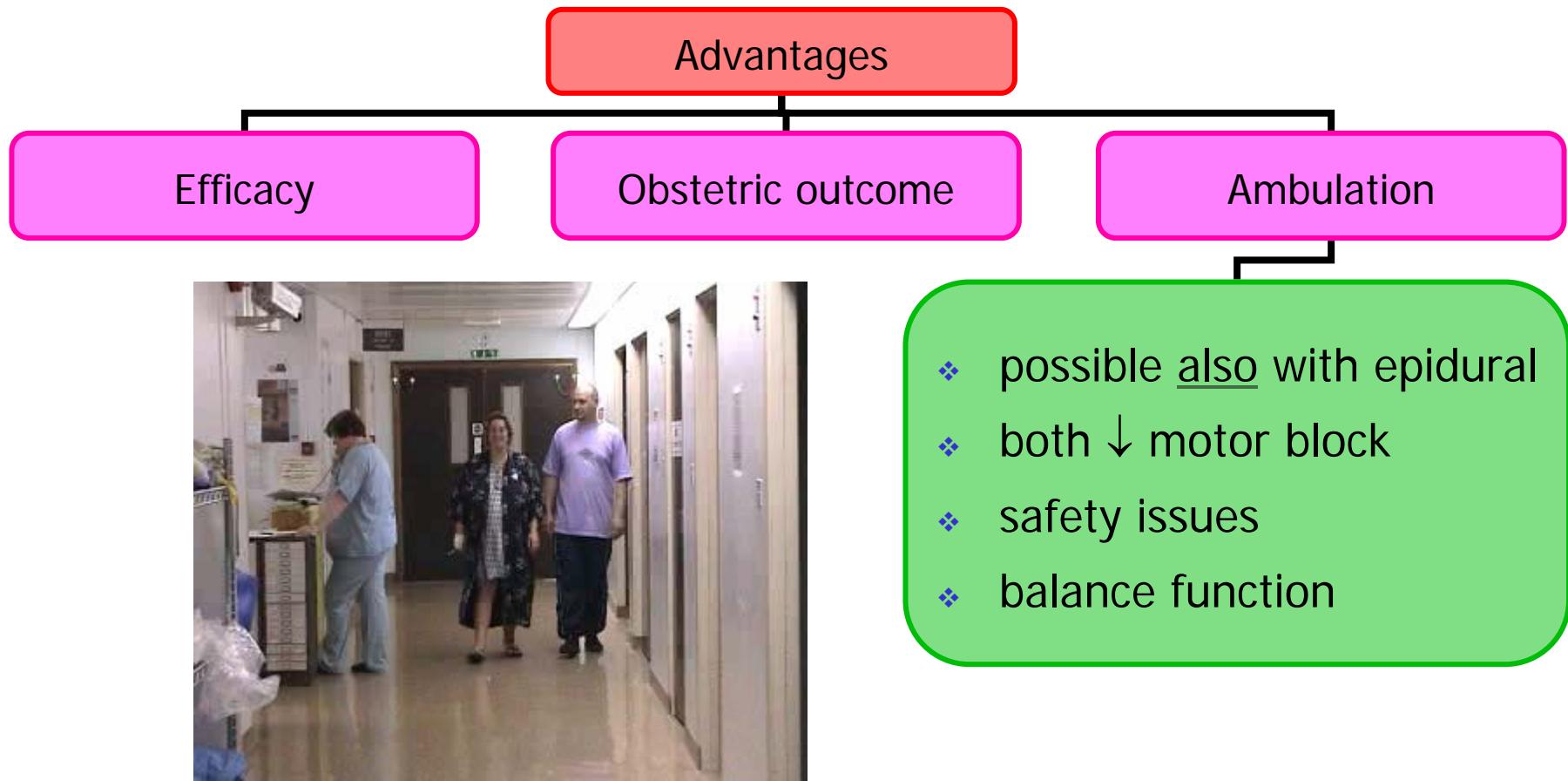
Obstetric outcome

Ambulation

- ❖ no differences !
- ❖ normal deliveries
- ❖ forceps / ventouse
- ❖ caesarean section



CSE : advantages



Walking CSE /epidural



Ambulation & obstetric outcome

- Nikodem
 - Cochrane '93 / '94
- Gupta
 - Cochrane '03
- Nageotte
 - NEJM '97
- Bloom
 - NEJM '98
- Collis
 - Anaesthesia '99
- Tsen
 - Anesthesiology '99
- Karraz
 - Int J Gyne & Obst '03
- Frenea
 - Anesth Analg '04

Ambulation & obstetric outcome

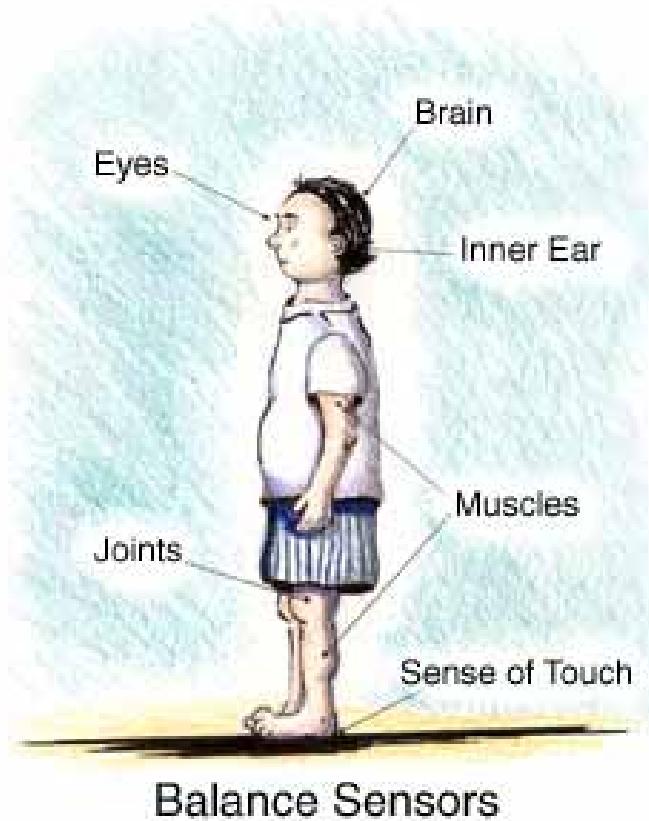
- Collis '99
 - CSE: ambulant **vs.** lying
- Tsen '99
 - CSE **vs.** epidural: ↑ cervical dilatation with CSE
- Karraz '03 / Vallejo '01
 - epidural: ambulant **vs.** lying
- Frenea '04
 - epidural: prolonged ambulation

Is walking safe after low dose CSE / epidural ?



Are falls more likely?

Balance function

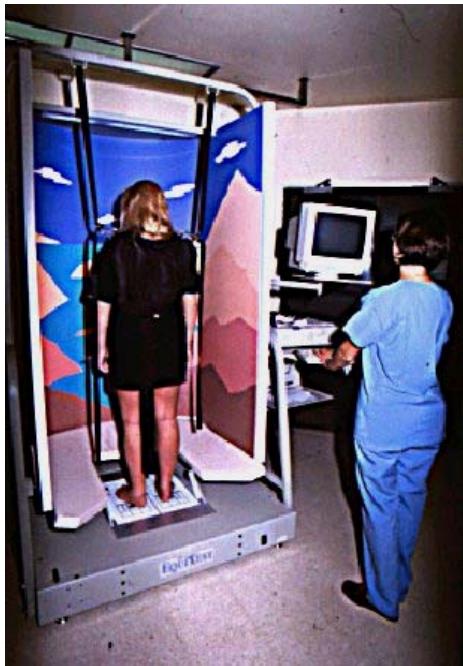


somatosensory / visual / vestibular

Can you prevent a fall with a test?

- Lower limb motor power
 - straight leg raising against resistance
- Dorsal column function
 - proprioception / Romberg's test
 - vibration
- Partial knee bend
- Step on/off foot stool

CDP: Computerized Dynamic Posturography



Equitest



Balance Master 6.1

Jeremy Davies



Tony Pickering



Andy McLeod



Posturography: Balance Master 6.1



Davies '02 (Anesthesiology)

Balance Master 6.1



Pregnant control – no epidural

Davies '02

(Anesthesiology)

Balance Master 6.1



Labouring mother 30 min after CSE

Davies '02 (Anesthesiology)

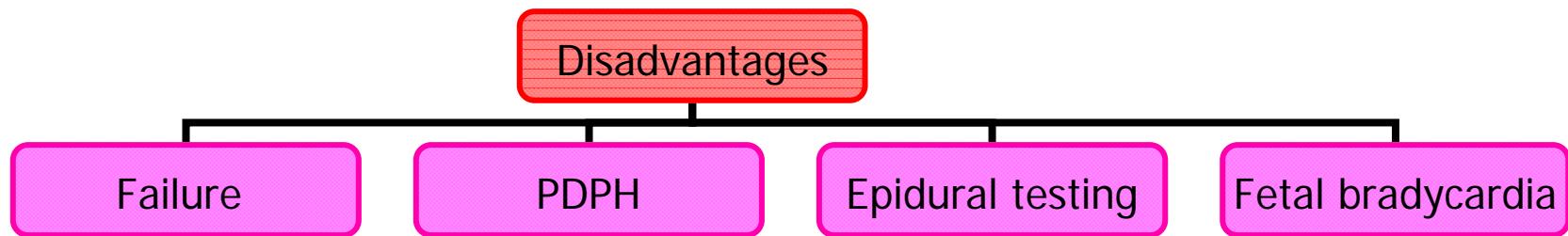
- 50 non-pregnant controls **vs** 50 pregnant controls
vs 50 pregnant after low dose CSE
- Non-pregnant controls better
 - scores in 6/13 tests **vs** pregnant and CSE gps
- No difference between CSE and pregnant control !



Summary: balance function after CSE

- Pregnant women ↓ balance function
- Labour CSE (**spinal**) does not affect balance
- Epidural top-ups may ↓ balance function

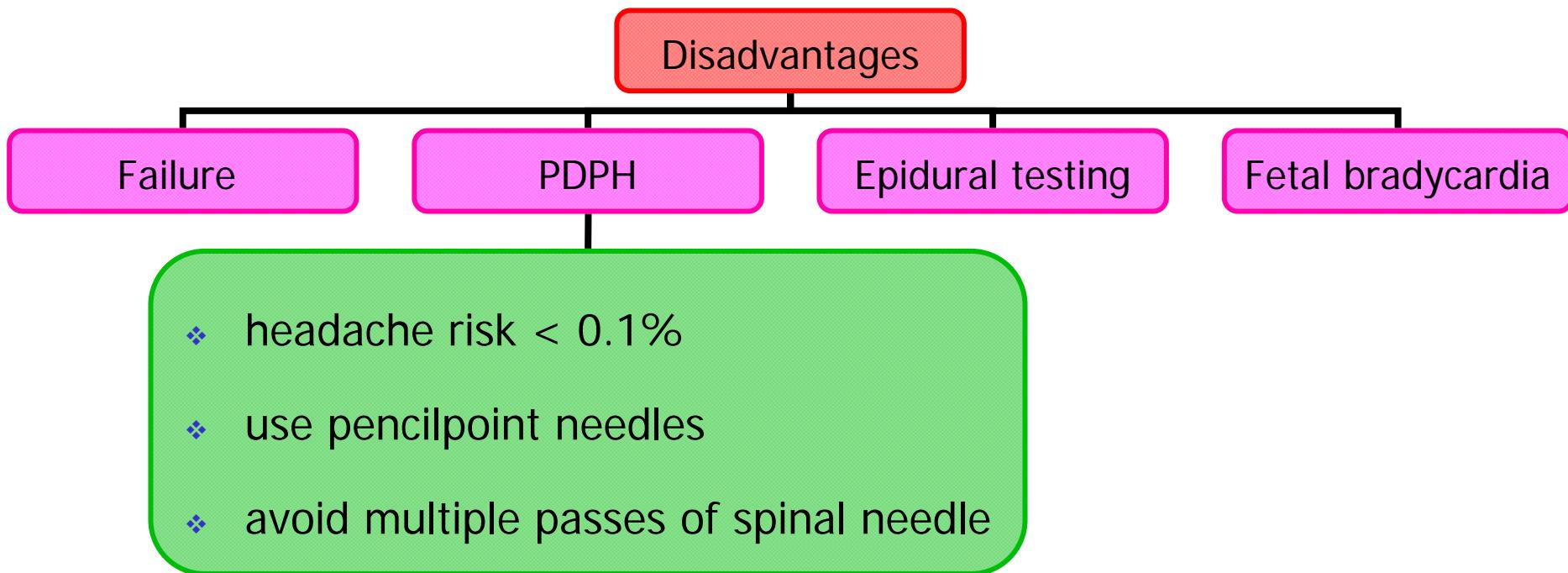
CSE : disadvantages



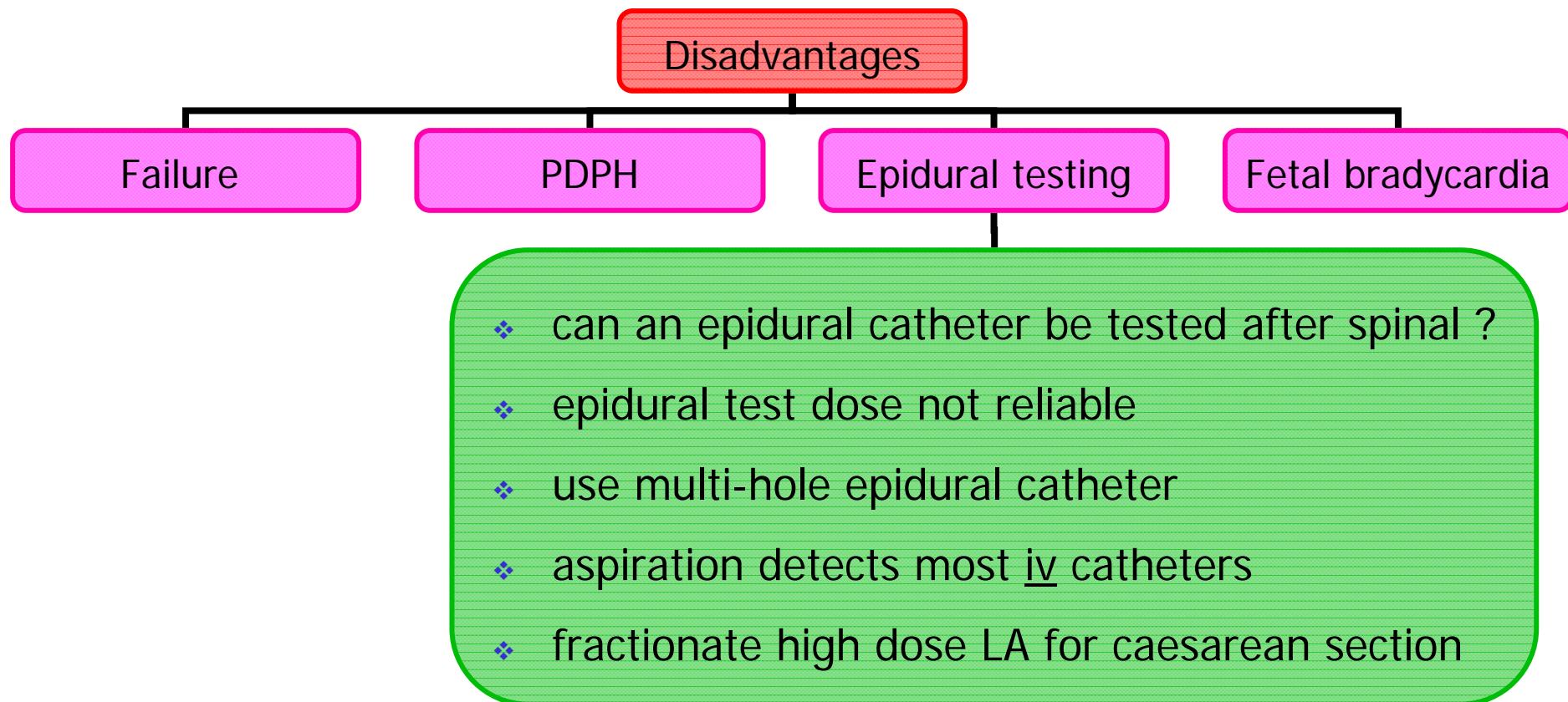
- ❖ ↓ with experience: < 0.4%
- ❖ needle movement
- ❖ inadequate drug dose



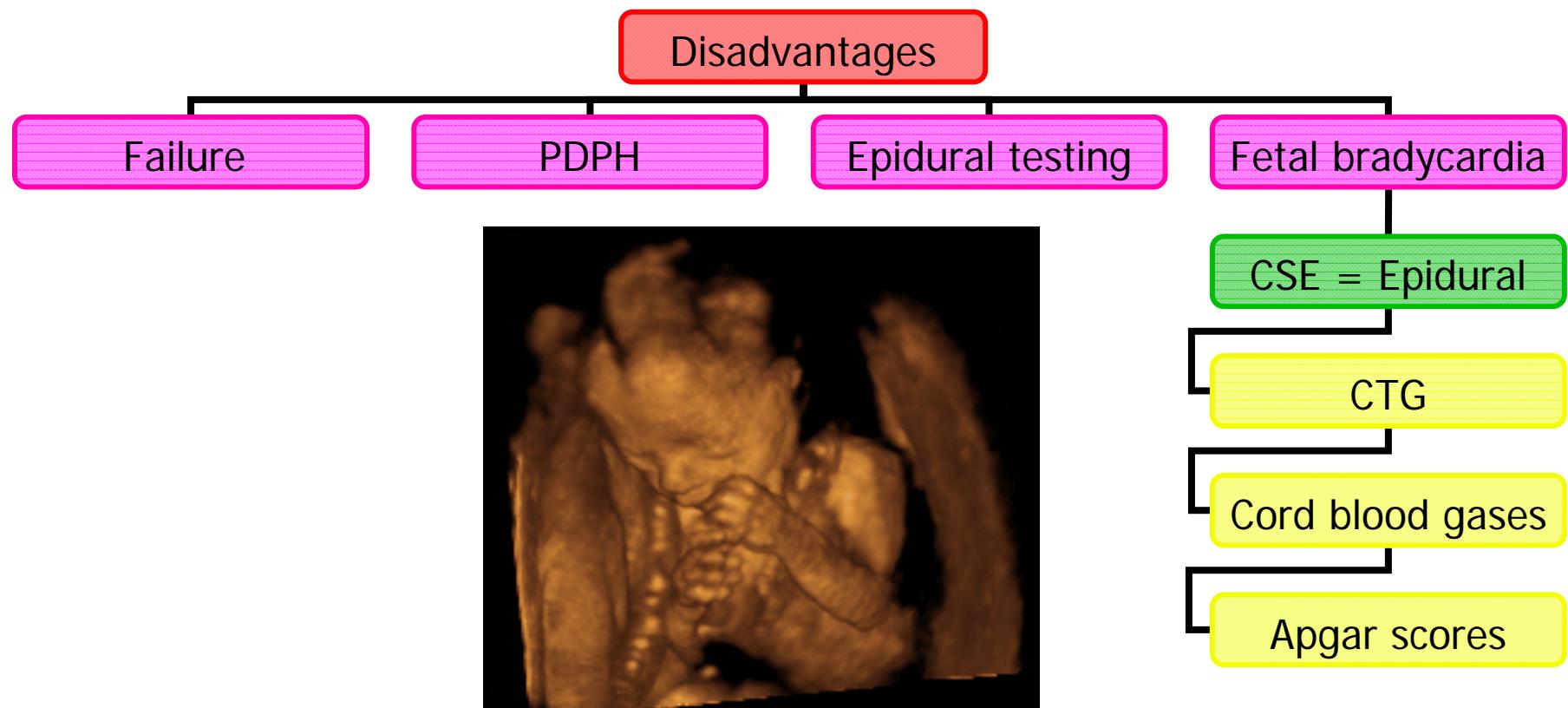
CSE : disadvantages



CSE : disadvantages



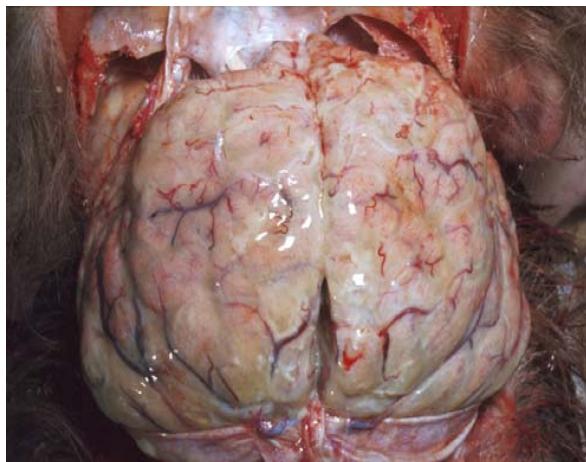
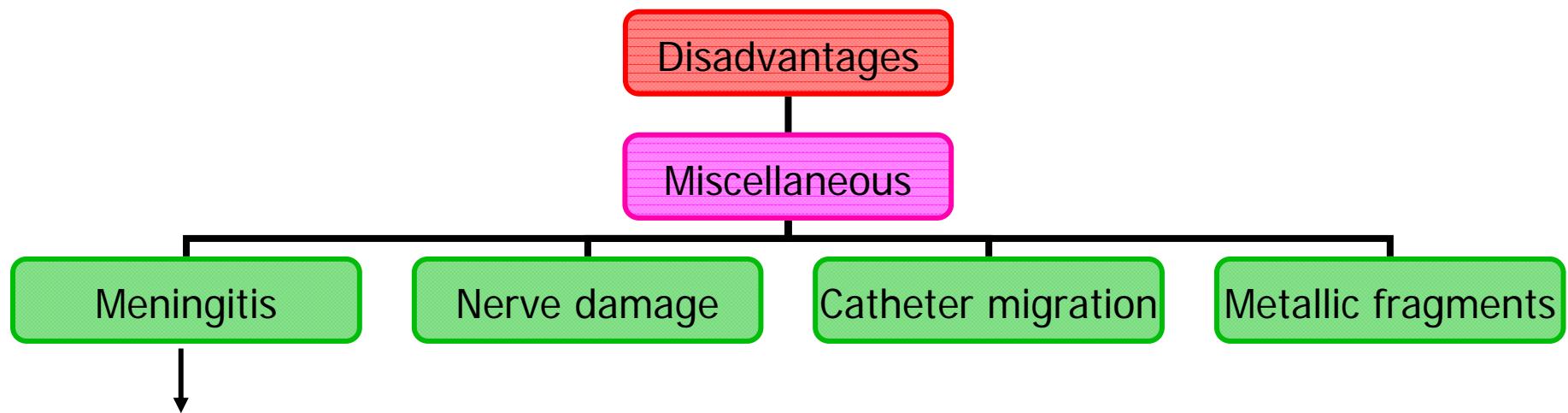
CSE : disadvantages



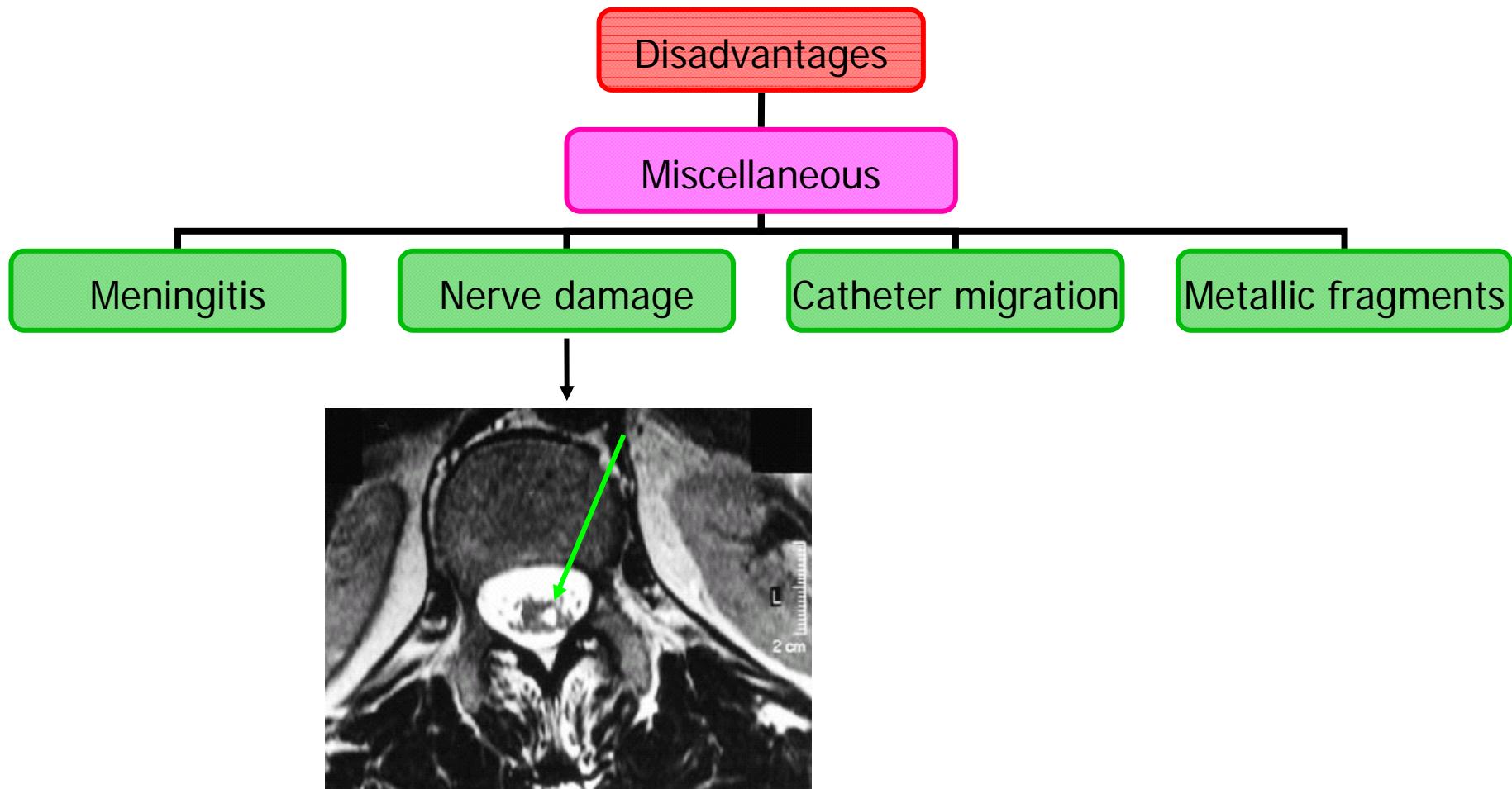
CSE & fetal bradycardia

- Mardirosoff (2002)
 - metaanalysis
 - ↑ fetal bradycardia with spinal opioids
- Van de Velde (2004)
 - epidural vs. CSE – **high / low dose sufentanil**
 - ↑ spinal opioid dose → ↑ fetal bradycardia (**7µg sufent**)
- Rapid analgesia → **epinephrine / norepinephrine imbalance**
→ **uterine hypertonus (?)**

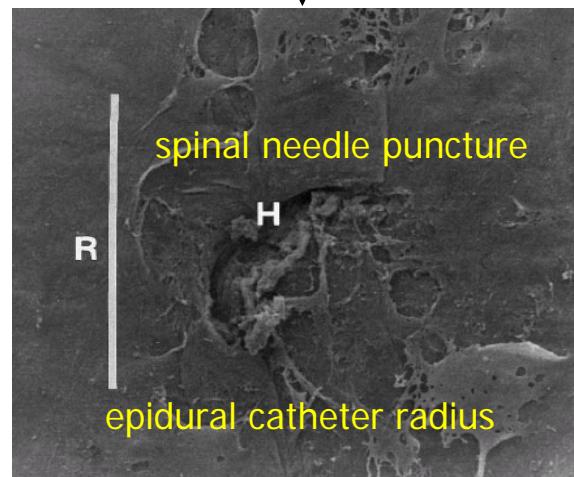
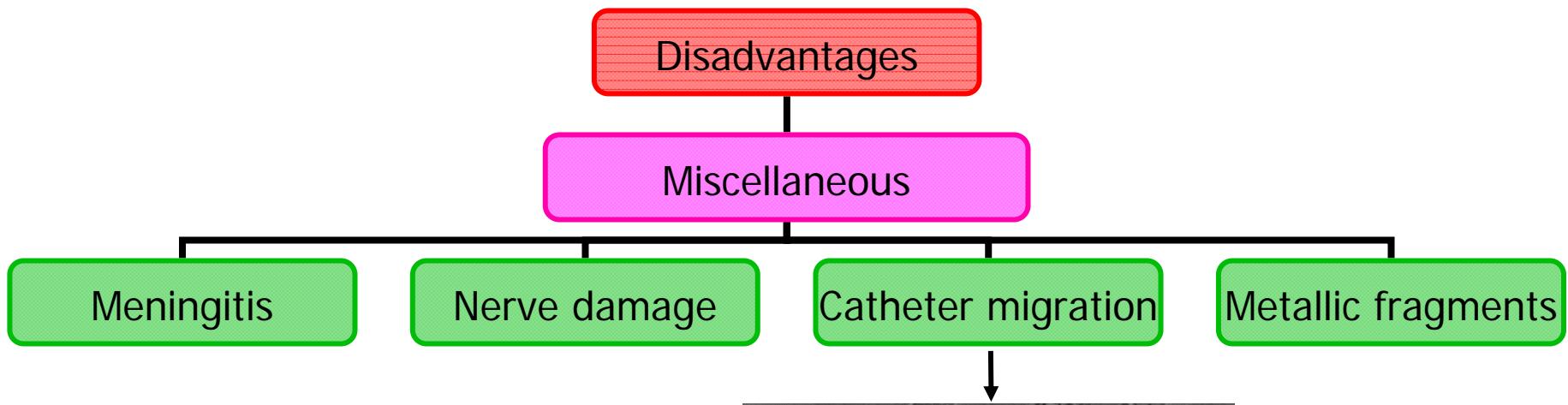
CSE : disadvantages



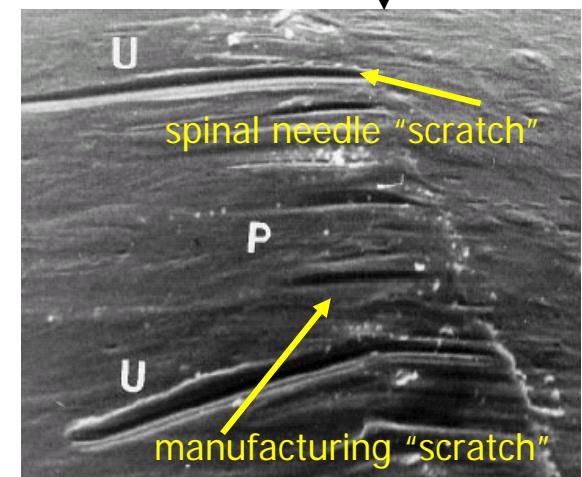
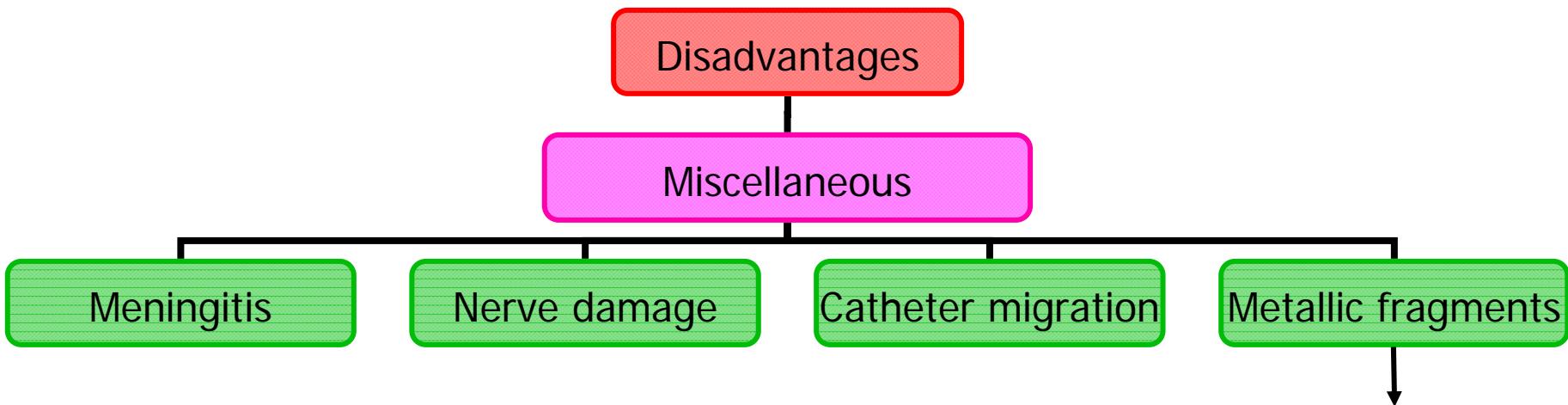
CSE : disadvantages



CSE : disadvantages



CSE : disadvantages



CSE : disadvantages

- Pruritus

- ↑ with spinal opioids
- dose dependent
- treatment available

- Respiratory depression

- very rare event / dose dependent
- high dose sufentani – **early days of CSE!**

CSE - recent developments

- Bupivacaine **vs.** levobupivacaine **vs.** ropivacaine
 - Camorciano '05 / Van de Velde '07
- Effect of spinal injection volume
 - Parpaglioni '05; ↑ injection vol → ↑ efficacy
- CSE vs. epidural – analgesia outcomes
 - Thomas '05; no difference

CSE - recent developments

- Bupivacaine **vs.** levobupivacaine **vs.** ropivacaine
 - Camorciano '05 / Van de Velde '07

Bupiv vs. levo vs. ropiv

- Camorciano

- MLAD / ED50 study
 - potency: bupiv > levo > ropiv



- Van de Velde

- full dose response study (ED95 + ED50)
 - potency: bupiv > levo & ropiv



CSE - recent developments

Bupivacaine vs. levobupivacaine vs. ropivacaine

Camorciano '05 / Van de Velde '07

- Effect of spinal injection volume
 - Parpaglioni '05

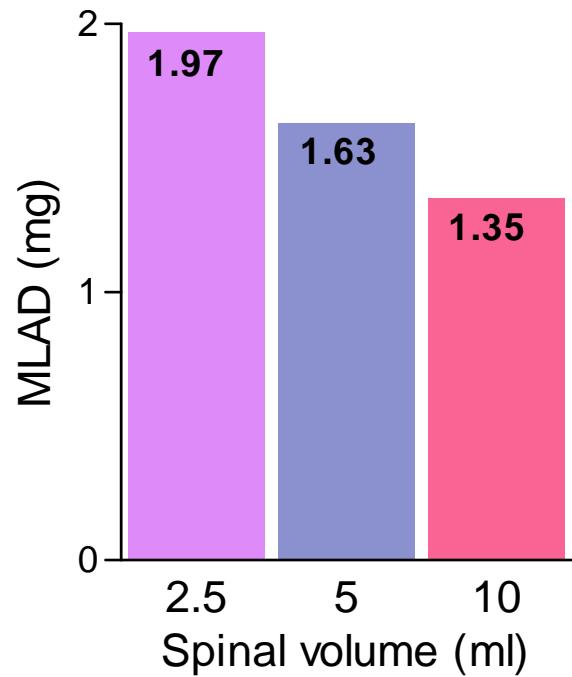
CSE vs. epidural outcomes

Thomas '05

CSE - spinal inj volume

Parpaglioni – Anesthesiology – Effect of different volumes of spinal levobup for labour

- Spinal levobupivacaine at different volumes (2.5, 5 & 10ml; n=93)
- Up / down sequential allocation
- ↑ injection volume → ↓ MLAD
- ↑ vol → ↑ effect



CSE - recent developments

Bupivacaine vs. levobupivacaine vs. ropivacaine

Camorcina '05 / Van de Velde '07

Effect of spinal injection volume

Parpaglioni '05

- CSE vs. epidural - outcomes
 - Thomas '05

CSE – outcome

Thomas – Anesthesiology – Does dural puncture during CSE improve epid function?

- CSE **without** spinal drug injection vs epidural catheter only technique
- PCEA analgesia with low dose fent/bupiv
- No group differences:
 - epidural catheter manipulation / replacement
 - unilateral blocks / analgesia quality



CSE – the future?

- Epidurals for early labour
- CSE
 - late labour / maternal distress
 - difficult delivery / failed epidural
- Spinal volume effects
- Analgesia maintenance (**automated bolus**)

Thank you!