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anasthesia

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Obstetrics analgesia and  
anesthesia

There is a social and cultural dimension to the provision and uptake of analgesia in labour. Some women and their carers believe that there is an advantage in avoiding analgesia, whereas other women will use all methods on offer to limit their pain. Professionals who are knowledgeable about labour and the available options for pain relief should give tailored advice according to the needs and priorities of the individual woman.

The method of pain relief is to some extent dependent on the previous obstetric record of the woman, the course of labour and also the anticipated duration of labour. Just as one woman's labour can be made into an unhappy experience by unnecessary analgesia, pain relief that is inadequate or offered too late can ruin another's. Although the final decision rests with the woman, there are certain circumstances in which particular forms of analgesia are contraindicated and should not be offered.

# The ideal analgesic technique in labour should:

- 1 .Provide rapid, effective and safe pain relief for all stages.
- 2 .Not compromise maternal physiology or normal activity.
- 3 .Not compromise fetal vital physiology or well-being.
- 4 .Not hamper the normal processes of labour.

# Principal anaesthetic risk factors

- Patient refusal of anaesthetic procedures
- Previous complications or adverse reactions to anaesthesia
- Proven sensitivity or allergy to anaesthetic drugs
- Severe medical disorders
- Anticoagulant therapy or risk of coagulopathy
- Thrombocytopenia
- Airway abnormalities
- Obesity
- Spinal abnormalities or previous spinal surgery
- Intervertebral disc prolapse
- Neurological disease
- (Some) complex obstetric and/or fetal situations

# Non-pharmacological methods

One-to-one care in labour from a midwife alongside a supportive husband has been shown to reduce the need for analgesia. Relaxation and breathing exercises may help the woman to manage her pain. Prolonged hyperventilation can make the woman dizzy and can cause alkalosis. Homeopathy, acupuncture and hypnosis are sometimes employed, but their use has not been associated with a significant reduction in pain scores or with a reduced need for conventional methods of analgesia.

Relaxation in warm water during the first stage of labour often leads to a sense of wellbeing and allows women to cope much better with pain. The temperature of the water should not exceed 37.5°C. Transcutaneous electrical nerve stimulation (TENS) works on the principle of blocking pain fibers in the posterior ganglia of the spinal cord by stimulation of small afferent fibers. It may be of use in the latent phase of labour and is often used by women at home. It has been shown to be ineffective in reducing pain scores or the need for other forms of analgesia in established labour. It does not have any adverse effects, but is often disappointing.

# Pharmacological methods

Opiates, such as pethidine and diamorphine, are still used in most obstetric units and indeed can be administered by midwives without the involvement of medical staff. This may be one of the reasons for their popularity. They should be available in all birth settings but they provide only limited pain relief during labour and furthermore may have significant side-effects.



# Side-effects of opioid analgesia

1. Nausea and vomiting (they should always been given with an antiemetic).
2. Maternal drowsiness and sedation.
3. Delayed gastric emptying (increasing the risks of general anaesthesia).
4. Short-term respiratory depression of the baby.
5. Possible interference with breastfeeding.

Opiates tend to be given as intramuscular injections; however, an alternative is a subcutaneous or intravenous infusion by a patient-controlled analgesic device (PCA). This allows the woman, by pressing a dispenser button, to determine the level of analgesia that she requires. If a very short-acting opiate is used, the opiate doses can be timed with the contractions. This method of pain relief is particularly popular among women who cannot have an epidural and find non pharmacological options insufficient.

# Inhalational anaesthesia

Nitrous oxide (NO) in the form of Entonox<sup>®</sup> (an equal mixture of NO and oxygen) is available on most labour wards. It has a quick onset, a short duration of effect and is more effective than pethidine. It may cause light-headedness and nausea. It is not suitable for prolonged use from early labour because hyperventilation may result in hypocapnoea, dizziness and, rarely, tetany and fetal hypoxia. It is most suitable later on in labour or while awaiting epidural analgesia.

# Epidural anaesthesia

Epidural (extradural) analgesia is the most reliable means of providing effective analgesia in labour. Failure to provide an epidural is one of the most frequent causes of upset and disappointment among labouring women. The epidural service must be well organized to be effective, and fortunately resources are now available in most hospital settings so that a significant delay in the placement of an epidural is unusual.

The decision to have an epidural sited should be a combined one between the woman, her midwife, the obstetric team and the anaesthetist. The woman must be informed about the benefits and risks and the final decision in most cases rests with the woman unless there is a definite contraindication. It is important to warn the woman that she may lose sensation and movement in her legs temporarily, and that intravenous access and a more intensive level of maternal and fetal monitoring will be necessary, for example with continuous EFM (the CTG).

The effect of epidural anaesthesia on labour duration and the operative delivery rate has been a controversial issue. The evidence is now clear that epidural anaesthesia does not increase caesarean section rates. However, the second stage is longer and there is a greater chance of instrumental delivery.

In certain clinical situations, an epidural in the second stage of labour may assist a vaginal delivery by relaxing the woman and allowing time for the head to descend and rotate. The main indication is for effective pain relief. There are other maternal and fetal conditions for which epidural analgesia would be advantageous in labour.

An epidural will limit mobility and for this reason, it is not ideal for women in early labour. However, women in severe pain, even in the latent phase of labour, should not be denied regional anaesthesia. Neither is advanced cervical dilatation necessarily a contraindication to an epidural. It is more important to assess the rate of progress, the anticipated length of time to delivery and the type of delivery expected.

# Indications and contraindications for epidural anaesthesia

## Indications:

- Prolonged labour/oxytocin augmentation.
- Maternal hypertensive disorders.
- Multiple pregnancy.
- Selected maternal medical conditions.
- A high risk of operative intervention.

## Contraindications:

- Coagulation disorders (e.g. low platelet count).
- Local or systemic sepsis.
- Hypovolaemia.
- Logistical: insufficient numbers of trained staff (anaesthetic and midwifery).

# Complications of epidural anaesthesia

Accidental dural puncture during the search for the epidural space should occur in no more than 1% of cases. If the subarachnoid space is accidentally reached with an epidural needle, this may allow leakage of cerebrospinal fluid (CSF) and results in a 'spinal headache'. This is characteristically experienced on the top of the head and is relieved by lying flat and exacerbated by sitting upright. If the headache is severe or persistent, a blood patch may be necessary. This involves injecting a small volume of the woman's blood into the epidural space at the level of the accidental dural puncture. The resulting blood clot is thought to block off the leak of CSF.



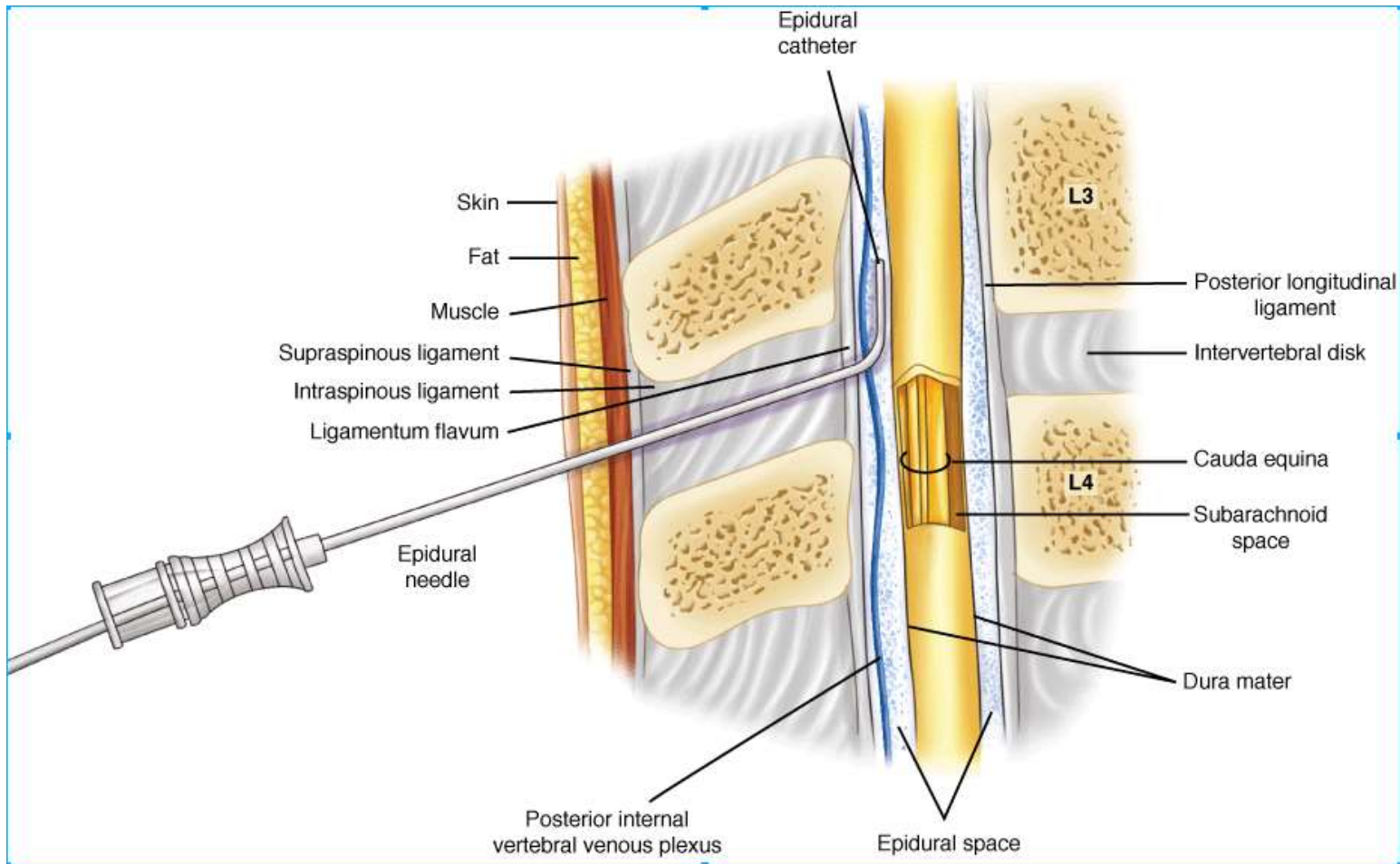
Bladder dysfunction can occur if the bladder is allowed to overfill because the woman is unaware of the need to micturate, particularly after the birth while the spinal or epidural is wearing off. Overdistension of the detrusor muscle of the bladder can permanently damage it and leave long-term voiding problems. To avoid this, catheterization of the bladder should be carried out during labour if the woman does not void significant volumes of urine spontaneously.

Hypotension can occur with epidural anaesthesia, although it is more common with spinal anaesthesia. It can usually be treated with fluid boluses, but may need vasopressors. Occasionally, maternal hypotension will lead to fetal compromise.

Accidental total spinal anaesthesia (injection of epidural doses of local anaesthetic into the subarachnoid space) causes severe hypotension, respiratory failure, unconsciousness and death if not recognized and treated immediately. The mother requires intubation, ventilation and circulatory support. Hypotension must be treated with intravenous fluids, vasopressors and positioning of the woman onto her left side.

In some cases, urgent delivery of the baby may be required to overcome aorto-caval compression and so permit maternal resuscitation. Spinal haematomata and neurological complications are rare, and are usually associated with other factors such as bleeding disorders. Drug toxicity can occur with accidental placement of a catheter within a blood vessel. This is normally noticed by aspiration prior to injection. Short-term respiratory depression of the baby is possible because all modern epidural solutions contain opioids, which reach the maternal circulation and may cross the placenta.

# epidural anaesthesia

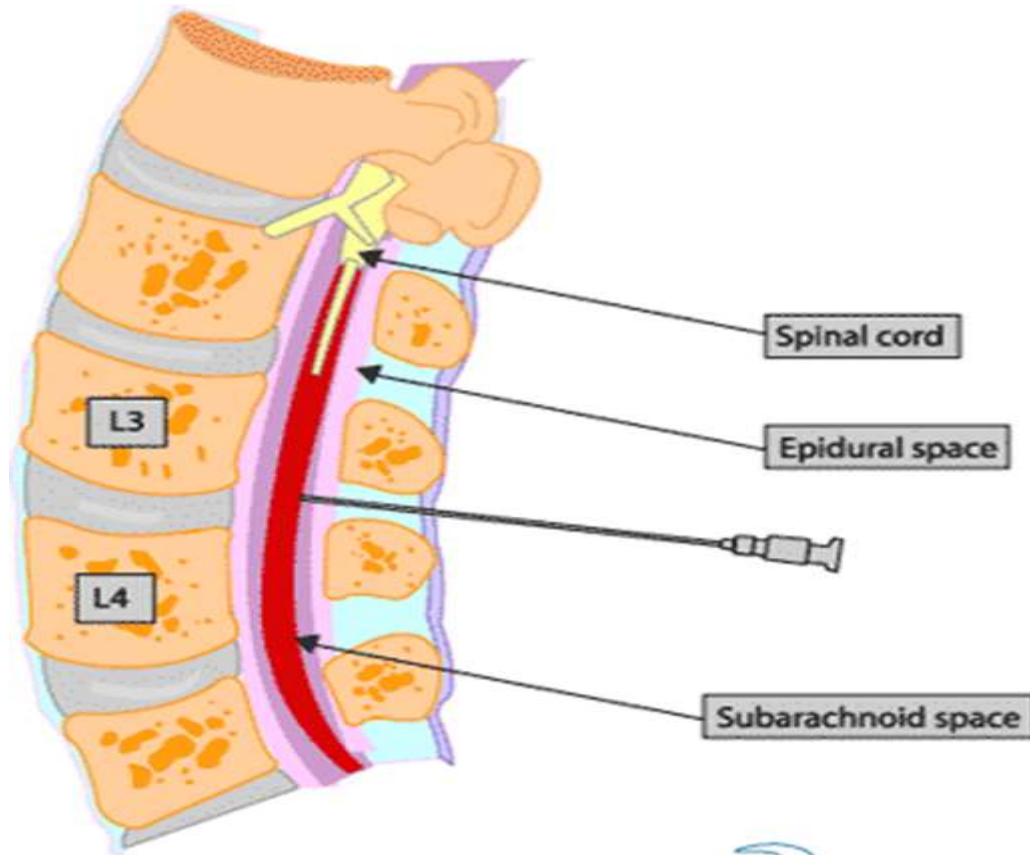


# Spinal anaesthesia

A spinal block is considered more effective than that obtained by an epidural, and is of faster onset. A fine-gauge atraumatic spinal needle is passed through the epidural space, through the dura and into the subarachnoid space, which contains the CSF. A small volume of local anaesthetic is injected, after which the spinal needle is withdrawn. This may be used as anaesthesia for caesarean sections, trial of instrumental deliveries (in theater), manual removal of retained placenta and the repair of difficult perineal and vaginal tears. Spinals are not used for routine analgesia in labour.

Combined spinal–epidural (CSE) anaesthesia has gained in popularity. This technique has the advantage of producing a rapid onset of pain relief and the provision of prolonged analgesia. Because the initiating spinal dose is relatively low, this is a viable option for pain relief in labour.

# Spinal anaesthesia



# General Anesthesia

The increased safety of regional analgesia has increased the relative risk of general anesthesia. The case-fatality rate of general anesthesia for cesarean delivery is estimated to be approximately 32 per million live births compared with 1.9 per million for regional analgesia.

One common cause of death cited for general anesthesia is failed intubation. This occurs in approximately 1 of every 250 general anesthetics administered to pregnant women—a tenfold higher rate than in nonpregnant patients. The American College of Obstetricians and Gynecologists (2002) has concluded that this relative increase in morbidity and mortality rates suggests that regional analgesia is the preferred method of pain control and should be used unless contraindicated. Trained personnel and specialized equipment—including fiberoptic intubation—are mandatory for the safe use of general anesthesia.

## Patient Preparation:

Prior to anesthesia induction, several steps should be taken to help minimize the risk of complications for the mother and fetus. These include the use of antacids, lateral uterine displacement, and preoxygenation.

## Antacids:

The practice of administering antacids shortly before induction of anesthesia has probably done more to decrease mortality rates from general anesthesia than any other single practice. It is recommended to use a nonparticulate antacid, an H<sub>2</sub>-receptor antagonist, or metoclopramide.

## Uterine Displacement:

Supine Hypotension, the uterus may compress the inferior vena cava and aorta when the mother is supine. With lateral uterine displacement, the duration of general anesthesia has less effect on neonatal condition than when the woman remains supine.

## Preoxygenation:

Because functional reserve lung capacity is reduced, pregnant women become hypoxemic more rapidly during periods of apnea than do nonpregnant patients. Obesity exacerbates this tendency. This is accomplished by administering 100-percent oxygen via face mask for 2 to 3 minutes prior to anesthesia induction.

Good Luck