Anaesthesia and having a baby

Dr P Millns FRCA and Dr K Eagland FRCA, Birmingham Womens Hospital

Introduction

The aim of this section of the site is to offer some information about pain relief in childbirth, anaesthesia for Caesarean section and the role of the anaesthetist during this time. The information is set out in easily digestible format and addresses common queries and concerns raised by mothers-to-be. Basic pros and cons of each available method are considered so that prospective mothers can reflect on the options open to them before the big day! The opinions stated are those of the authors and they recognise that local practices in a particular hospital may vary across the country. It is advisable, therefore, for mothers-to-be to check on local arrangements, by discussion with their anaesthetist, midwife, or obstetrician, as indicated.

- **Pain relief in labour**
  - **General**
  - **TENS**
  - **Entonox**
  - **Opiate drugs**
  - **Epidural analgesia**
- **Anaesthesia for Caesarean Section**
- **Glossary**

Pain relief in labour

General

It seems sensible, initially, to define a few terms, so that we may understand where the pain of labour comes from:

Labour may start in a variety of ways: it may be heralded by the waters breaking; the mother may '*have a show*' or the abdominal tightenings felt intermittently during the latter part of pregnancy may gradually increase in frequency and strength so that they become regular and painful. As this *first stage* of labour proceeds, the uterine contractions lead to *dilation* of the *cervix*. Ultimately, the cervix reaches full dilation at ten centimetres and the *second stage* of labour, with delivery of the baby is achieved. The placenta is delivered in the *third stage* of labour. The time course is extremely variable, as is the amount and site of pain experienced!!

In the early stages of labour, backache is not uncommon. This may be maintained as the labour progresses but often the increasing strength of contractions leads to more pain being felt in the front of the abdomen, frequently centred just above the pubic bone as the cervix dilates. Towards the latter part of labour 'pressure discomfort' may be felt in the *perineum*.

So what to do about the pain? For many women, the knowledge of what is occurring, the focus on pain as a 'positive' experience and the support of a partner and midwife is all that is required. Techniques, such as breathing and relaxation exercises learnt in the antenatal period may help. However, for many this is not enough and some assistance is required! There are several methods available for the relief of pain– for some mothers, only one may be necessary; others may try several types! We will consider them in order of increasing complexity.

Early on, massaging of the lower back or reclining in a warm bath may help to soothe backache. The use of water may be extended into the hospital where a birthing-pool may be available.

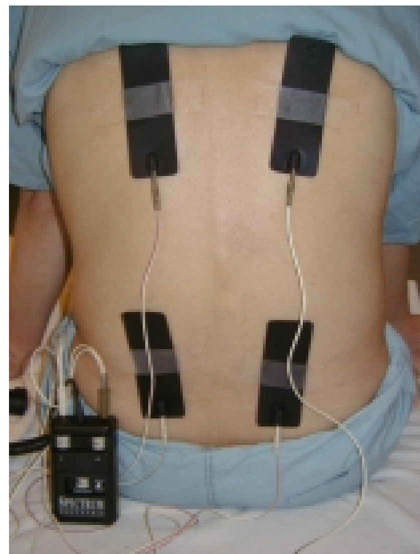
TENS (Transcutaneous Electrical Nerve Stimulation)

TENS may be used with benefit in the early stages of labour, although other methods are often required to supplement it as labour progresses. A TENS machine consists of a small box that contains a battery. Two sets of leads are plugged into the box and adhesive pads are connected to each lead. The four pads are placed on the back – two either side of the spine in the lower back and two below these, at the back of the pelvis. With the machine switched on, small pulses of electrical current are emitted by the device. There are, commonly, two controls on the box- one for varying how fast the pulses of current are given and one for determining the strength of the pulses. Initially, the controls are adjusted so that a tingling sensation is felt under the pads. The effect takes about thirty minutes to build up once the machine is switched on. As labour progresses, the control settings may be advanced as needed. Often, there is a 'boost button' attached, which allows for extra effect during contractions.

Pros The device works by stimulating production of the body's own pain killing substances; as with massage, it also produces benefit by 'distracting' the brain from the painful impulses arising in the same area. It does not, therefore, make the mother feel sleepy or sick. It has no effect on the baby.

Cons Availability of machines is variable. You may be able to borrow one from your hospital or else hire one from national agencies. You do need someone around to put the pads on for you. The machine cannot be used by someone with a cardiac pacemaker or by someone using a bath for pain relief.

A TENS machine with pads and boost button attached.



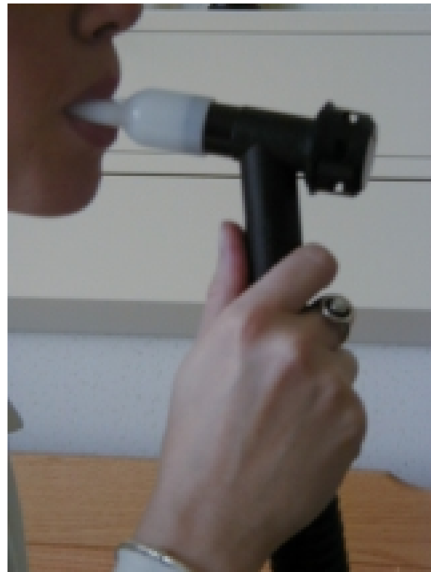
TENS machine pads in position.

Entonox

This is a fifty-fifty mixture of nitrous oxide and oxygen, often known as 'gas and air'. It is kept in portable cylinders, which may be used by a midwife in the community. In hospital it is often delivered from a wall outlet in the delivery room. It is the nitrous oxide that produces pain relief, at brain level. The mother is given a handset to hold, connected to some tubing. There is a small valve on the end of this with either a mouthpiece or facemask attached. The valve allows the mother to breathe in and out without removing the mouthpiece or mask from her face. To be effective, it must be breathed as soon as a contraction starts and right through until the contraction wanes. It starts to produce some benefit after about 30 seconds of breathing, once the levels in the bloodstream are high enough.

Pros It is, probably, the most flexible, quick – acting method available. It may be used at any stage of labour, though is often not enough on its own for a long labour, if needed early on. It is self-administered, which contributes to its safety. Once breathing of the gas is stopped, any residual gas is removed from the body via the lungs quickly. The gas does cross the placenta but is not known to have adverse effect on the baby.

Cons It does make some people feel sick or light-headed and is very drying if breathed for long periods, as it contains no water vapour. If used with an injection method, such as Pethidine, it can increase drowsiness. Although the gas does not smell or taste unpleasant, some find it not to their liking. It does need some practice to use it correctly.



An Entonox handset and mouthpiece.

Opiate drugs

These drugs, such as pethidine, diamorphine and meptazinol, are usually given by a midwife as an injection into a muscle in the thigh. They are absorbed from the muscle into the bloodstream and transported to the brain. There is a gradual build-up of effect over the first hour and a half which then declines over another hour or so. Individuals respond differently to the drugs – some mothers may have good pain relief but become very sleepy; others may notice little pain relief at all. The effect is not predictable. For many, there is an associated sensation of loss of control which may be disappointing. These drugs may cause nausea and vomiting, so are often given with another drug to reduce this side-effect.

The drugs cross the placenta. The baby can be affected therefore, with the biggest effect about two hours after the mother has had the injection. The newborn baby may be sleepy or need an antidote injection to counteract any effects of the drug, especially if he or she is slow to breathe. Some mothers notice a reluctance of the newborn to feed during the first couple of days if they have had pethidine in labour.

On occasion, the drugs may be given via a pump system connected to a drip. The mother controls the amount of drug she receives. This patient-controlled system is useful in situations where epidural analgesia is contraindicated.

Epidural analgesia

An epidural is currently the most effective way of controlling labour pain - however; it is also the most complicated.

The section below sets out the details so that you can understand epidural anaesthesia:

- **What is an epidural?**
- **Who performs the epidural?**
- **What is involved?**
- **How long does it take to work?**
- **Does it always work?**
- **How long does it work for?**
- **When should I have my epidural?**
- **What is a mobile epidural?**
- **Will an epidural affect my baby or my labour?**
- **Are there any side effects or complications of epidural analgesia?**
- **Summary**

What is an epidural?

The word epidural refers to the epidural space, a space between tissue layers in the spinal column, close to the spinal cord. Nerves transmitting pain impulses (messages) from the womb and birth canal to the brain pass through the epidural space. An epidural entails injection of local anaesthetic (pain killing) drugs into the epidural space, which will block the transmission of pain impulses and therefore the sensation of pain.

Can anyone have an epidural?

Most women can have an epidural, however certain medical conditions or drug treatments may make an epidural inadvisable. In these situations an anaesthetist will discuss the options available to you.

Who performs the epidural?

An epidural is put in by an anaesthetist. Anaesthetists are doctors who have undergone specialised training for several years (see Public Information, Who are Anaesthetists for more information). The anaesthetist will ask you some questions to make sure it is safe for you to have the epidural before starting the procedure.

What is involved?

A drip will be put into a vein in your hand or arm. This is to administer intravenous fluid or drugs to prevent the fall in your blood pressure that can be a side effect of the epidural. Next your midwife will position you either on your side or sitting up on the bed. You will be asked to curl up – this opens up the spaces between the bones in your spine, which makes insertion of the epidural easier. The anaesthetist will then clean your lower back with antiseptic solution and make a small injection of local anaesthetic to freeze the skin before the epidural needle is inserted. You will need to keep very still. This can be difficult when you are in labour, but your anaesthetist will try to work between your contractions. Finally, a thin plastic tube (epidural catheter) is passed down the needle- this stays in your back when the needle is taken out. The catheter is then taped to your back. Local anaesthetic (pain killing) drugs are then administered down the catheter to control your labour pains.

How long does it take to work?

After the anaesthetist has administered the first dose of local anaesthetic drug (called a 'top- up') it usually takes about 20 minutes for the full effect to come on. You may notice that the pain with each contraction begins to lessen after ten minutes though. The lower half of your body may feel tingly or numb and you may notice that your legs feel heavy or weak. Your feet may feel warm. Quite often you may still be aware of your contractions even though there is no pain.

Does it always work?

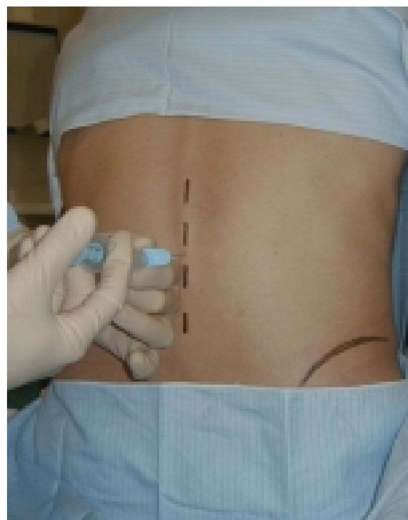
Sometimes it may be technically difficult or even impossible to locate the epidural space - however this happens infrequently. Occasionally it may not work fully or only down one side. In this the case the anaesthetist will have to adjust the epidural or even repeat it. Unfortunately a small proportion of women find the epidural of no benefit, often because there is insufficient time for it to become effective before delivery of the baby.

How long does it work for?

Your epidural can be used for all stages of your labour and delivery. The epidural catheter that is in your back allows a top-up of drugs to be administered each time any pain returns. Each top- up can last one to two hours. After delivery of your baby the catheter is removed and normal sensation will return over the next few hours. It is wise to have someone with you when you first want to get out of bed since the power in your legs may not be as good as you think!

When should I have my epidural?

An epidural can be sited at any time once you are in established labour; however, you will gain most benefit if it is sited early in labour. Once your cervix is almost fully dilated you are near the second stage of labour and it may be too late to site the epidural and for it to become effective prior to delivery.



Insertion of an epidural. The needle is inserted between the bony prominences of the vertebrae which are marked here as short black lines.

What is a mobile epidural?

With a traditional epidural, the legs often become immobile and the mother is confined to bed. In recent years, there has been a move to provide an epidural that still produces good pain relief but also allows the mother to walk around if she wants to. A weaker concentration of local anaesthetic is used; often, a small amount of an *opiate* drug is added to improve the quality of the pain relief, without affecting mobility. One of two methods for provision of a mobile epidural may be used:

a) *Low dose infusion*
The insertion technique is exactly the same, but instead of the mother receiving intermittent top-ups of local anaesthetic, the catheter is connected to a pump system which delivers the pain-killing solution continuously.

b) *Combined spinal/epidural* (CSE)
With this method, an epidural needle is inserted as before and then a second thinner needle is passed through the epidural needle a few extra millimetres into the fluid behind the epidural space. A small volume of anaesthetic drugs is injected which produce pain relief over a few minutes. The effect would only last for an hour or so. Therefore, once the thinner needle is removed, an epidural catheter is then positioned, as described earlier. Further top-up doses of weaker drugs may then be given through the catheter when needed.

Not all delivery suites can offer mobile epidurals so it is advisable to check with the medical team looking after you what types of epidural are available.

Despite the intention, some mothers may find that they are still unable to stand up freely. Do not assume that you will be able to walk.

Will an epidural affect my baby or my labour?

Small amounts of local anaesthetic drugs cross the placenta; however, there seem to be no adverse effects on the baby from these doses.

Administration of local anaesthetic drugs into an epidural may cause a drop in blood pressure. Provided this is treated quickly, there should be no detrimental effect on the baby.

The total time course of labour may be prolonged, particularly if there is no sensation of wanting to push at delivery. Assisted delivery with forceps or ventouse is, overall, a little more likely as a result.

Are there any side effects or complications of epidural analgesia?

Headache There is approximately a 1% chance of developing a severe headache. This may happen if the epidural needle pierces the membrane behind the epidural space resulting in a small leak of fluid, which in turn causes a headache. Simple treatment includes lying flat, drinking plenty of fluid and taking pain killers. In some patients additional treatment may be needed which involves a further epidural injection.

Low Blood Pressure The epidural may cause your blood pressure to fall, which may make you feel sick. Increasing the fluid in your drip or putting a special drug into the drip to return your blood pressure to normal can treat this. You should not lie flat on your back as this will worsen the problem.

Urinary retention With an epidural in place, you may find that you lose, temporarily, the sensation of a full bladder and the ability to pass urine. The midwife will review this possibility at intervals throughout labour. If she thinks that the bladder is full and you are unable to pass urine, then she may need to pass a catheter, which is removed as soon as the bladder has been emptied.

Nerve Damage There is a small potential risk of damage to the nerves in the epidural space, which may be temporary or permanent. This may manifest itself as an area of numbness or weakness in one or other leg. At the moment we estimate the risk of this to be in the order of 1 in 10,000 epidurals (0.01%).

Summary

- An epidural is the most effective way of controlling pain during labour and delivery.
- Skilled anaesthetists perform epidurals.
- Although there are some side effects, most are treated quickly and easily.
- Serious complications are extremely rare.

Anaesthesia for Caesarean Section

It may be necessary to deliver your baby by Caesarean section. This may be planned in advance as an elective procedure (for example due to the position of your baby) or occur as an emergency once you are in labour (for example if your baby becomes distressed or the labour fails to progress as expected.)

If your obstetrician decides to proceed to a Caesarean section the anaesthetist will discuss with you what type of anaesthetic is most appropriate.

An epidural or spinal anaesthetic allows you to be awake for the delivery of your baby, however in some situations a general anaesthetic may be needed. The time interval in which your baby has to be delivered may also influence the type of anaesthetic you have.

- **What to expect**
- **Epidural anaesthesia**
- **Spinal anaesthesia**
- **Combined spinal/epidural anaesthesia**
- **General anaesthesia**
- **Summary**

What to expect

Before you enter the operating theatre a drip will be sited in your hand and you will be given an antacid drink to neutralise any acid in your stomach. It is common practice for a blood pressure cuff to be put on your arm, small sticky pads to be placed on your chest to monitor your heart and an oxygen sensor to be applied to your finger. None of these hurt. It is common for you to be tilted to one side, either by moving the table position or by putting a wedge-shaped cushion under one hip.

If you have a spinal or epidural anaesthetic you may be asked to breathe some oxygen.

After the operation has started it takes approximately five minutes until delivery of your baby, followed by a further 20 to 30 minutes to repair the uterus and close up the abdomen.

It is important to note that the theatre team can consist of between six to ten staff and it is normal for things to appear busy!

Epidural anaesthesia

If you already have an epidural in place the anaesthetist can top it up with a stronger solution of local anaesthetic, if there is sufficient time. This will produce a higher level of anaesthesia and make you numb from your chest to your feet so that the operation can be carried out. The anaesthetist will check that the epidural is working before surgery starts. Although it is unusual to feel any sharp pain it is normal to feel some discomfort or pressure as the baby is delivered.

Spinal anaesthesia

This achieves the same result as an epidural. A very fine needle is used to inject a small amount of anaesthetic into the fluid that surrounds the spinal nerves.

Spinals work much more quickly then epidurals and produce a slightly better block.

They are used mostly for elective (planned) operations or during labour if you require an emergency operation but do not already have an epidural. The side effects are similar to those for an epidural.The effect of a spinal lasts for about two hours.

Combined spinal/epidural anaesthesia

This method may also be used. It has the advantages of quick onset and improved quality of block, like a spinal anaesthetic, but unlike the latter it allows for administration of extra local anaesthetic drugs into the epidural space should the effect of the spinal be inadequate or the surgery go on for a long time.

Long-acting painkilling drugs, like morphine, may also be injected through the epidural to provide pain relief in the postoperative period.

General anaesthesia

General anaesthesia late on in pregnancy can be more complicated and is therefore avoided if possible. However in some situations it may be necessary, for example:

- In emergencies when there is no time to site a spinal or top up an epidural
- If the mother is too ill to receive a spinal or epidural
- If a spinal or epidural is inadvisable due to a medical condition
- If it is technically impossible to site an epidural/spinal or if they fail to work
- If the mother refuses to stay awake.

Once in theatre, the mother is asked to breathe oxygen through a mask placed over the face for two to three minutes. Drugs are then injected through a drip to send the mother to sleep. Gentle pressure is applied to the windpipe as the mother goes to sleep – this helps to stop the possibility of stomach contents entering the mouth. Once the mother is asleep, a tube is passed into the windpipe; this may give rise to a sore throat afterwards. Anaesthetic gases are given through this tube to keep the mother asleep during the operation. Once the surgery is finished, the gases are turned off; it takes a few minutes for the mother to wake up again. She may feel disorientated and drowsy for a while afterwards. Pain relief is provided by injections of morphine, or similar drug, either into the drip or into the leg muscle. Use of these drugs adds to the sleepiness of the early postoperative period.

Summary

Different methods of anaesthesia are available for Caesarean section. The vast majority of these operations are performed using a regional anaesthetic, such as a spinal or epidural anaesthetic. As, one of many important advantages, this allows both the mother and her partner to share the experience of delivery of their baby.

Glossary

Cervix The neck of the womb

Dilation Opening

Have a show Release of a small amount of blood and mucus from the cervix

Labour – First stage The timecourse during which the cervix opens to ten centimetres, when it is fully dilated

Labour – Second stage The timecourse from full dilation of the cervix to delivery of the baby

Labour – Third stage The timecourse from delivery of the baby to delivery of the placenta

Opiate A morphine-like drug

Perineum The area between the vagina and the anus

P Millns, FRCA and K Eagland, FRCA
Birmingham Womens Hospital