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FIRST FACULTY
OF MEDICINE
Charles University



GENERAL UNIVERSITY
HOSPITAL IN PRAGUE

ANALGESIA AND ANESTHESIA IN OBSTETRICS

Childbirth is a natural physiological process
that gives
many women happiness and satisfaction



Birth of the baby

...the spontaneous birth of a human child typically results in very intense feelings for the mother, along with emotional and physical burdens





Childbirth and labor are thus synonymous with pain and/or significant somatic and emotional stress



Pain

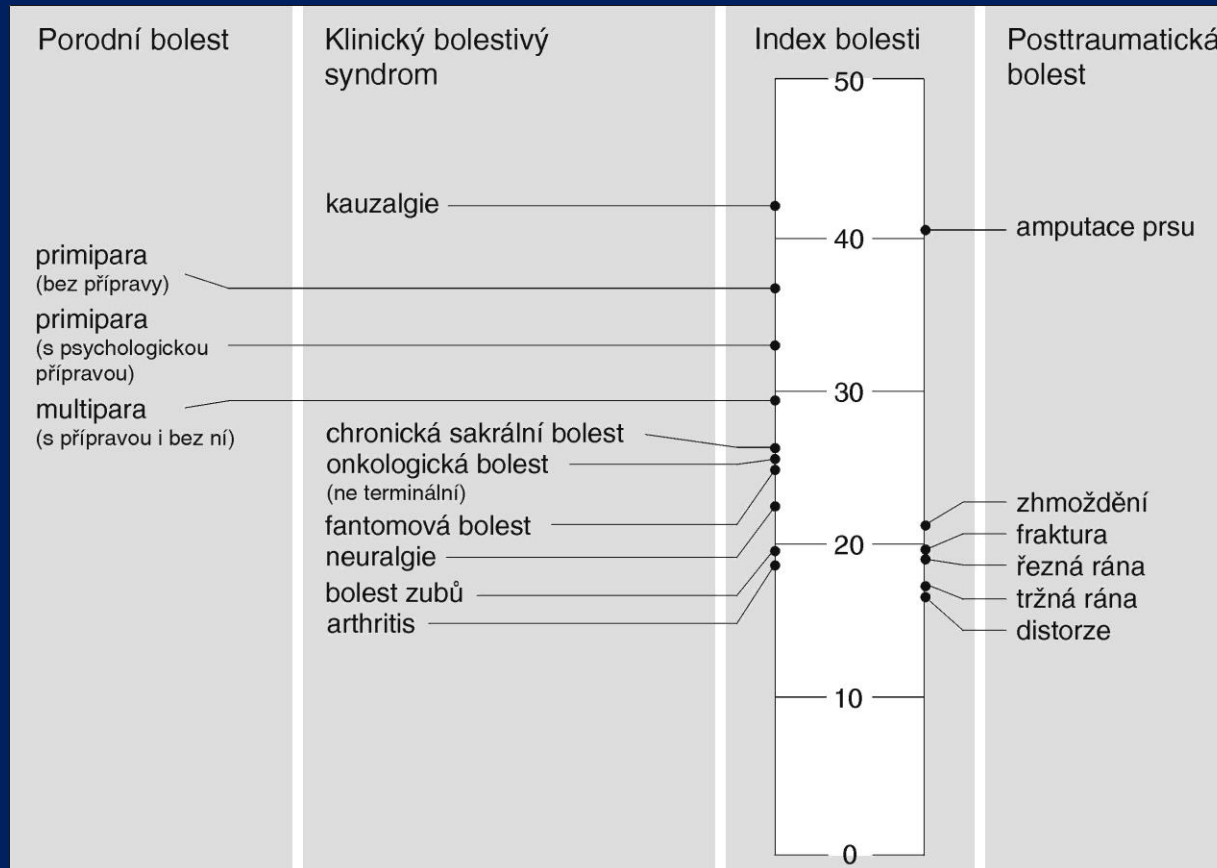
typical sign
of human
labour and delivery



Human labour is painfull ...

Comparison of pain scores obtained from women during labour

...some women having extremely severe pain
...physical as well as psychologic factors contribute to the severity of labour pain



MELZACK, R. The myth of painless childbirth (The John J. Bonica lecture). Pain, 19, 1984, p. 321–337.



Human labour is painful ...

Why???

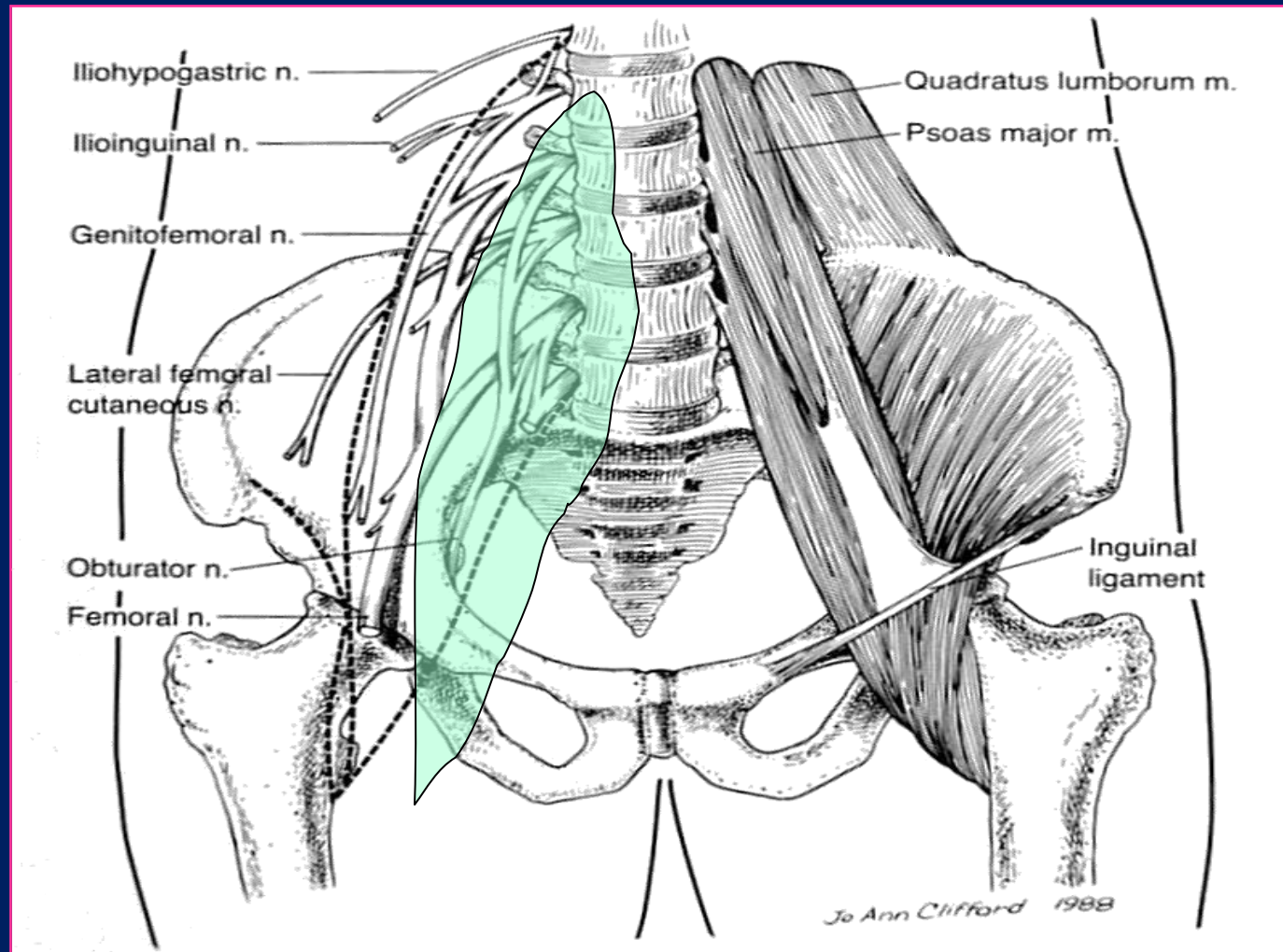


Mammalia???

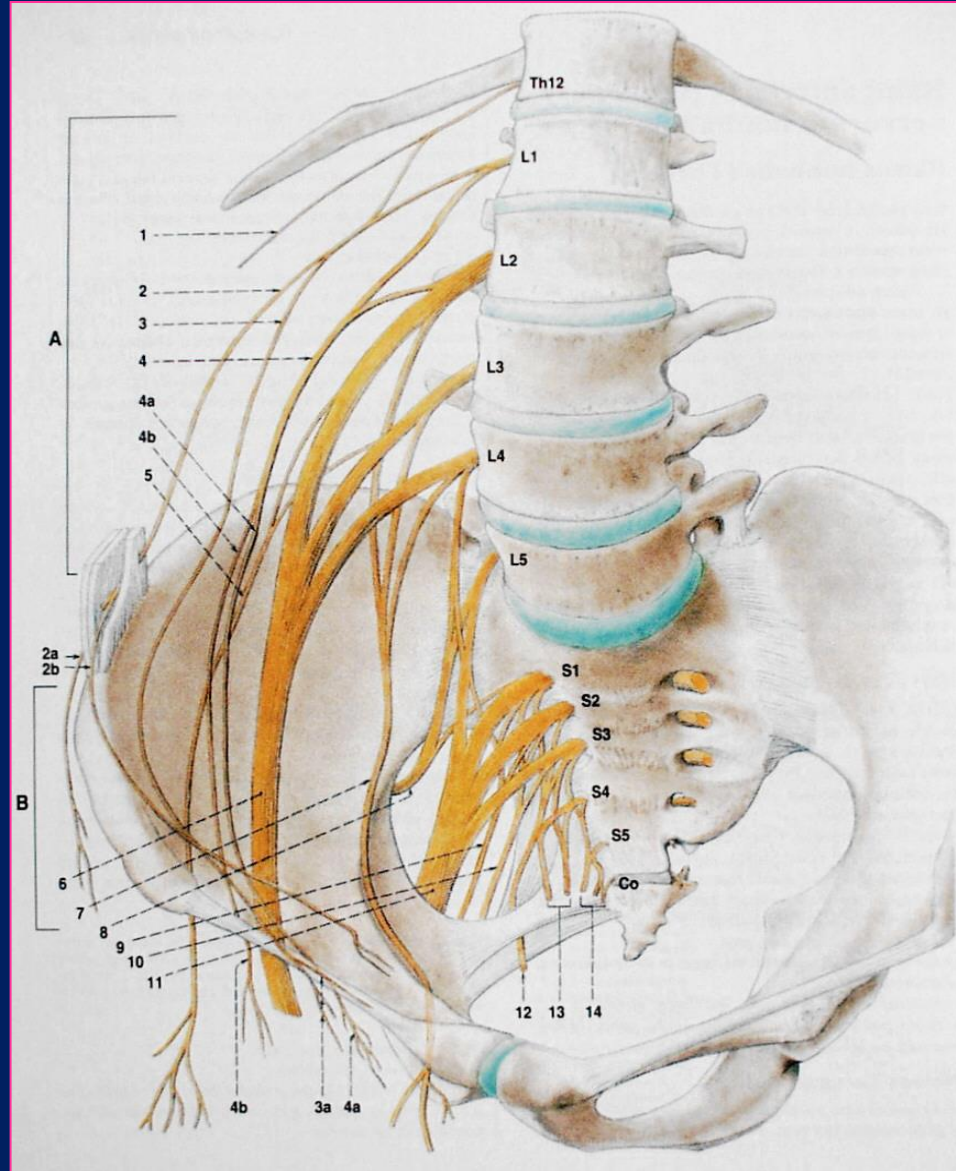
Main reason
of pain
orthostatism



Human pelvis = complicated system



Especially lumbosacral area

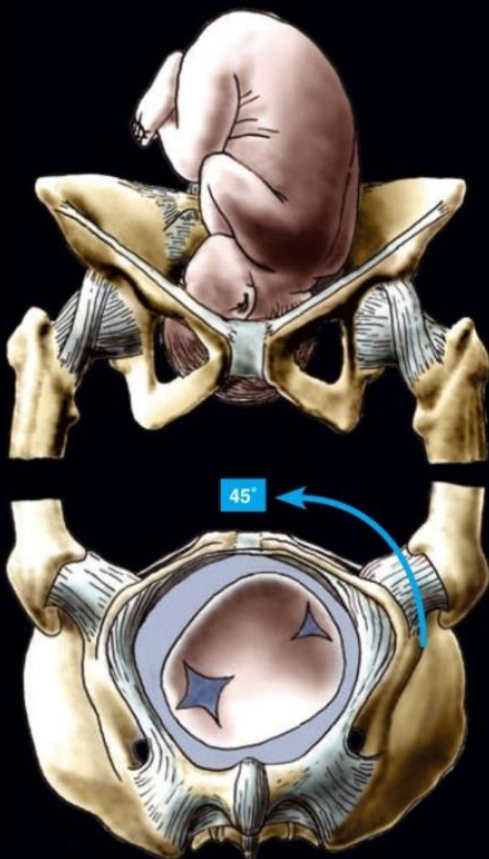




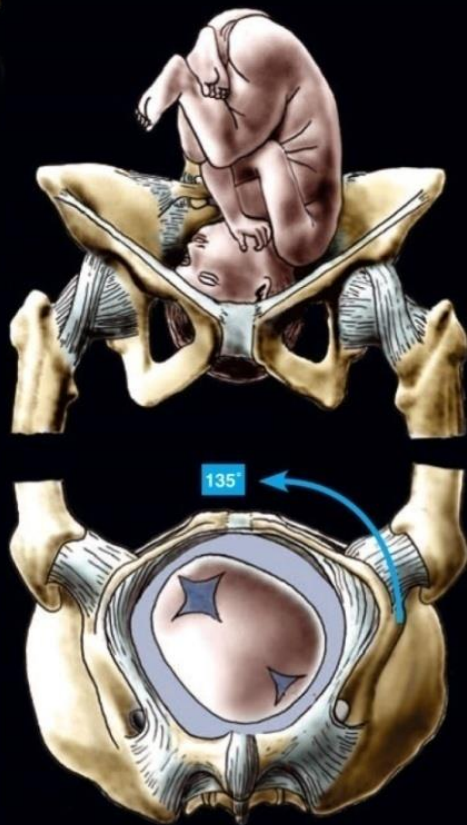
General comments

Two sources of pain in childbirth:

- 1) visceral at T10 - L1 from uterine contractions and cervical dilatation
-
- 2) somatic at S2 - S4 from head descend and pressure on pelvic floor, vagina and perineum



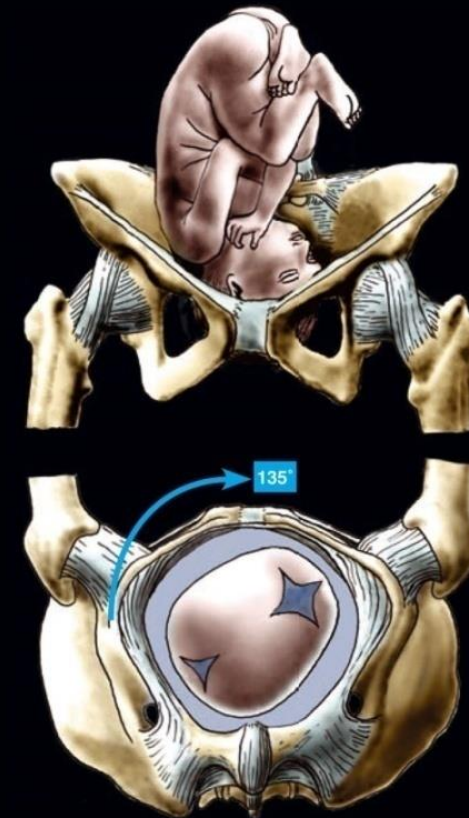
↑ **Levé přední postavení**
(u 60 % rodiček).
Hlavička plodu rotuje 45°



↑ **Levé zadní postavení**
(u 5 % rodiček).
Hlavička plodu rotuje 135°. Porod
je delší a bolestivější, dokonce i po
podání epidurální analgezie



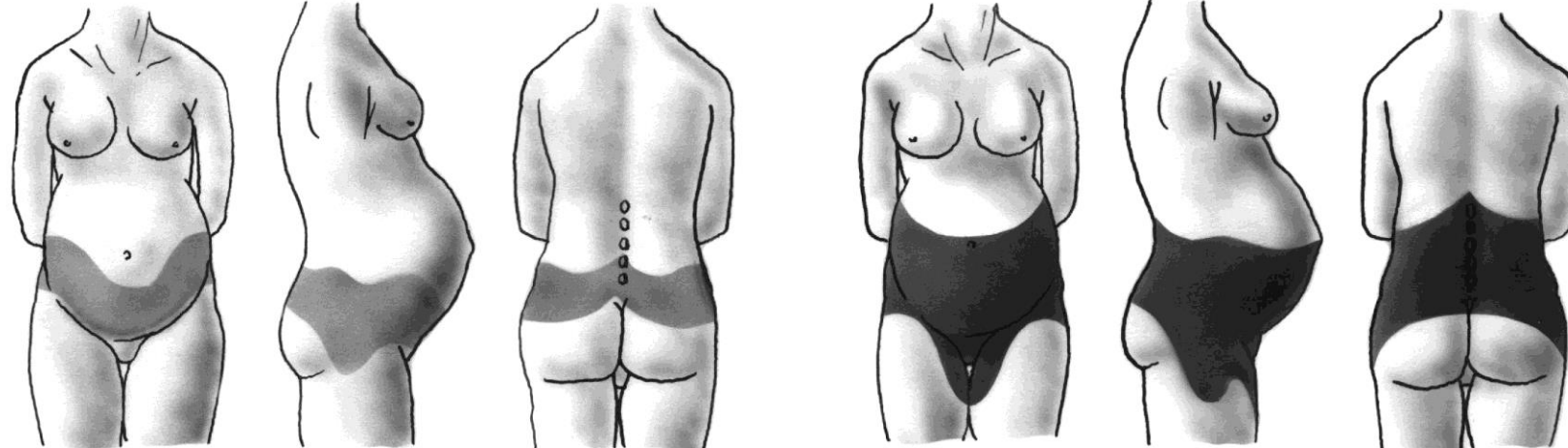
↑ **Pravé přední postavení**
(u 5 % rodiček).
Hlavička plodu rotuje 45°



↑ **Pravé zadní postavení**
(u 30 % rodiček).
Hlavička plodu rotuje 135°. Porod
je delší a bolestivější, dokonce i po
podání epidurální analgezie

The first stage of labour

- ischaemia of the myometrium
- stretching of the cervix



časná fáze I. doby porodní – slabá bolest

pozdní fáze I. doby porodní – silná bolest



Obstetric pain activate changes

- psychological
- respiratory
- cardiovascular
- endocrine
- metabolic



Negative effect to uterus and fetus



Pain relief in labour

- maternal request is a sufficient medical indication for pain relief in labour



Normal Labor and Delivery

versus

High Risk Pregnancy

Premature labour





670 g





Superobezita

Těhotné s BMI ≥ 50

















Aim of obstetric management

Stress Control = Pain Control

Protection before hyperstress

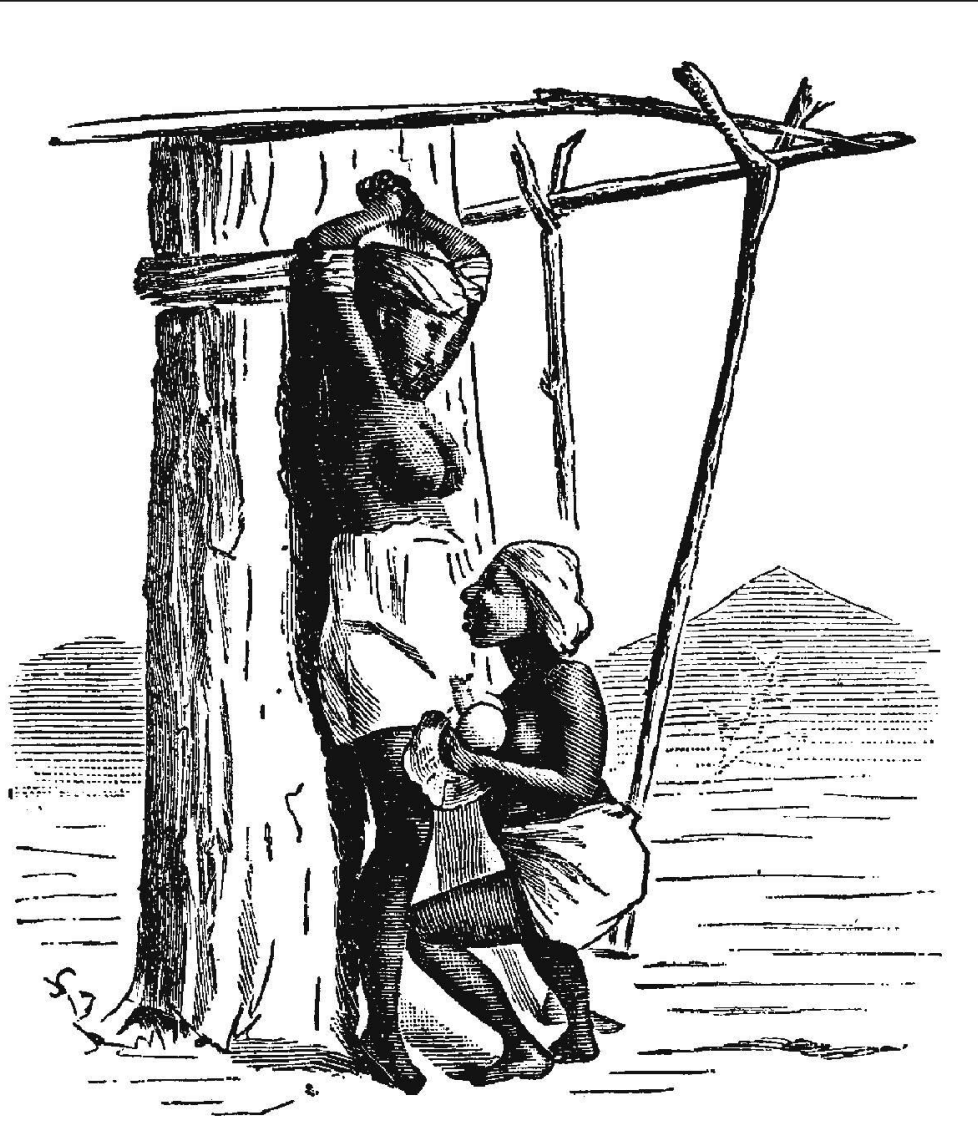
Protection of haemodynamics



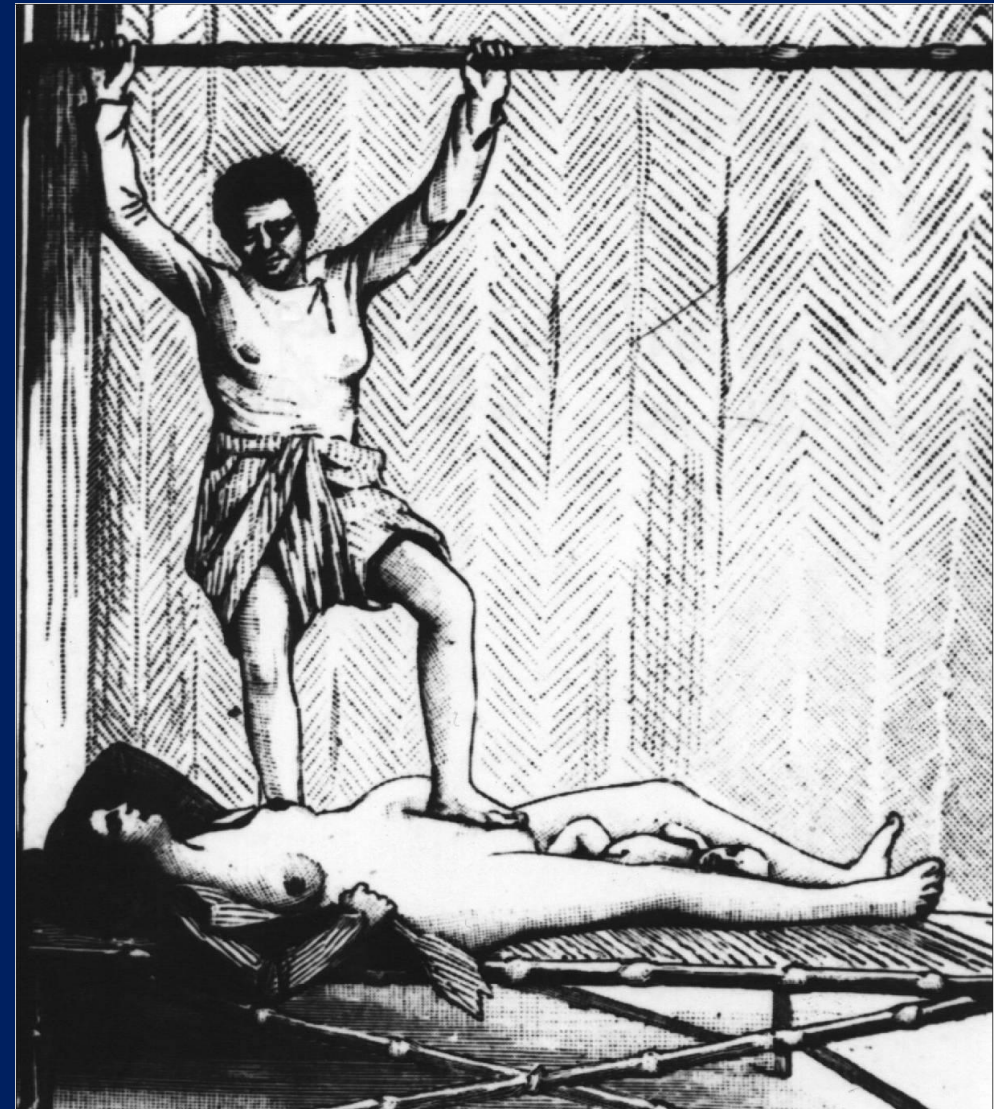
Mother

- relief of pain
- by relieving pain the changes of ventilation, circulation, hormonal function that ordinarily accompany pain can be controlled
- freedom from fear
- safe and relatively painless delivery

Progress of obstetric analgesia

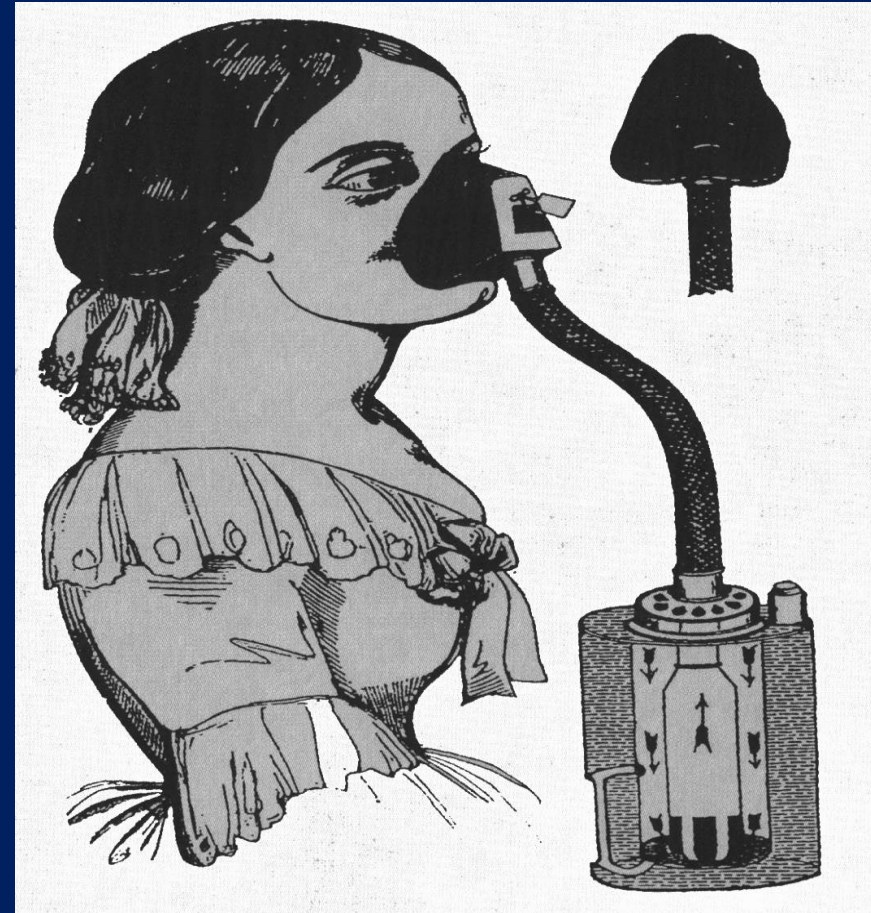
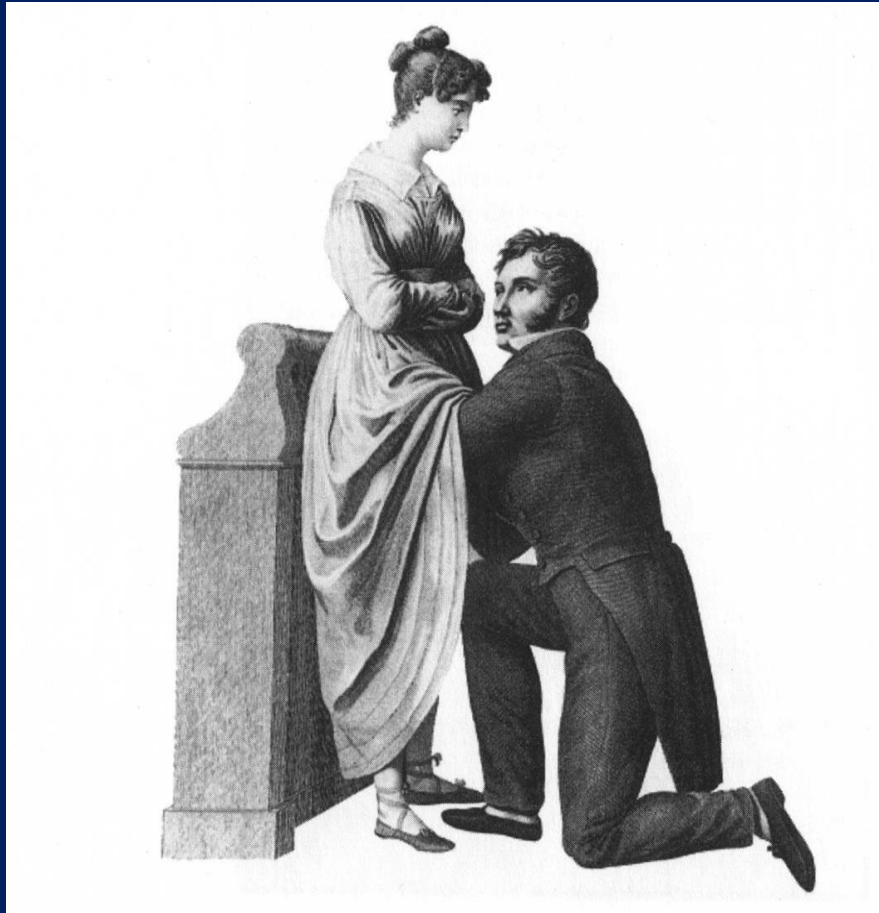


Occultism
and
Rituals



Progress of obstetric analgesia

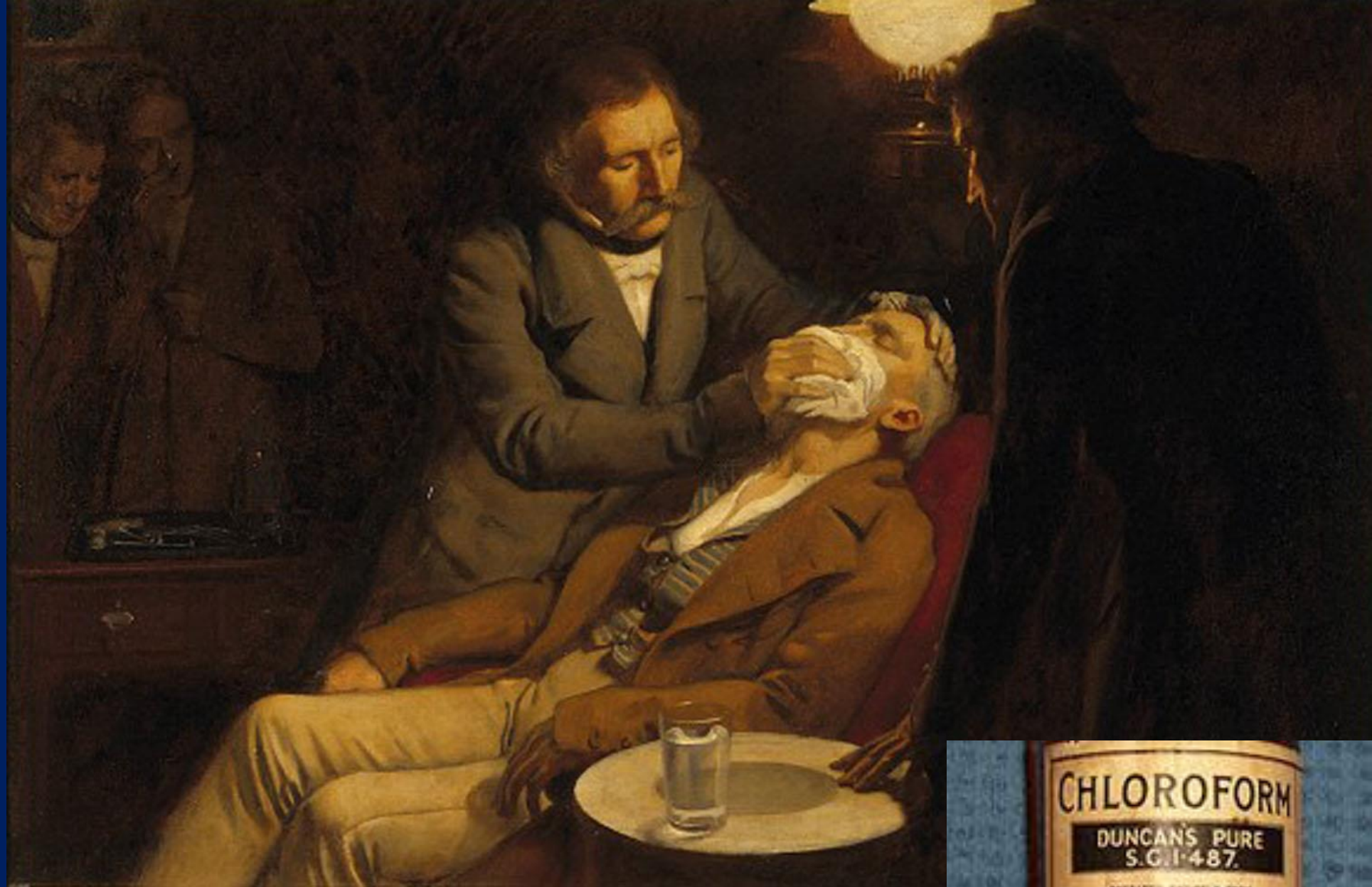
Empiricism











CHLOROFORM

DUNCAN'S PURE
S.G. 1487.

PREPARED ENTIRELY FROM
BRITISH ETHYLIC ALCOHOL

BY
DUNCAN, FLOCKHART & Co.
LEINBURGH AND LONDON.

Progress of obstetric analgesia

Scholarship
and
Rationality





The ideal analgesic

should work:

- swiftly,
- provide adequate pain relief for mother



The ideal analgesic

does not exist !!!



Obstetric Analgesia

Every methods
have

the advantages

and

the disadvantages



Obstetric Analgesia

- non-pharmacological
- pharmacological
 - pharmacological - inhaled
 - pharmacological - parenteral
 - pharmacological - regional



Obstetric Analgesia

Non-pharmacological

- psychological support
- relaxation
- breathing exercises
- hypnosis
- acupuncture
- transcutaneous nerve stimulation (TENS)



Hypnosis and Acupuncture

- these techniques may be of value

GV 6 (ŤI-ČUNG)
pod Th₁₁

B 32 (CCH-LIAO)

GV 2 (JAO-JÜ)
zadní střední dráha

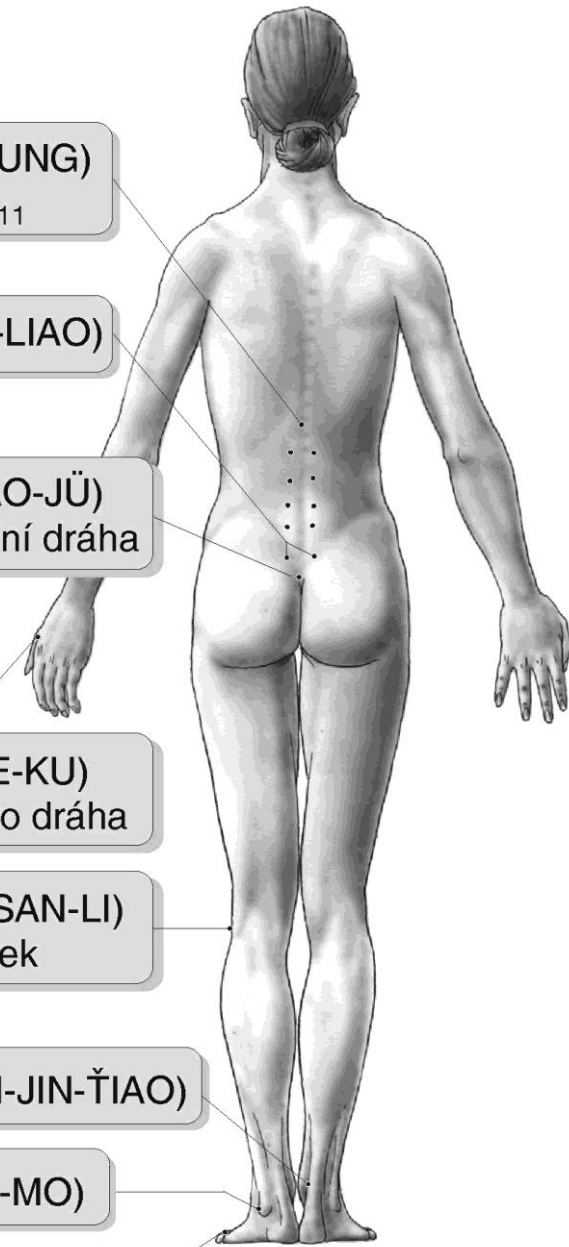
L 4 (CHE-KU)
tlusté střevo dráha

S 36 (CU-SAN-LI)
žaludek

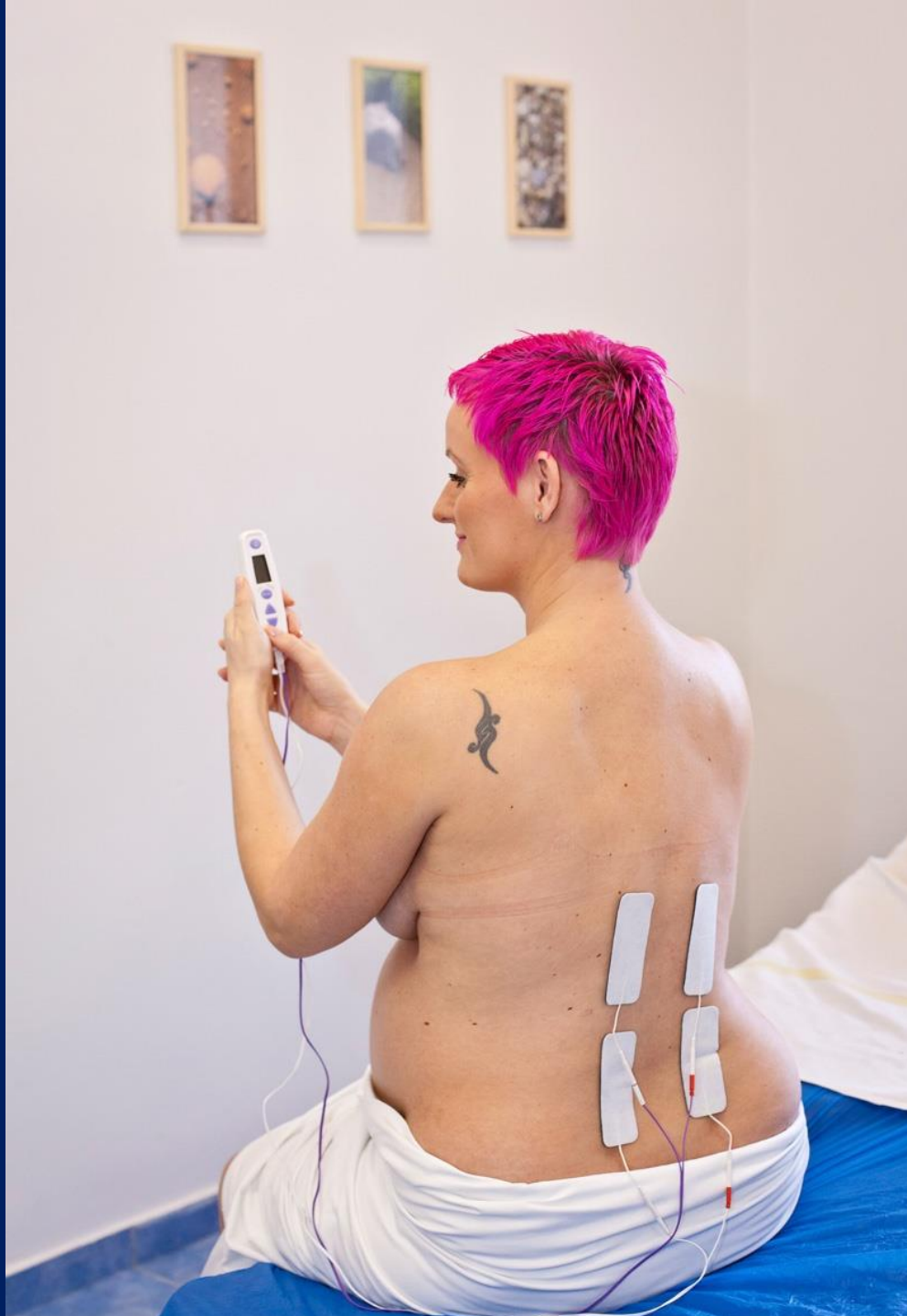
SP 6 (SAN-JIN-ŤIAO)

B 62 (ŠEN-MO)

B 67 (Č'-JIN)
močový měchýř









Phytotherapy – the use of herbal extracts
(aromatherapy)

Aromatherapy can include the use of plant oils to which are usually added aromatic essences. The most common are sunflower, olive, sesame or almond oils. Added to the natural compounds in the oil are individual or combinations of lavender, chamomile, nutmeg, jasmine, sage, black pepper, tea tree, etc. These compounds are usually applied using massage, warm compresses, or inhalation.

Advantages:

Simple to administer

Disadvantages:

Lower analgesic effectiveness

Analgesic effectiveness: less than 10 %







Audioanalgesia

Listening to sounds or music can reduce the perception of pain even without the use of medicines. The principle is based on taking the mind off the pain during uterine contractions. Mothers control the audio equipment themselves.

Advantages:

- Simple to administer

- Does not negatively influence the mother or child

Disadvantages:

- Lower analgesic effectiveness

Administered by: the mother, with the help of a midwife





The use of water for reducing labor pains (hydroanalgesia)

A bath or relaxing shower combined with cool or warm compresses and hot-water bottles placed on the mother's lower back has become a more common method over the past thirty years.

The basic hydroanalgesic methods used for labor pains are:

- relaxing baths
- giving birth in the water
- intradermal local injections of sterile water

Advantages:

Simple to administer

Does not negatively influence the mother or child

Disadvantages:

Lower analgesic effectiveness

Administered by: midwife, intradermal water injections are given by a physician

Obstetric Analgesia

Pharmacological - inhaled
mixtures of nitrous oxide and oxygen

Entonox
is a 50:50 mixture of the two gases.

Entonox takes 30 sec
to act and continues for approximately
60 sec after inhalation has ceased.











Entonox

The advantages of Entonox are:

- the absence of respiratory depression in the fetus
- that uterine action is unaffected
- its rapid clearance from the body, allowing its intermittent use over several hours
- its suitability for patients with pulmonary or cardiac pathology
- its simplicity
- that it is patient controlled
- its low cost



Entonox

Disadvantages include

- exhaustion - the woman has to take deep breaths to obtain full analgesia
- its limited efficacy
- the need for complicated equipment which must be regularly checked



Obstetric Analgesia

Pharmacological - parenteral

- pethidine (Dolsin)
- nalbuphin (Nubain)

- mild sedatives
- tranquillisers
- promethazine



Does pethidine still have a place in the management of labour pain?

Richard W. Watts, Rural General Practitioner, Port Lincoln, South Australia

Summary

Pethidine can provide short-term relief of acute labour pain. However, its active metabolite, norpethidine, can have effects that last longer than pethidine, so epidural analgesia may be preferred.

Key words: analgesia, breastfeeding, epidural.

Introduction

Many women prefer to experience birth actively and without pain. This is discussed and reviewed regularly. If required, a woman can have a positive influence on the course of labour and a more powerful analgesic efficacy with minimal maternal and fetal side effects.

Pethidine was first introduced in Germany in 1957 and is now the most widely used systemically administered analgesic given by midwives. While pethidine relieves acute labour pain, there is also the potential for maternal and neonatal side effects.



Nalbuphin Orpha

Nalbuphinhydrochlorid



MODERNÍ ANALGETIKUM

κ -AGONISTA, μ -ANTAGONISTA

NEPODLÉHÁ OPIÁTOVÉMU ZÁKONU

ŠIROKÉ TERAPEUTICKÉ POUŽITÍ

ZKRÁCENÁ INFORMACE O PŘÍPRAVKU

Nalbuphin Orpha, 10 mg/ml injekční roztok. Měrné: Nalbuphinhydrochloridum 10 mg v 1 ml injekčního roztoku. Indikace: Křátko-steroidní léky s různými silnými a slabšími indikacemi. Předepisování a podávání: Dávková forma a způsob podání obvyklé dávka je 10 - 20 mg (0,1 - 0,2 mg/kg tělesné hmotnosti), může se opakovat za 3 - 6 hodin. Dávka od 10 mg/ml a silnějších doporučená dávka je 0,1 - 0,2 mg/kg tělesné hmotnosti, může se opakovat za 3 - 6 hodin. Pro léčbu dětí do 18 měsíců nejsou dostupné údaje. U starších pacientů se doporučuje snížit dávku o nejvyšší dávku. U pacientů s mírnou a středně závažnou poruchou funkce ledvin se doporučuje opatrnost. Přípravek není vhodný pro silně závislou léčbu. Kontraindikace: Přecitlivělost na složky přípravku, těžká porucha funkce ledvin, porucha funkce jater, současné podávání se jinými opioidy, ledvin, ledvinové onemocnění. Významné interakce: Současné podání čistých μ -agonistů způsobí v neutralizaci způsobuje kompetici na μ -opioidních receptorech a v důsledku toho snížení analgetického účinku. Alkohol zvyšuje metabolismus účinných analgetik. Je nutné se vyvarovat silně alkoholických nápojů a léků s příznaky závislosti na nich. Upozornění: Jiné přípravky účinné centrální nervový systém - jiné deriváty morfinu (analgetika a antitussiva), sedativní antidepresiva, sedativní H1 antihistaminika, barbituráty, benzodiazepiny, vazodilatika jiné než barbitol, neuroleptika, kloni-

din a příslušné léky mohou vyvolat riziko respirační deprese, a v případě předléčkování jsou potenciálně léty srovnatelné. Nejsou k dispozici žádné informace týkající se farmakodynamických interakcí mezi nalbuphinem a jinými léčivými přípravky. Doporučuje se opatrnost, zejména je nalbuphin kombinován se jinými inhibitory enzymů nebo s léčivými přípravky s širokým terapeutickým spektrem. Místní vedlejší účinky: Sedace, pocit ospalosti, závratě, suché v ústech, bolest hlavy, dysurie, zvracení, nauzea. U pacientů, kteří nedostatečně uchlazení, může Nalbuphin Orpha vyvolat určitou abstinenci příznaků. Pokud je Nalbuphin Orpha aplikován v průběhu porodu, může způsobit respirační deprese u novorozence. Uchovávejte ampulky v krabici, aby byly chráněny před světlem. Druh obalu a velikost balení: Ampulky z bezbarvého skla (typ II), 2 ml ampulky v balení po 10 ampulích. Dávka roztoku: Orpha-Deva. Hranice a ul. Vrtiška 8/raň, Westergasse 25/1 B, Rakousko. Registrační číslo: 6643287-C. Datum revize textu: 2. 9. 2006

Podrobnější informace získáte v souhrnu údajů o přípravku. Přípravek je považován za lék, který předepisuje a je dostupný formou s právními vady jeho zavedení je podmíněno.

Chiesi

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BOLEST



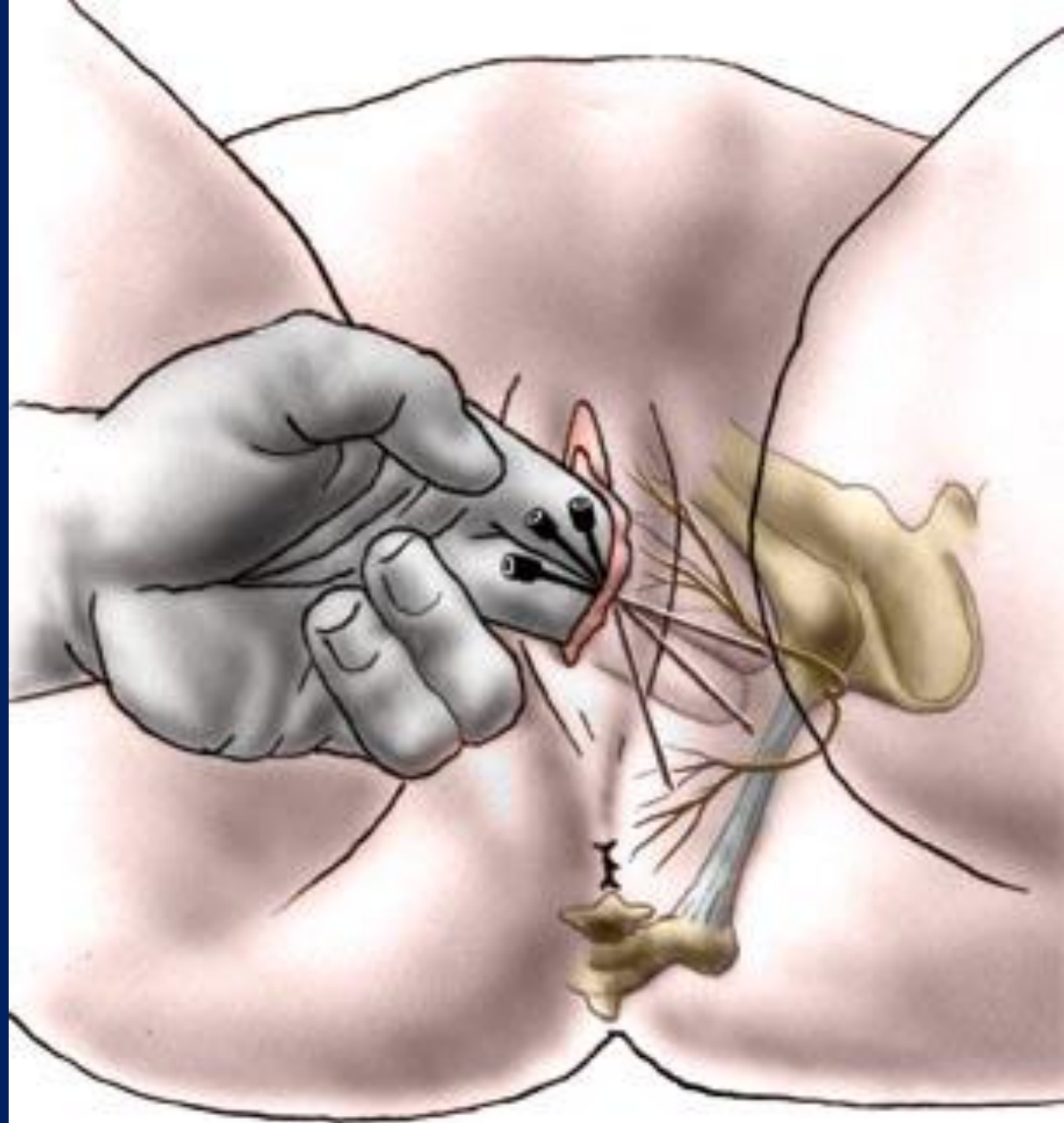
Obstetric Analgesia

Pharmacological - regional

- pudendal block
- paracervical block
- caudal epidural
- epidural block
- spinal block
- combined epidural/spinal block

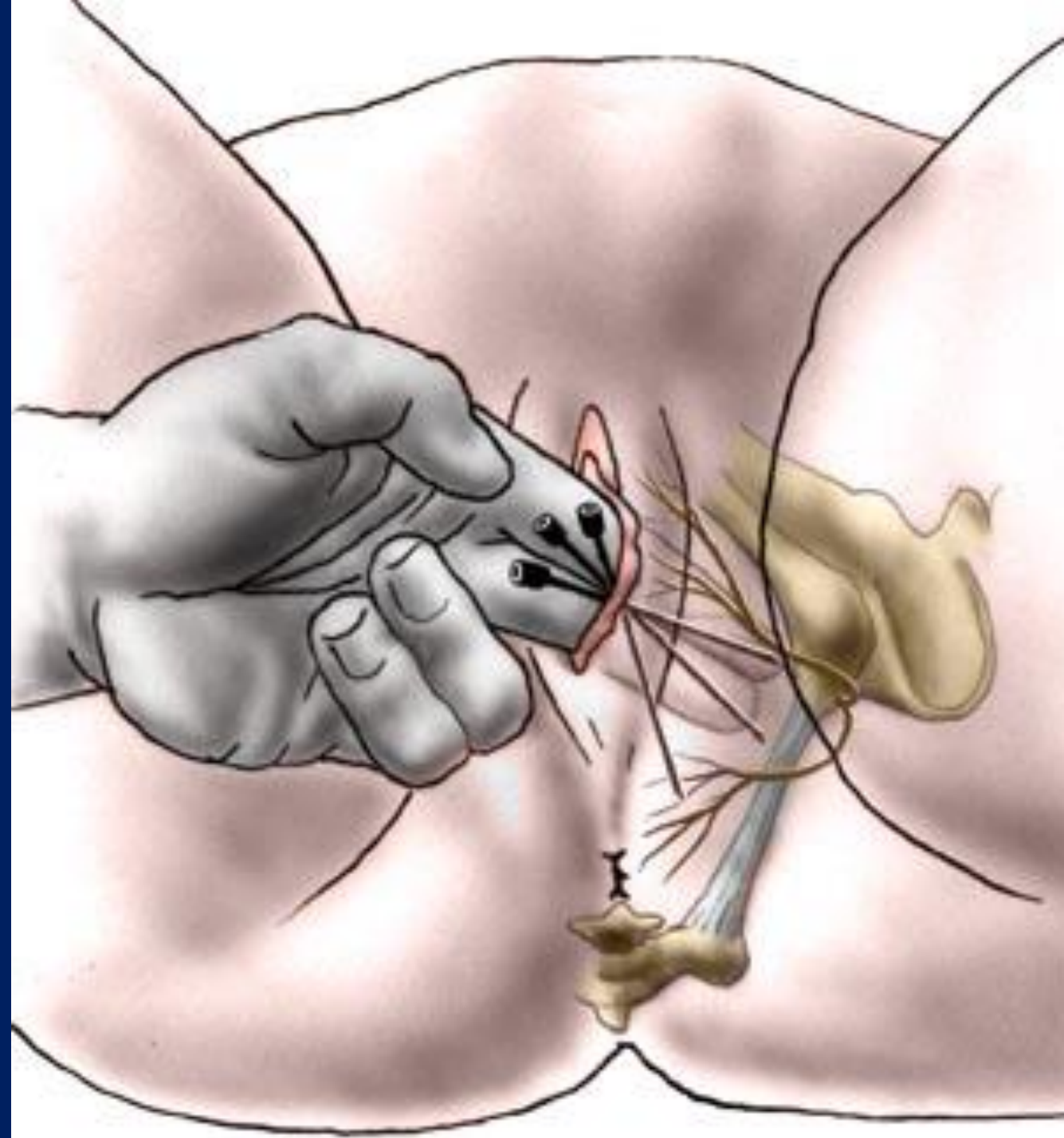
Perineal infiltration

- with local anaesthetic solution
- no for labour
- employed prior
- to episiotomy just before delivery of the baby



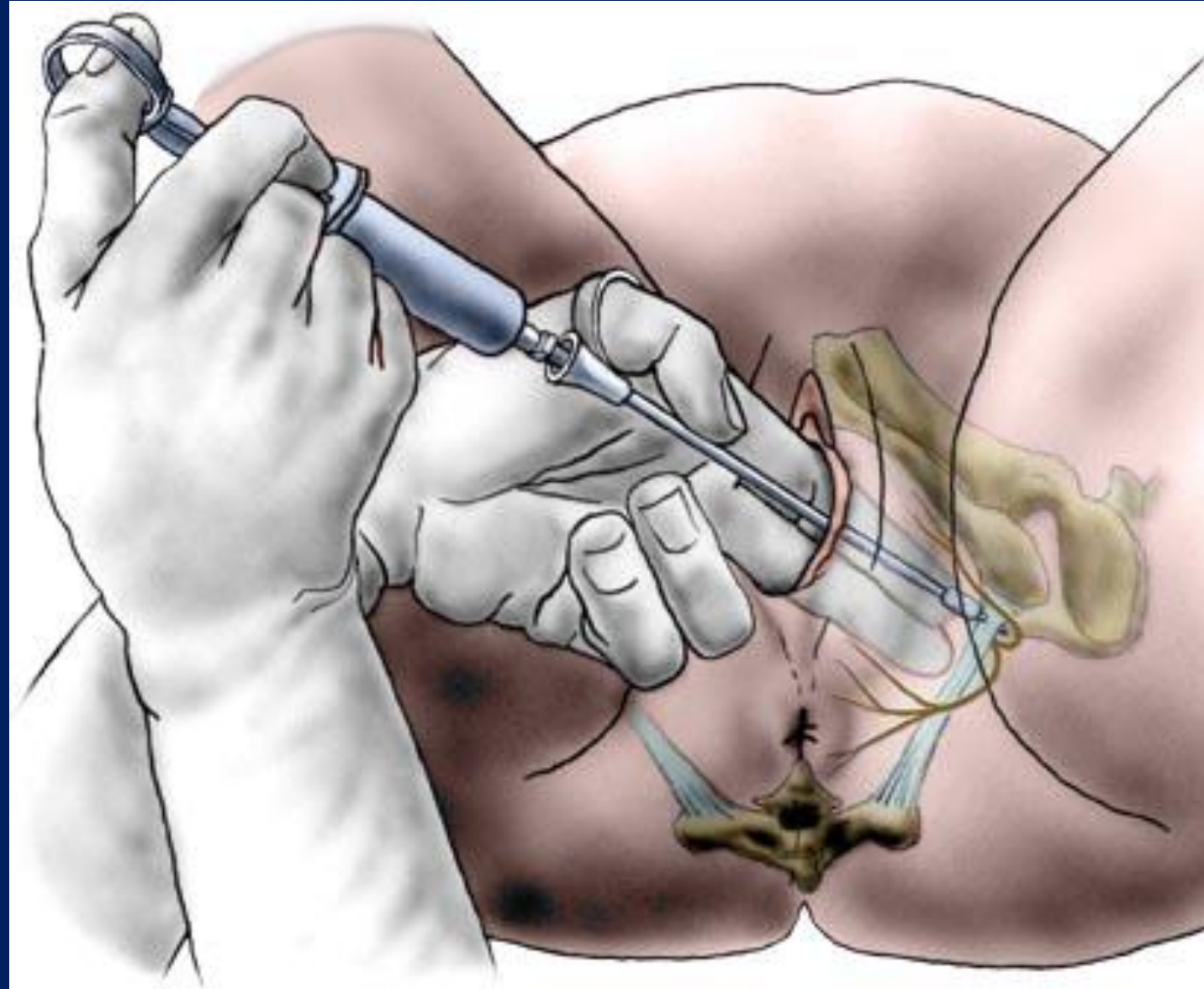
Perineal infiltration

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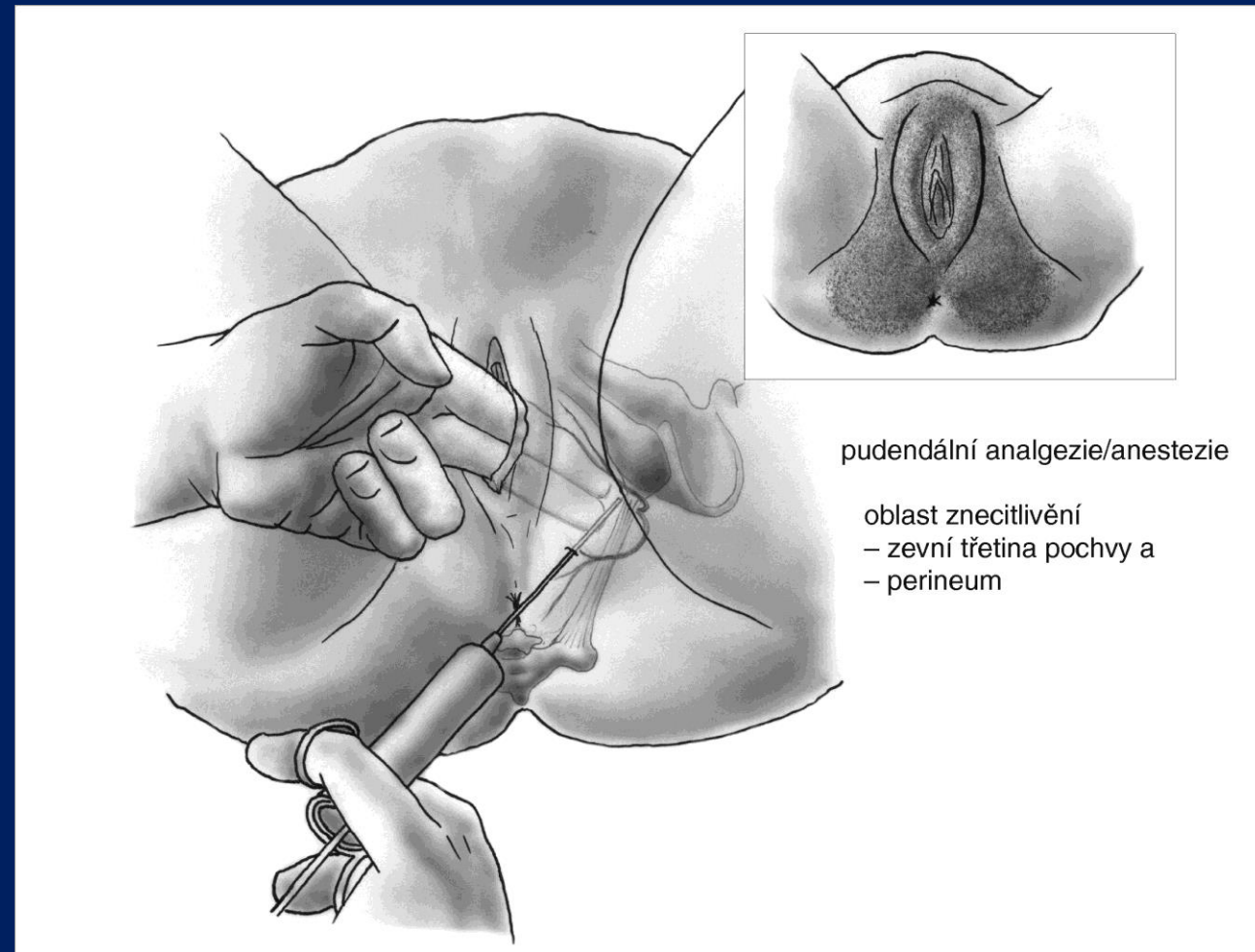
Pudendal block

- simple, safe
- performed by the obstetrician/midw.



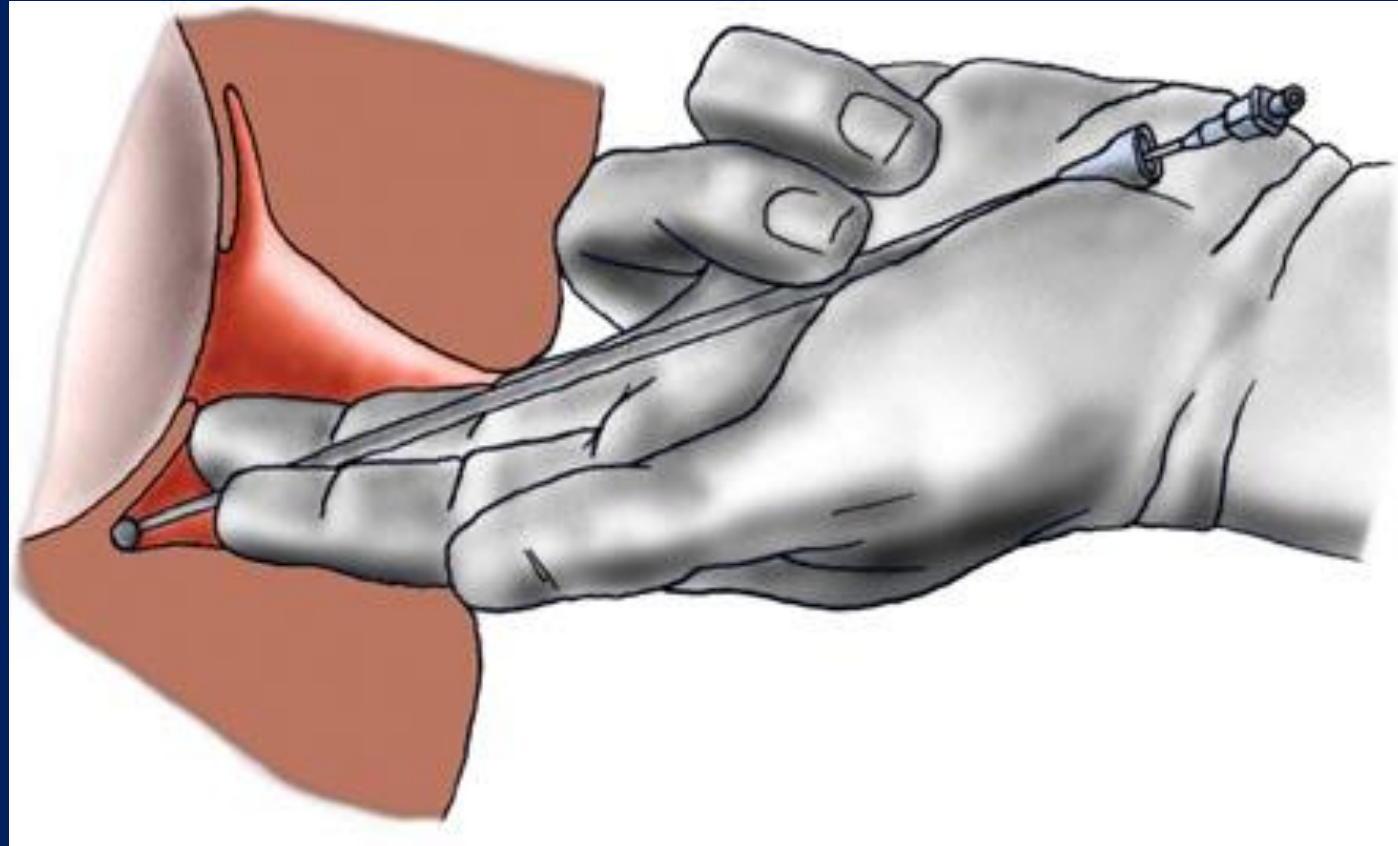
Pudendal block

- analgesia for
forceps delivery
- delivery requires
extensive manipulation



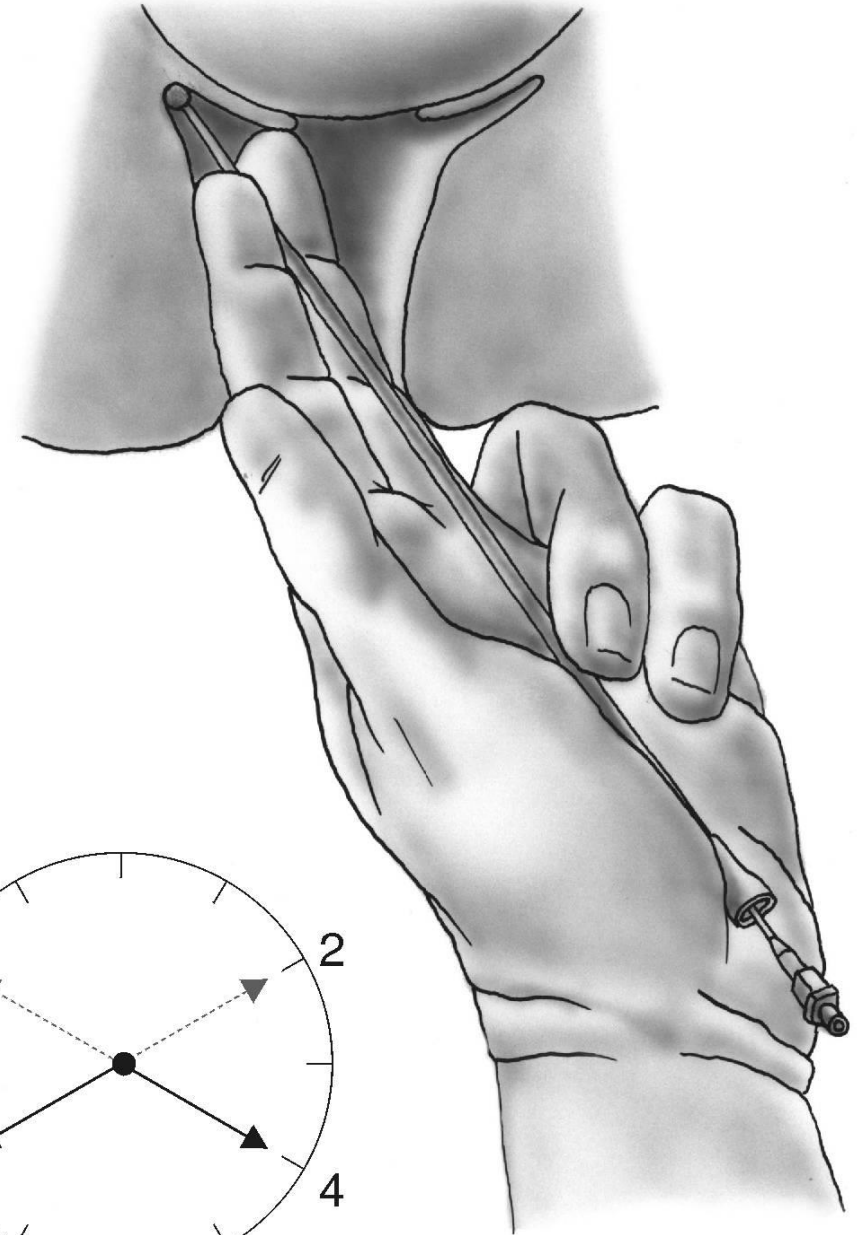
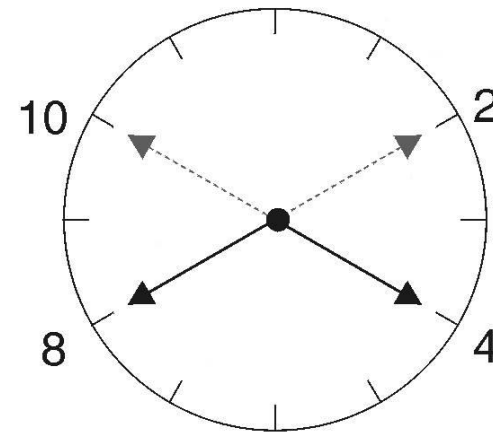
Paracervical block

- analgesia for the pain of uterine contractions
- short acting



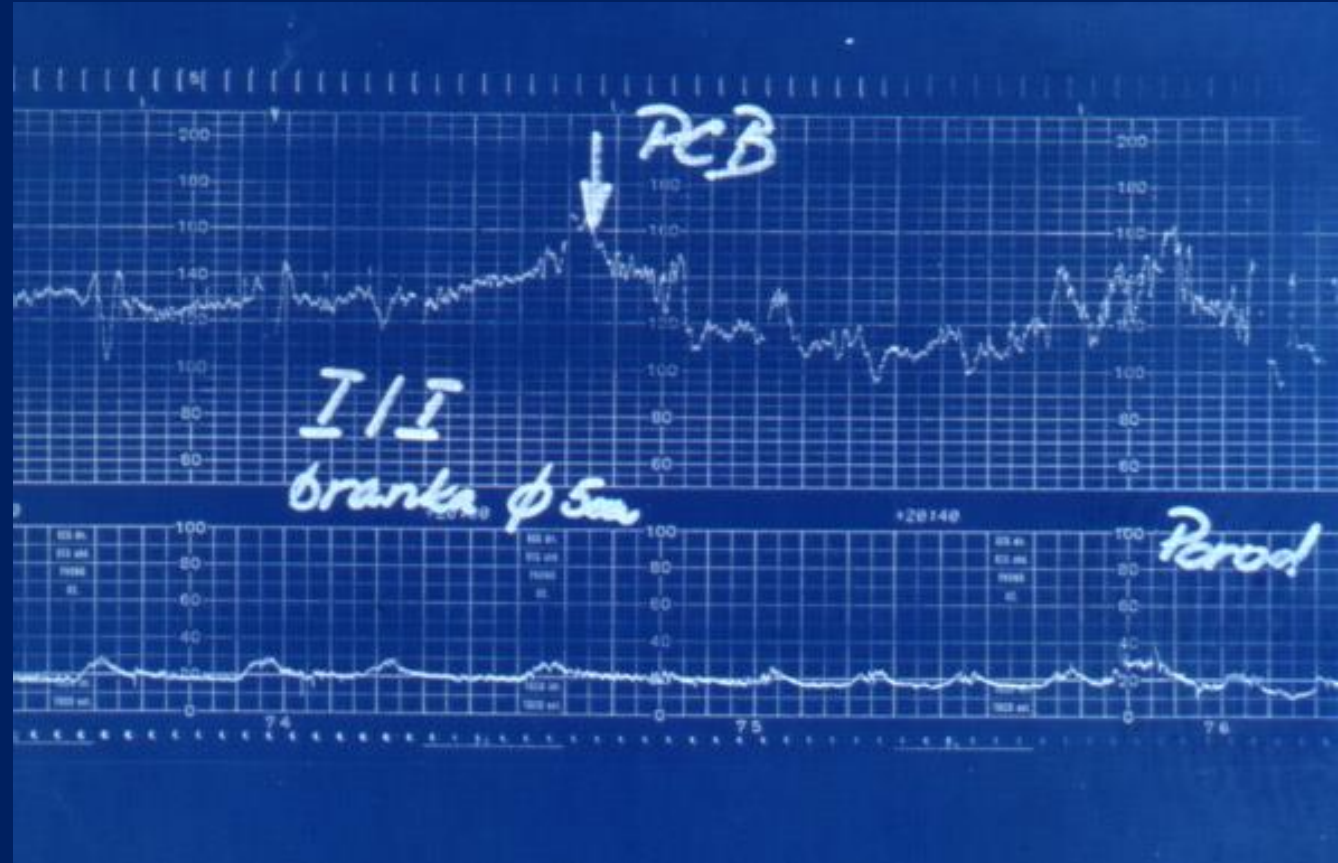
Paracervical block

- usually bupivacain is injected at 8 and 4
- performed by the obstetrician



Paracervical block

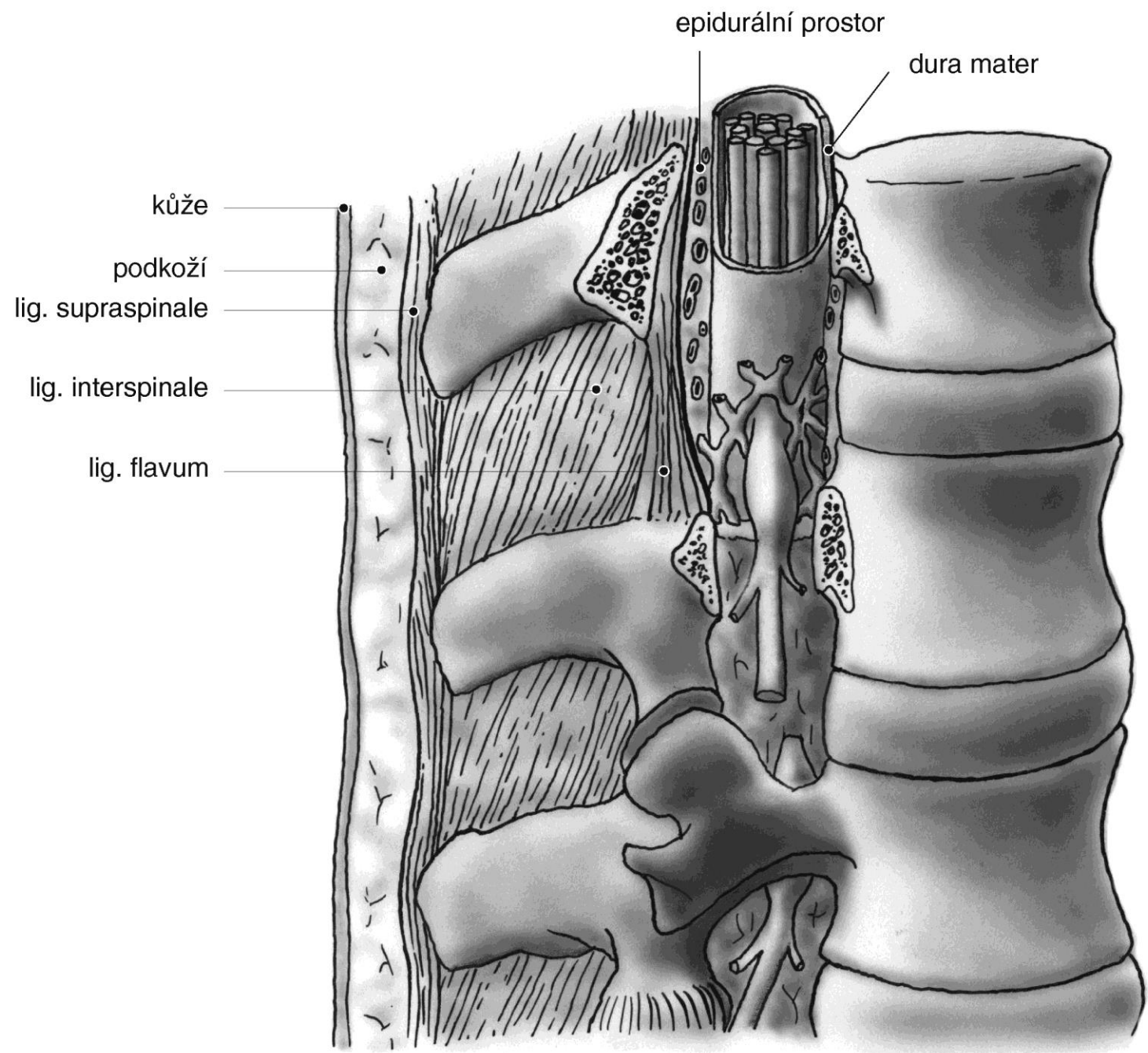
- has fallen out of favour
- the high incidence of fetal bradycardia and neonatal depression



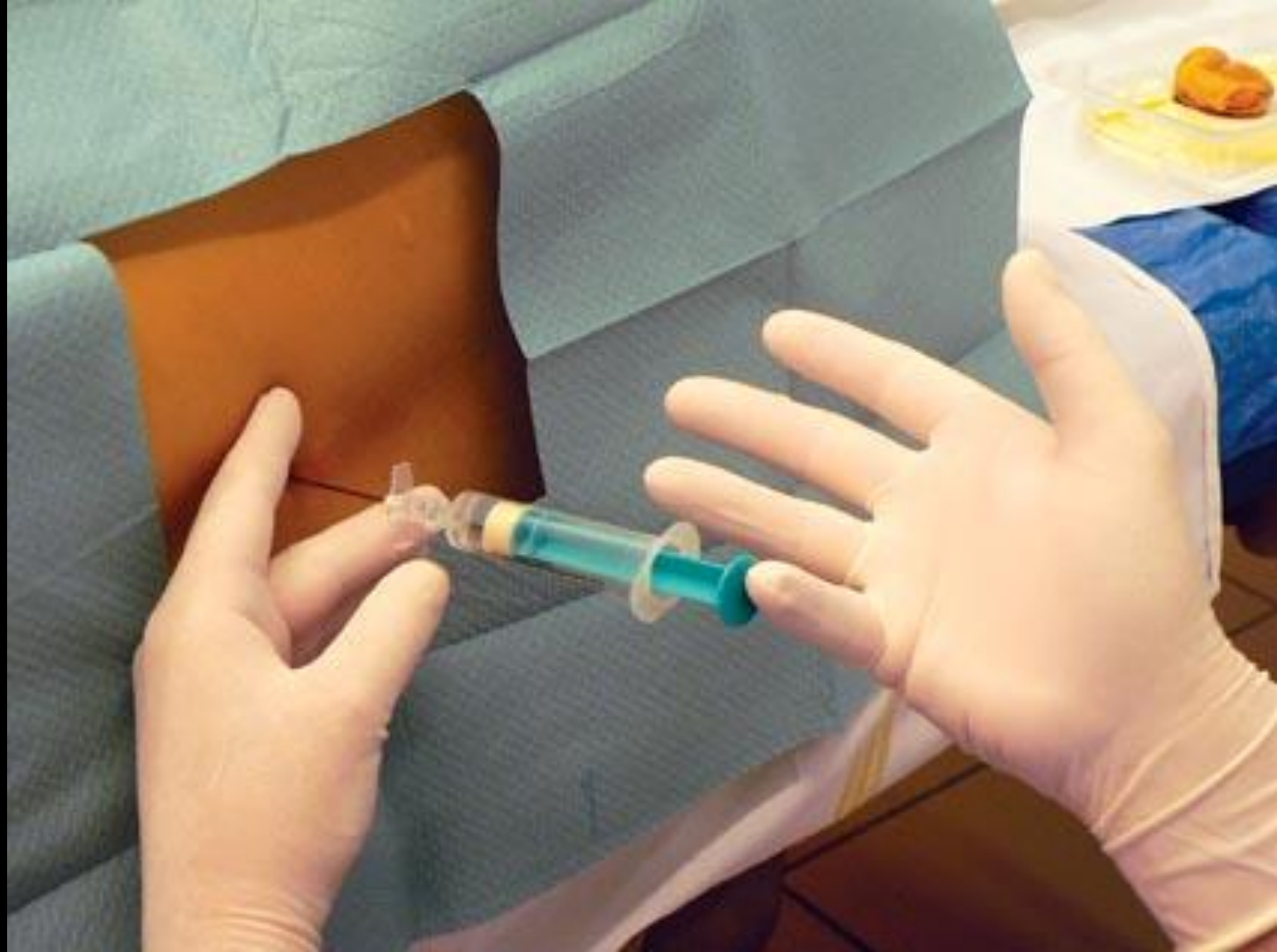
Epidural analgesia in labour

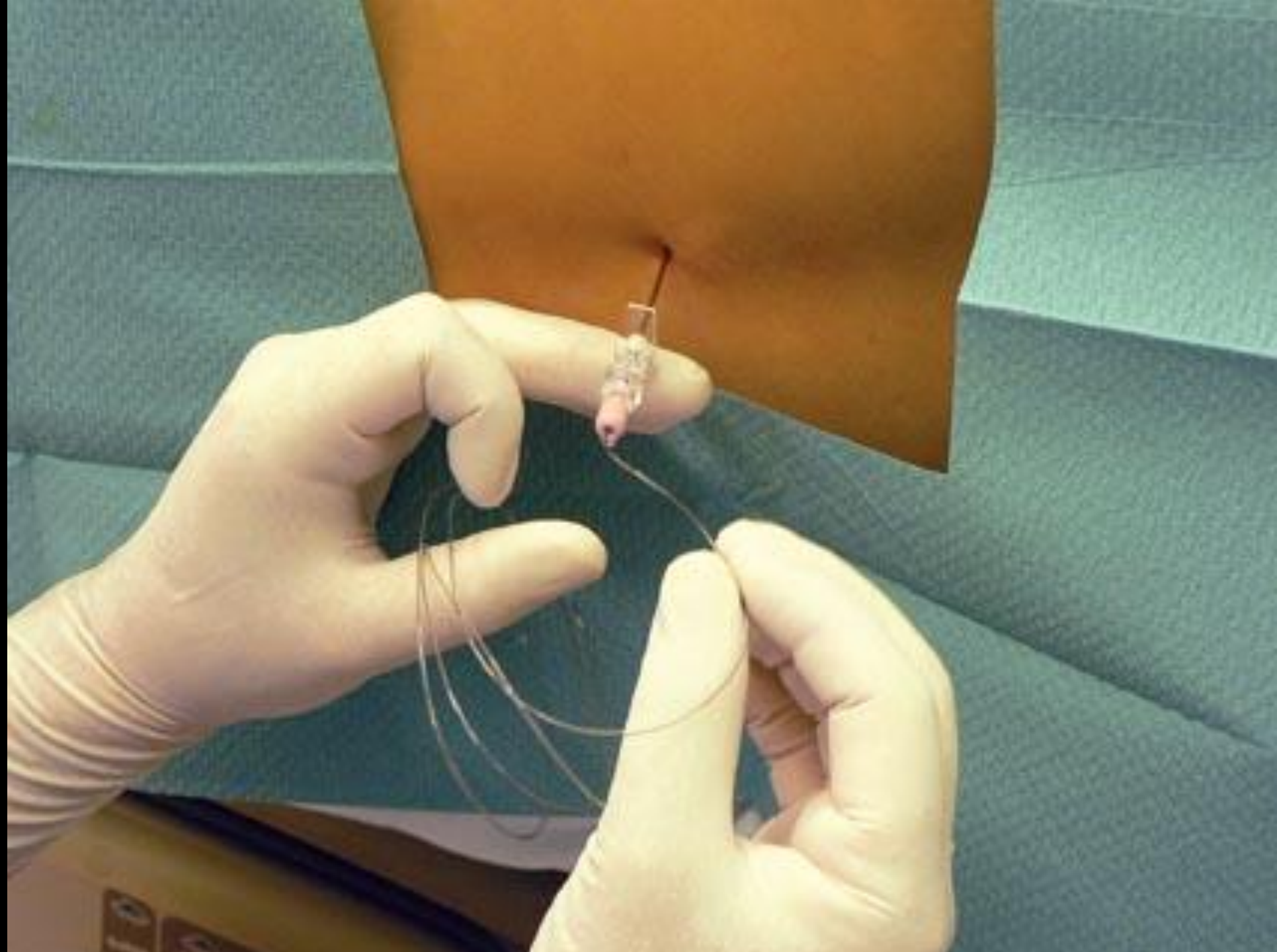


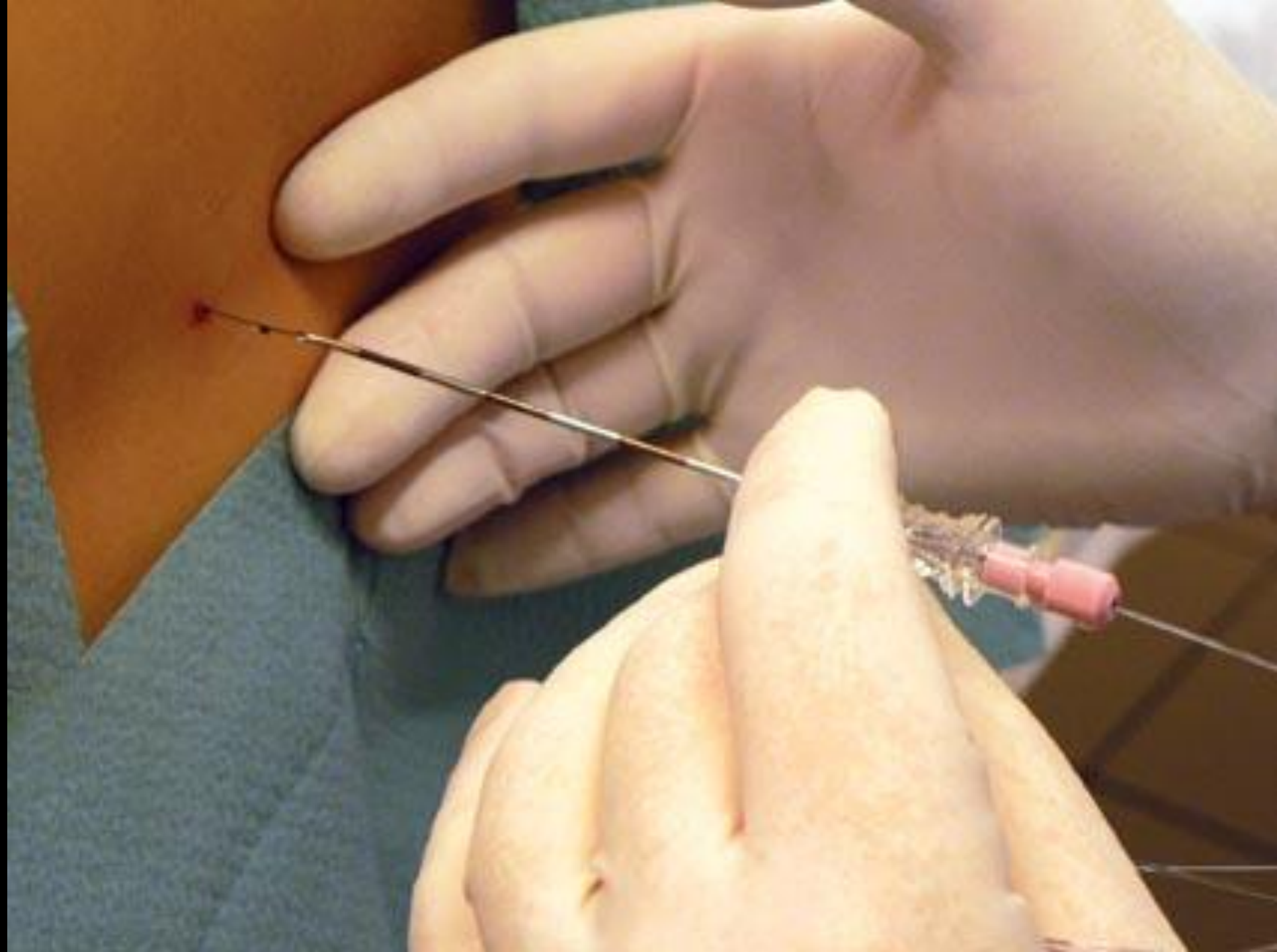
In the first stage of labour required to block T8-L5

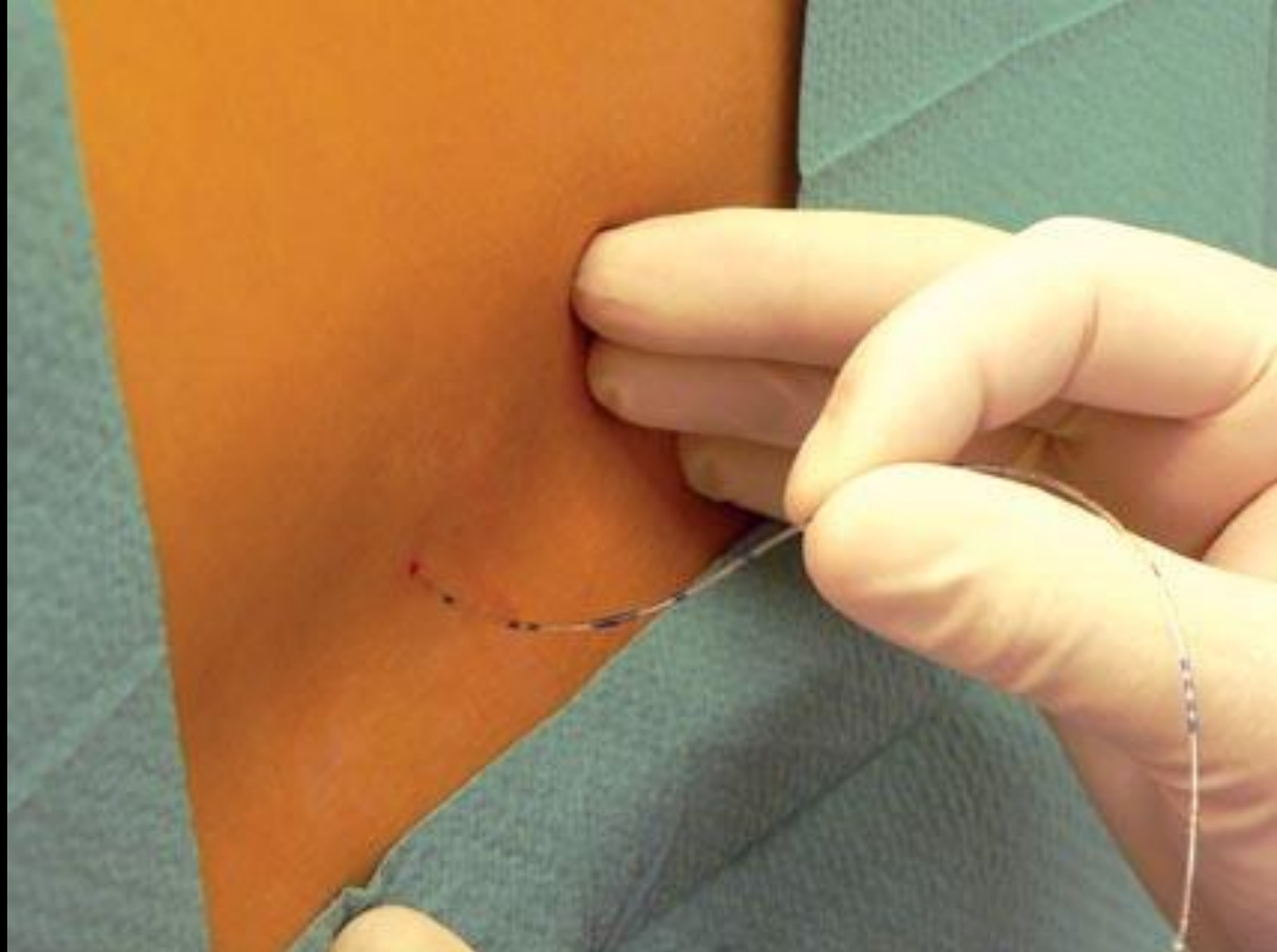








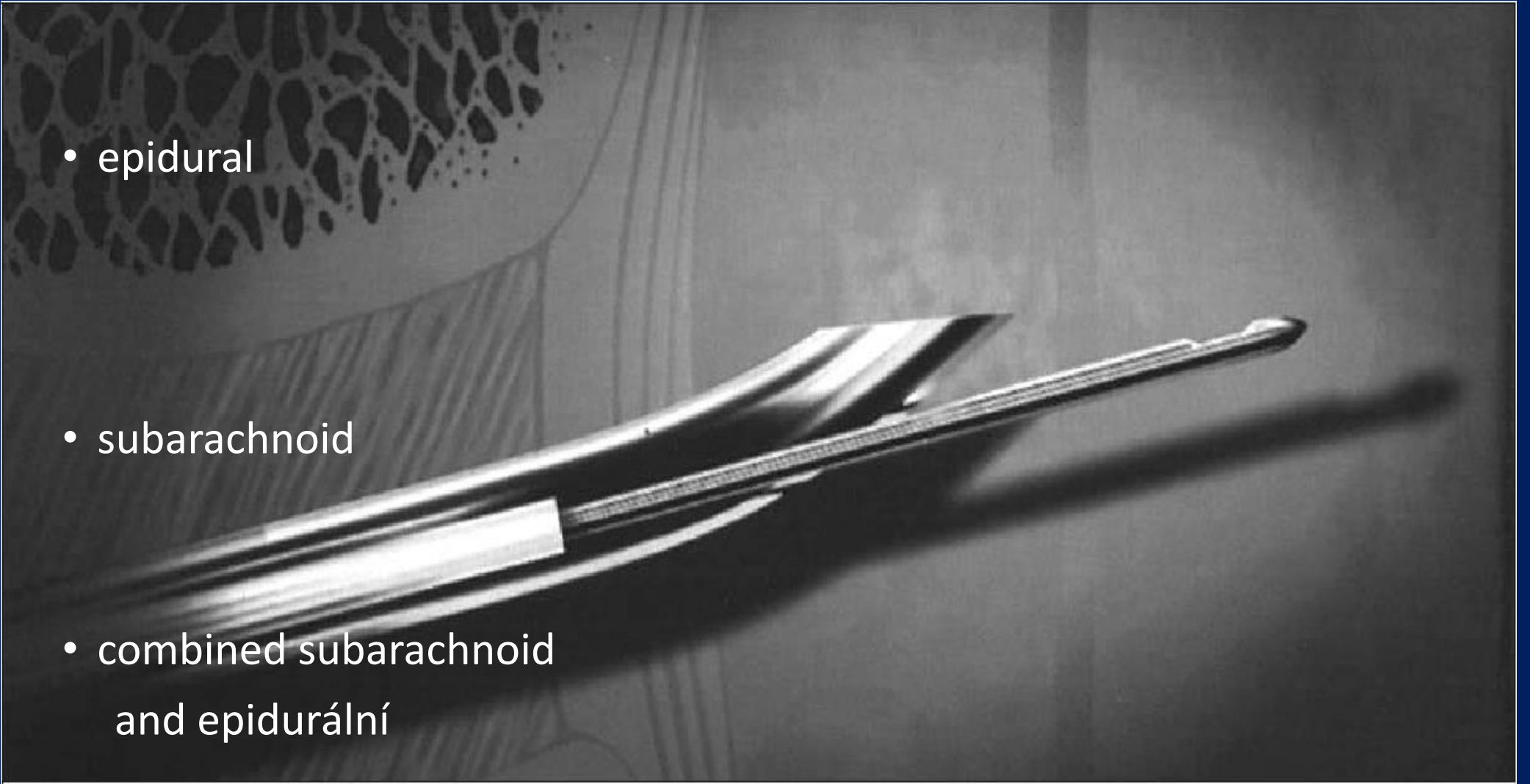






Neuroaxial Analgesia

- epidural
- subarachnoid
- combined subarachnoid
and epidurální





Indications of epidural analgesia

- painful uterine contraction
- request of mother



Indications of epidural analgesia

- cardiovascular disease
- respiratory disease
- eye disease
- epilepsy
- liver disease
- endocrine disease (diabetes mellitus)
- pre-eclampsie
- nicotinism, alcoholism, drug addiction
- anxious pregnancy women
- from labour pain ground-down women



Indications of epidural analgesia

Fetal indications

- preterm labour
- placental insufficiency (IUGR)
- breech presentation
- twins (two vertex)



Indications of epidural analgesia

Other obstetric indications

- induction of labour (prostaglandins)
- cervix dystocia, prolonged labour
- trial of labour, SC ? (regional analgesia switch-over regional anaesthesia for SC)
- termination of pregnancy in II. or III. trimester
- dead fetus



Indications of epidural analgesia

- anaesthesia for a forceps delivery or vacuum extraction
- caesarian section



Contraindications of epidural analgesia

Epidural blockade should not be attempted in the following situations:

- skin infection over the likely site of spinal needle insertion
- pre-existing bleeding diathesis or anticoagulation: haemorrhage may put pressure on the cord
- skeletal deformity or ossification of spine



Advantages of epidural analgesia

- it is very effective, although there is a 5% failure rate
- it provides enough analgesia for an instrumental delivery, and can be used for operative delivery
- it is beneficial for the compromised fetus, eg in a breech delivery
- it has a good safety



Disadvantages of epidural analgesia

- accidental dural puncture: can cause severe headaches

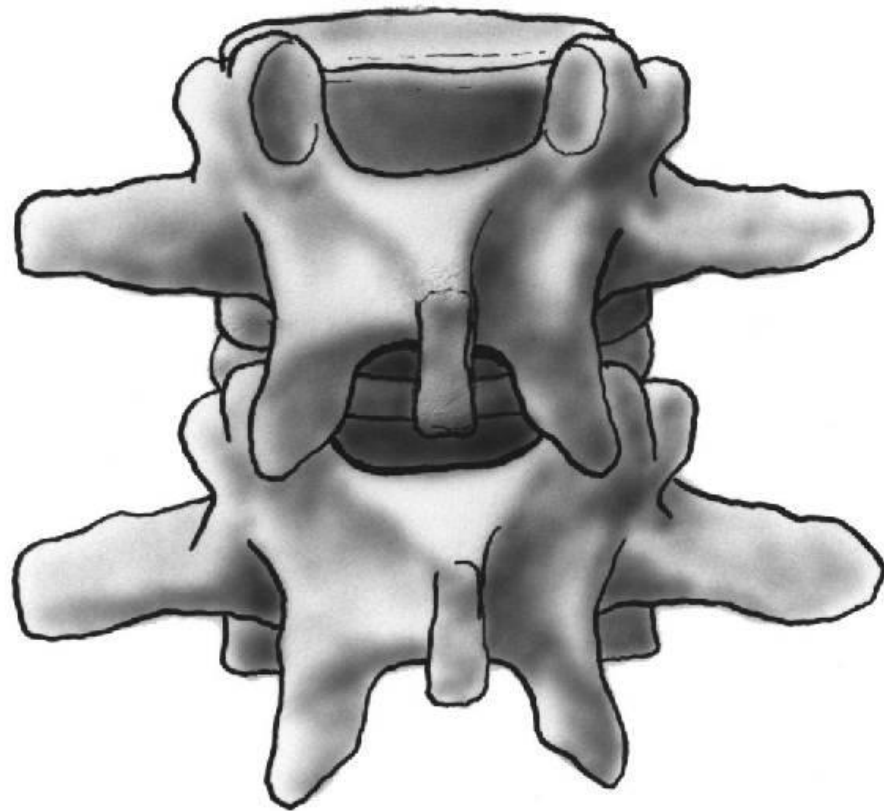


Contraindications of epidural analgesia

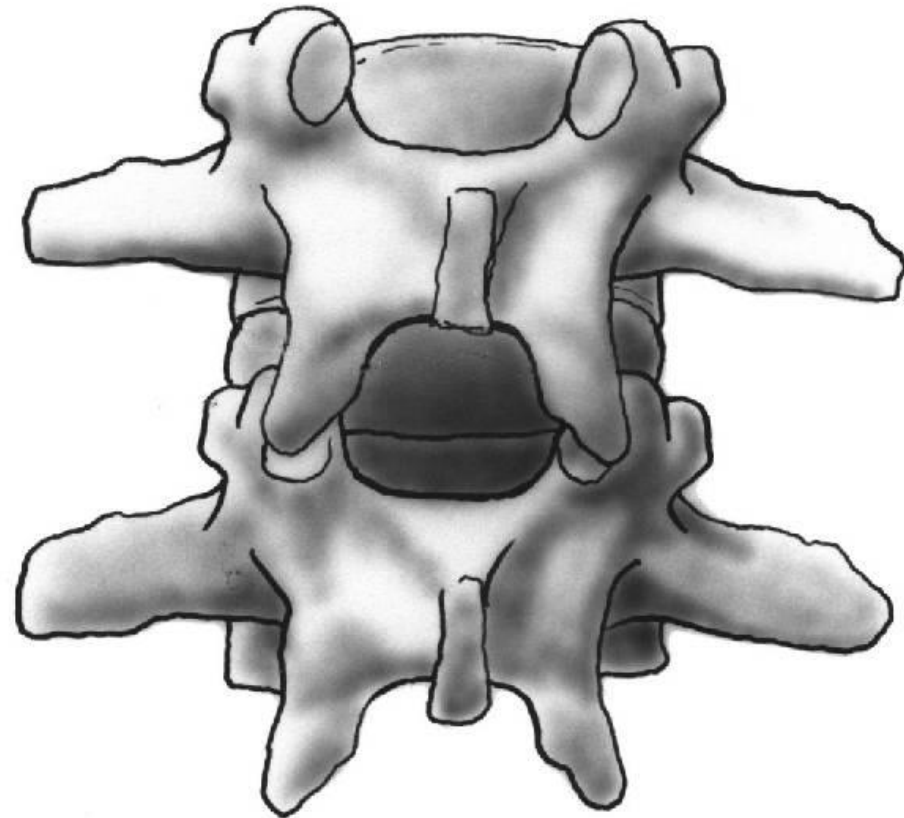
- cardiovascular compromise:
 - shock or hypovolaemia - decreases blood pressure further
 - states of fixed cardiac output, e.g. Aortic stenosis - patient is unable to adapt to stresses of hypotension
- neurological conditions - deterioration postoperatively may be blamed on the anaesthesia







extenze



flexe

Pohled z boku

Pohled zepředu

Pohled zezadu

vertebrae
cervicales
(C₁₋₇)

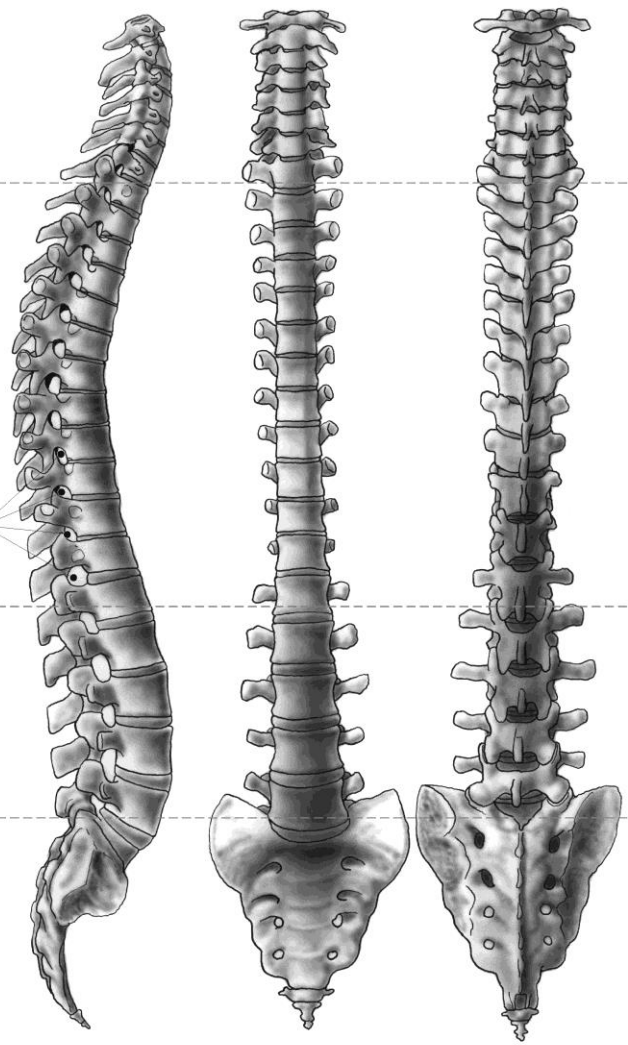
vertebrae
thoracicae
(Th₁₋₁₂)

foramina
intervertebralia

vertebrae
lumbales
(L₁₋₅)

os sacrum
(S₁₋₅)

os coccygis



Volume 51, No. 4

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THE AMERICAN SOCIETY OF ANESTHESIOLOGISTS, INC.

Anesthesiology

Editorial Views

Anesthesiology
51:285-287, 1979

Cardiac Arrest Following Regional Anesthesia with Etidocaine or Bupivacaine

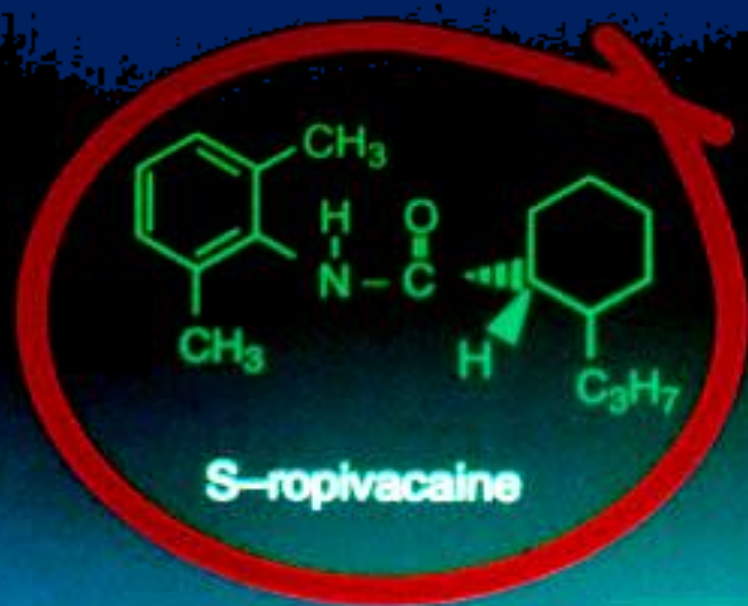
ANESTHESIOLOGISTS have generally believed that cardiac arrest following injection of clinical doses of local anesthetics could be prevented by prompt oxygenation and, if necessary, blood pressure support. However, this may not always be the case in susceptible individuals who have been given inadvertent intravascular injections of clinical doses (100-200 mg) of potent, highly lipid soluble and protein-bound amide local anesthetic agents such as etidocaine and bupivacaine.

The report by Prentiss of sudden cardiac arrest

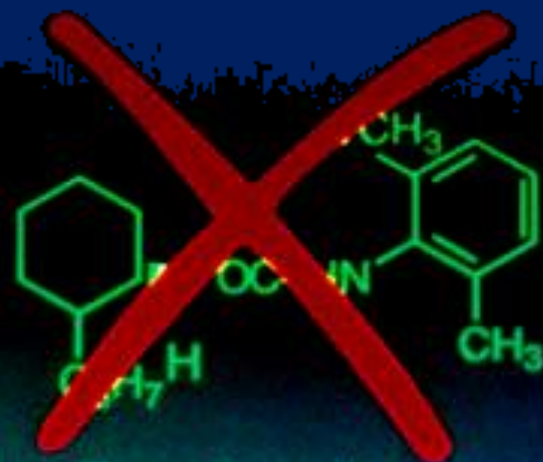
ml. Hodgkinson³ reported ventricular tachycardia at cesarean section after an epidural injection of bupivacaine, 0.75 per cent, 2 ml, and 10 ml 5 min later. There was an immediate onset of severe convulsions. Endotracheal intubation was performed after administration of succinylcholine, 100 mg, and the patient ventilated with pure oxygen. Ventricular tachycardia developed approximately 3 min after the onset of seizures, which responded to DC electric shock. Cardiac resuscitation was rapid in the latter two cases.

The other three cases occurred at: 1) Stanford

Ropivacaine is a pure S-enantiomer



S-ropivacaine



R-ropivacaine

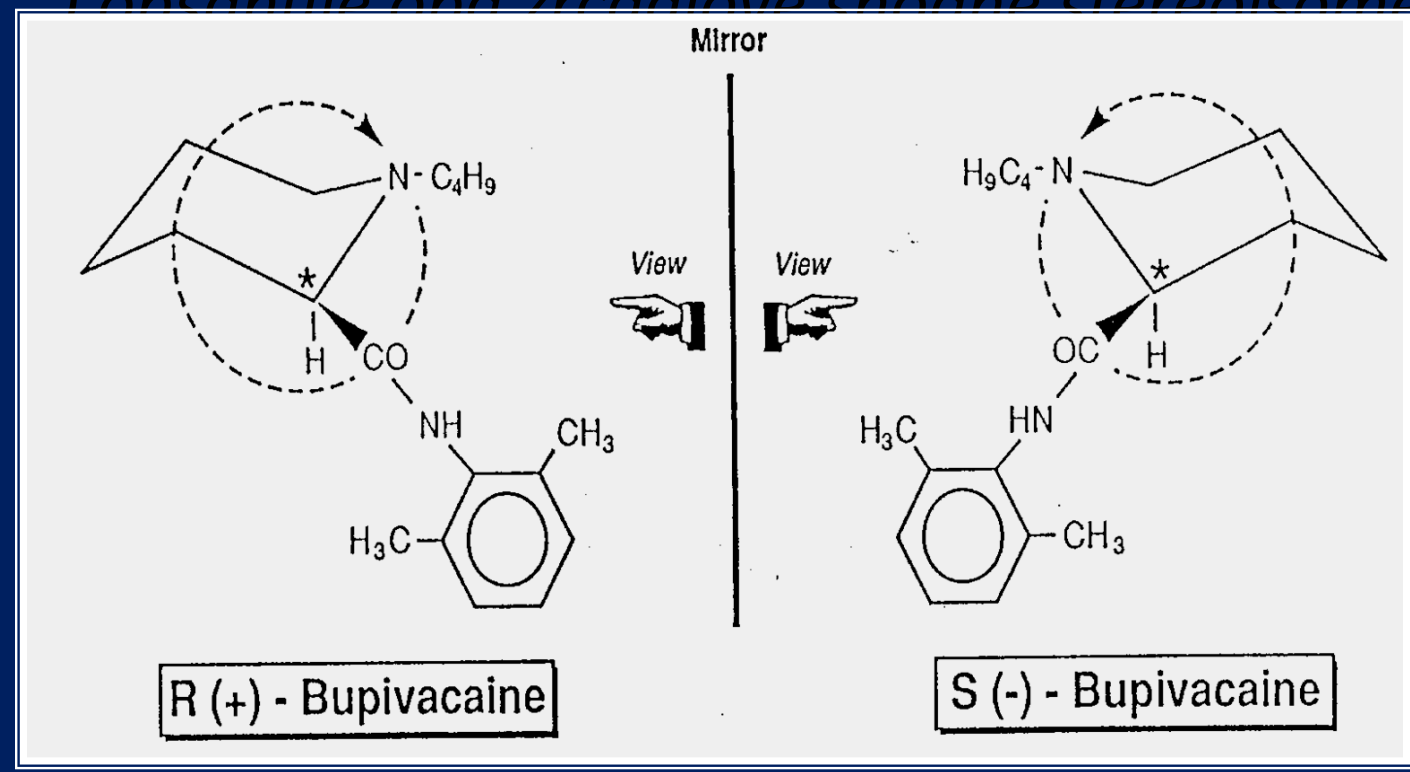
ROPIVACAINE

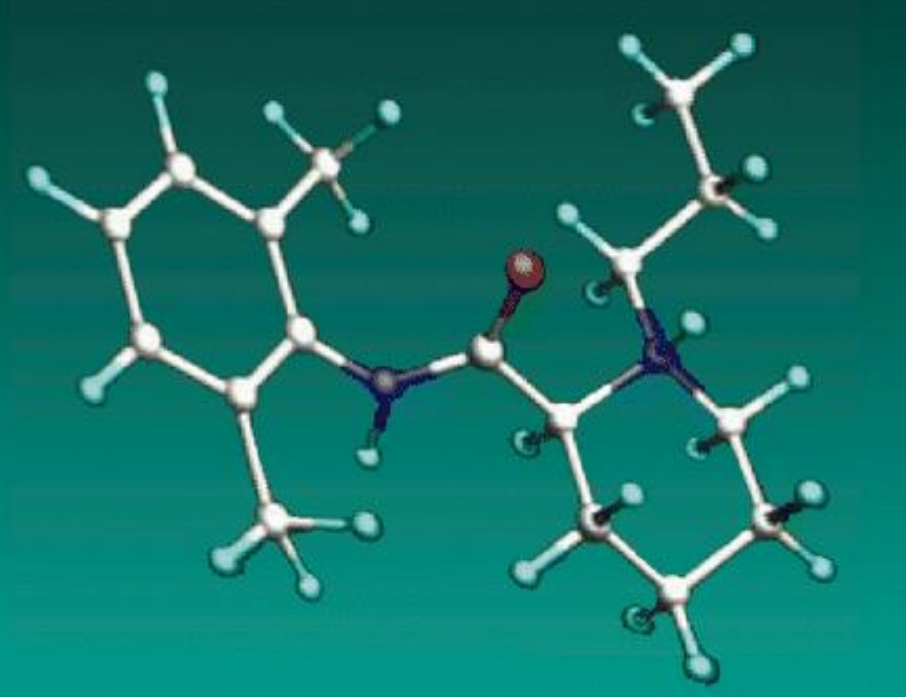
Physico-chemical properties

CHIROCAINE[®]

LEVOBUPIVACAINUM HCL

obsahuje dva zrcadlově chodné stereoisomery





Both are an amide-types local anaesthetic agent

Less risk of cardiotoxicity vs bupivacaine: --significantly less depression of cardiac conductivity (less QRS widening)

CNS tolerance: faster recovery from CNS symptoms in IV toxicity studies vs bupivacaine

Mobil epidural blockade



