

Anaesthesia

Introduction

Anaesthesia means 'loss of sensation'. Medications that cause anaesthesia are called anaesthetics.

Anaesthetics are used during tests and surgical operations to induce sleep, which prevents pain and discomfort and enables a wide range of medical procedures to be performed. Local anaesthetics and general anaesthetics are two commonly used types of anaesthetics.

A local anaesthetic is often used during minor procedures where a small area of the body is numbed and you remain fully conscious.

A general anaesthetic is often used for more serious operations where you will be totally unconscious and unaware of the procedure.

How anaesthetics work

Anaesthetics work by blocking the signals sent along your nerves to your brain. Nerves are bundles of tiny fibres that use chemical and electrical signals to pass information around your body.

Anaesthetics work by stopping the nerve signals that keep you awake and aware from reaching your brain. During this state of induced sleep, procedures can be carried out without you feeling anything. After the anaesthetic has worn off, the nerve signals will be able to reach your brain, and consciousness and feeling will return.

Types of anaesthesia

As well as local and general anaesthetic, there are a number of other types of anaesthesia. Unlike general anaesthetic, these do not make you unconscious; they stop you feeling pain in a particular area of your body. The different types of anaesthetic are described below.

Regional anaesthetic - this is a local anaesthetic given to a defined region of your body, usually served by a large nerve bundle (such as your arm), giving numbness or pain relief for deeper operations where more extensive numbness is needed.

Epidural anaesthetic - a type of regional anaesthetic usually used to numb the lower half of the body and good for pain relief - for example, during labour and childbirth.

Spinal anaesthetic - a type of regional anaesthetic used to give total numbness lasting about three hours to the lower parts of the body so that surgery can be safely carried out in this area.

Sedation - medication that makes you feel sleepy and relaxes you both physically and mentally, it is sometimes used to keep you calm during minor, painful or unpleasant procedures.

Different types of anaesthesia can be used in combination. For example, a regional anaesthetic can be used with a general anaesthetic to relieve pain after an operation.

A sedative is also sometimes used with a regional anaesthetic to help you feel relaxed and calm during an operation as well as pain free.

How anaesthetics are given

An anaesthetic can be given in a number of ways. It can be given in the form of:

an ointment, spray, or drops

an injection into a vein

a gas you breathe in

Anaesthetists or Anaesthesiologists

Anaesthetists are doctors who have received specialist training in anaesthesia. They will give you your anaesthetic and be responsible for your safety and wellbeing during your procedure.

Before the procedure, your anaesthetist will discuss a number of things with you including:

the types of anaesthetic appropriate for the procedure you are having

any risks or side effects associated with different types of anaesthetic

they will also plan your anaesthetic and pain control with you, taking into account any preferences you have for a particular type of anaesthetic

You should ask your anaesthetist to clarify anything you are unsure about, and raise any queries you have.

Your anaesthetist will carefully monitor you throughout your operation and will make sure you wake up comfortably afterwards. They may also help with any pain relief you might need following the procedure.

Side effects

Anaesthetics consist of a number of medications that can cause side effects in some people. Your anaesthetist will tell you about any side effects you may experience after having a specific type of anaesthetic, and measures that will be taken to reduce any side effects.

Some of the common side effects that can occur after having a general anaesthetic and some regional anaesthetics include:

- feeling sick or vomiting
- dizziness and feeling faint
- feeling cold or shivering
- headache
- itchiness
- bruising and soreness
- difficulty passing urine
- aches and pains

The side effects of anaesthetic do not usually last very long and some of them can be treated if necessary.

You should tell the healthcare professionals treating you if you experience any of the above side effects or if you are in pain after your procedure.

Risks and complications

In recent years, having anaesthesia has become extremely safe. Advances in equipment, medication and training mean serious problems are rare.

As with surgery and any medical procedure, however, there is a potential risk of complications. The benefits and risks to surgery and

anaesthesia will be carefully weighed up and explained to you before you have any operation.

Very rare possible complications include:

an allergic reaction to an anaesthetic medication (anaphylaxis) - although this can be severe, appropriate treatment is on hand to enable the best chance of dealing with this effectively and immediately

permanent nerve damage - which can cause numbness or paralysis (inability to move a part of the body), although this may be a result of the surgery itself

death - there are approximately ten deaths for every million anaesthetics given in the UK

Your risk of developing complications will depend on a number of factors including:

your medical history - for example, whether you have any other serious medical conditions or illnesses

personal factors - for example, whether you smoke or are overweight (if you smoke, stopping several weeks before your operation will reduce your risk of having breathing problems; likewise, losing weight will help reduce your risk)

the type of procedure - for example, whether it is a planned procedure or an emergency procedure, or whether it is a major or minor procedure

the type of anaesthetic - local anaesthesia can have advantages over general anaesthetics in the right circumstances

Before your procedure, your anaesthetist will explain if there are any particular risks of developing possible complications.

In most cases, the benefits outweigh the risks. Any concerns you have should be discussed with your anaesthetist before surgery.

Epidural anaesthesia

Epidural anaesthesia, often referred to as "an epidural", is an injection in the lower back that numbs the nerves and stops you feeling pain.

Areas that can be numbed by an epidural include the:

chest

abdomen

pelvic area

legs

How an epidural works

During an epidural, an anaesthetist uses a needle to locate an area of the spine known as the epidural space. An anaesthetist is a doctor specially trained to provide pain relief during surgical procedures.

The anaesthetic works by numbing pain nerves as they enter the spine. The extent of the numbness will depend on the type of drug used, and the amount injected. Once the medication has worn off, feeling in the affected areas will return.

When is an epidural used?

An epidural can be used to provide pain relief in a number of different situations including:

during natural childbirth

during an operation, instead of a general anaesthetic

after surgery that has been carried out under general anaesthetic (where you are unconscious during the operation)

This topic focuses mainly on having an epidural during labour and childbirth.

Safety

Epidurals have been routinely used for many years and are widely accepted as an effective method of providing pain relief after surgery, and during labour and childbirth.

However, as with many medical procedures, there are some associated risks that, although small, you should be aware of before deciding whether to have an epidural. Two possible risks include:

puncture of the dura – the dura is the thickest, outermost layer that surrounds the spinal cord and brain; the risk of the dura being punctured is about one in 100

nerve damage – which occurs only very rarely

Effectiveness

Although epidurals are commonly used to provide pain relief, they are not always effective at reducing labour pain. The Obstetric Anaesthetists Association estimate that one in eight women who have an epidural during labour need to use additional methods of pain relief.

When an epidural is used

An epidural is a type of local anaesthetic. It can be used to completely block pain while you are awake.

This has the advantage of allowing you to avoid the common side effects of general anaesthetic, such as feeling sick and dizzy. In addition, you will avoid the rare, but serious, complications of a general anaesthetic.

Epidural anaesthesia can be used to numb sensation and provide pain relief in a number of situations including:

during natural childbirth

during a Caesarean section, where a baby is delivered through a cut that is made in the abdomen

after surgery that has been carried out under general anaesthetic

during other types of surgery, such as knee surgery, hip replacement surgery, rib or chest fractures and amputation of the lower limbs

Epidurals are most commonly associated with being used to reduce pain and discomfort during labour and childbirth. This topic focuses mainly on this use of epidural anaesthesia.

Labour and childbirth

Some women decide to have an epidural during labour and childbirth. Your midwife will be able to advise you about having an epidural and whether they think it is necessary. However, remember that the final decision will be yours.

An epidural may be recommended to help relieve pain during:

a particularly painful, complicated or prolonged labour

the delivery of twins or triplets

a Caesarean section delivery if an epidural was sited during labour

an assisted delivery – where either forceps or a suction cap (Ventouse) is attached to the baby's head to help with the delivery

Mobile epidurals

Mobile epidurals, also known as walking epidurals, are low-dose epidurals that may be used during labour. A smaller amount of local anaesthetic is used in combination with other painkilling medication.

As your nerve sensations will not be completely blocked, a mobile epidural provides pain relief without as much of the numbness or heavy-legged feeling that is experienced during a full epidural.

Another advantage of having a walking epidural is that you will be able to feel the contractions and the need to push during the final stages of labour.

As you will still have some sensation in your legs, you will also be able to move around if you need to, although it is not always recommended.

Why epidurals might not be used

In rare cases, an epidural is not recommended. For example, it may not be suitable if you:

are allergic to local anaesthetics

you are taking medication to thin your blood, such as warfarin

have a blood-clotting abnormality that increases your risk of bleeding

have previously had back surgery, or you have other problems with your back

have a spinal deformity or severe arthritis in your spine

have a neurological condition that affects your nervous system, such as spina bifida

Your anaesthetist will be able to provide you with more information and discuss the potential risks in these situations.

How an epidural is performed

If you choose to have an epidural, the procedure will be carried out by an anaesthetist. An anaesthetist is a doctor, specially trained in providing patients with pain relief during medical procedures.

Having an epidural

Most epidurals are given while the patient is sitting down and leaning forwards. Alternatively, an epidural can be carried out while you are lying on your side with your knees drawn up and your chin tucked in.

Lying or sitting in these positions opens up the spaces between the bones of your spine (vertebrae) and allows the epidural needle to be passed into the epidural space more easily. This is an area through which the nerves from your spine to your body pass.

Before the epidural needle is inserted, a sterilising solution is rubbed into your back and sterile drapes are placed over your back, leaving the injection site exposed.

An injection of local anaesthetic into the skin helps to reduce any discomfort. A hollow needle is then inserted and a thin, plastic tube (epidural catheter) is passed through the middle of the needle, into the epidural space. The epidural anaesthetic can then be injected through the tube.

If you are having an epidural during childbirth, you will need to have a drip in your hand so that fluid and medication can be given to help prevent low blood pressure, a common side effect of epidurals. The drip may restrict you from moving around freely.

While you are having an epidural inserted, you may experience a brief stinging sensation as local anaesthetic is injected into the skin. You may also experience slight discomfort in your back when the epidural needle is positioned, and the catheter is inserted.

If you feel pain or an electric shock-like feeling, tell your anaesthetist, because the catheter may be pressing against the root of a nerve and may need to be repositioned.

Effects of an epidural

Shortly after having an epidural you will start to experience a warm, numbing sensation in your lower back and legs. Your legs may feel heavy and more difficult to move. It usually takes about 20-30 minutes for the epidural to take full effect.

The nerves in your bladder are also likely to be affected by the anaesthetic. This means you won't know when your bladder is full, and whether you need to go to the toilet. To prevent damage, a thin plastic

tube (catheter) will be used to drain urine from your bladder. Your bladder sensation will return to normal when the epidural is stopped.

After having an epidural

Following epidural anaesthesia, it is likely you will be advised to rest in a lying or a sitting position until the feeling in your legs returns.

It usually takes a couple of hours for the feeling to return to your legs and you may experience a slight tingling sensation on your skin as the anaesthetic starts to wear off. You may need help getting out of bed.

If you start to feel any pain, you should tell the doctor or nurse who is treating you. They will be able to give you medication to help control it.

After having an epidural you will be able to breastfeed your baby

Side effects of an epidural

There are several potential side effects that can occur after having epidural anaesthesia.

Low blood pressure

Low blood pressure (hypotension) is the most common side effect associated with having an epidural. This is because the local anaesthetic used affects the nerves that go to your blood vessels, leading to a fall in blood pressure. This may cause lightheadedness or nausea.

Your blood pressure will be closely monitored while you are having an epidural. If necessary, medication can be passed through a drip to treat low blood pressure.

Pain and discomfort

You may experience some slight discomfort when local anaesthetic is injected to numb the skin during epidural insertion. However, you should not feel pain when drugs are injected into the epidural space.

Sometimes, it is also possible for an epidural to be unsuccessful. For example, this might occur if:

it proves difficult to find the epidural space

the local anaesthetic does not spread evenly around the epidural space

the catheter falls out

If your epidural fails to work, your anaesthetist will see you and attempt to improve the numbness. If the epidural cannot be improved, they will offer alternative pain relief, which may include performing the procedure again.

Loss of bladder control

After having an epidural, you will not be able to feel when your bladder is full. This is because the epidural affects the nerves around your bladder.

A catheter will be inserted into your bladder to allow urine to drain away. Your bladder control will return to normal as soon as the epidural wears off.

Itchy skin

Sometimes, the painkillers that are combined with local anaesthetic during an epidural can cause itchiness. If you develop itchy skin it can usually be treated.

Sickness

You may feel sick (or actually be sick) after having an epidural. However, you are more likely to experience this side effect with a general anaesthetic. If your blood pressure is normal, anti-sickness medicines will usually help.

Backache

A study carried out in 2010 found no increased risk associated with the use of epidural anaesthesia and long-term backache.

Your epidural care team will try to ensure you are comfortable during and after the procedure, but being in the same position for a prolonged period may inevitably make existing backache worse.

If you experience severe backache in the weeks following an epidural, you should report your symptoms to your care team as soon as possible so they can investigate the problem.

Complications of an epidural

Epidural anaesthesia is usually a safe and reliable method of providing pain relief. However, as with most medical procedures, complications can sometimes occur.

Severe headaches

Following surgery, minor headaches are common. Occasionally, a more severe headache can develop after an epidural, known as a post-dural puncture headache.

Post-dural puncture headaches are caused when the lining of your spinal cord (dura) is accidentally punctured. This can occur during insertion of the epidural.

If the epidural needle punctures the dura, the fluid inside will leak out, resulting in a fall in the pressure of your brain and spinal cord. The decrease in pressure can lead to a persistent headache.

Although the headache symptoms may resolve with time, a procedure known as a 'blood patch' can be used to seal up the hole. It involves taking a small sample of your own blood and injecting it into the epidural space. When the blood clots (thickens), the hole will be sealed and your headache will stop.

It should be noted that headaches caused by a punctured dura are uncommon following an epidural. There is a 1 in 100 to 1 in 500 chance of it happening.

Infection

Infections are a rare complication of an epidural.

However, it is possible for an infection to develop at the site of the injection in the weeks following an epidural. This can lead to serious complications, such as an abscess (a painful collection of pus) forming.

It is rare for an infection to spread beyond the injection site.

Epidural haematoma

An epidural haematoma is a very rare complication of an epidural.

A haematoma is a collection of blood that builds up in an organ, a tissue or space. It develops as a result of a break in a blood vessel wall.

The epidural space is filled with a number of veins. If the veins are punctured, blood can build up within the epidural space. A build-up of blood can result in the formation of a haematoma, causing pressure on your spinal cord.

This may lead to severe nerve damage, such as paraplegia (complete loss of movement of the lower half of the body, including your legs). However, this further complication is also very rare.

Other complications

Other possible, although rare, complications of an epidural include the following:

fits (convulsions)

breathing difficulties

nerve damage leading to a numb patch of skin

other causes of nerve damage

death

However, serious complications following an epidural are rare. The best estimate of the overall risk of permanent harm from an epidural in labour is between 1 in 80,000 and 1 in 320,000.

Before deciding to have an epidural, you should discuss the procedure with your anaesthetist. They will be able to provide further information and advice about the risks of developing complications such as those described above.

General anaesthetic

As well as general anaesthetic, there are several other types of anaesthetic, which can be used for certain procedures. They include:

local anaesthetic

epidural anaesthetic

spinal anaesthetic

nerve blocks

General anaesthetic medicines information

General anaesthetics are medications used to cause a loss of consciousness so you're unaware of surgery.

Despite there being a number of theories about how general anaesthetics work, the precise mechanisms remain unknown.

However, it is known that all anaesthetics interrupt the passage of signals along the nerves. This means that any stimulation to the body doesn't get processed or recognised by the brain.

How general anaesthetics are given

General anaesthetic will be given to you by an anaesthetist (a specially trained doctor). It will either be given as a:

liquid that's injected into your veins through a cannula (a thin, plastic tube that feeds into a vein, usually on the back of your hand)

gas that you breathe in through a mask

Your anaesthetist will stay with you throughout the procedure. They will make sure you continue to receive the anaesthetic and you stay asleep, in a controlled state of unconsciousness.

After the procedure, the anaesthetist will turn off the anaesthetic and you will gradually wake up.

When general anaesthetics are used

General anaesthesia is essential for some surgical procedures where it may be safer or more comfortable for you to be unconscious. It's usually used for long operations or those that may be very painful. Examples include surgery to remove the gallbladder, hernia repair, liposuction or a hysterectomy.

Before having an operation, you will meet your anaesthetist and plan your anaesthetic together.

Your anaesthetist will look at your medical history and will ask whether anyone in your family has had problems with anaesthesia. They will also ask about your general health and lifestyle, including whether you:

have any allergies

smoke or drink alcohol

are taking any other medication

Your anaesthetist will also be able to answer any questions you have. Let them know if you're unsure about any part of the procedure or if you have any worries or concerns. You should be given clear instructions to follow before the operation, including whether you can eat anything in the hours leading up to it.

Side effects

General anaesthetics have some common side effects. Your anaesthetist should discuss these with you before your surgery.

Most side effects occur immediately after your operation and don't last long. Possible side effects are listed below.

Feeling sick and vomiting after surgery – about 33% of people feel sick after an operation. This usually occurs immediately, although some people may continue to feel sick for up to a day.

Shivering and feeling cold – about 25% of people experience this. Shivering may last for 20-30 minutes after your operation.

Confusion and memory loss – this is more common in elderly people and is usually temporary.

Chest infection – this can sometimes occur in people who have abdominal surgery. It will make you feel feverish (hot and cold) and cause breathing difficulties.

Bladder problems – men may have difficulty passing urine and women may leak urine. This is more common after a spinal or epidural anaesthetic.

Dizziness – you will be given fluids to treat this.

Bruising and soreness – this may develop in the area where you were injected or had a drip fitted. It usually heals without treatment.

Sore throat – during your operation, a tube may be inserted either into your mouth or down your throat to help you breathe. Afterwards, this causes a sore throat in about 40% of people.

Lip or dental damage – about 5% of people may have small cuts to their lips or tongue from the tube, and around 1 in 4,500 people may have damage to their teeth.

Complications and risks

A number of more serious complications are associated with general anaesthetics, but they are very rare (occurring in less than one case for every 10,000 anaesthetics given).

Possible complications include:

a serious allergic reaction to the anaesthetic (anaphylaxis)

an inherited reaction to the anaesthetic

death – this is very rare (there is approximately one death for every 100,000 general anaesthetics given)

Complications are more likely to occur if you:

are having major surgery or emergency surgery

have any other illnesses

smoke

are overweight

Your anaesthetist will discuss the risks with you before your operation. You may be advised to stop smoking or lose weight, if doing so would reduce your risk of developing complications.

In most cases, the benefits of being pain-free during an operation outweigh the risks.

While it's possible for a person under general anaesthetic to wake during surgery and experience pain, this is very rare. The chance of this happening has been greatly reduced by using monitors to measure the amount of anaesthetic being given.

Anaesthetic, local

Introduction

Local anaesthetic may be used in dental procedures, such as removal of a tooth

Local anaesthetic is a type of painkilling medication that is used to numb areas of the body during some surgical procedures.

The word "anaesthetic" comes from the Greek word meaning the absence or loss of sensation.

Local anaesthetic is different from general anaesthetic which is used for larger operations when a person needs to be unconscious. You stay awake when you have a local anaesthetic.

How does local anaesthetic work?

Local anaesthetic causes a complete loss of feeling to a specific area of your body without making you lose consciousness. It works by blocking the nerves from the affected part of your body so that pain signals cannot reach your brain. You will not be able to feel any pain during the procedure but you may still feel some pressure or movement.

It only takes a few minutes to lose feeling in the area where local anaesthetic is given. The doctor will make sure that the area is fully numb before starting the procedure. It can take a few hours for local anaesthetic to wear off and for full feeling to return. You should be careful not to damage the area during this time. You may be offered painkillers if it's thought that you'll be in pain after the anaesthetic has worn off.

When is local anaesthetic used?

Local anaesthetic is often used by dentists, surgeons and GPs when carrying out minor operations on small areas of the body. For example, local anaesthetic is often used during:

the removal of a tooth or a filling

minor skin surgery, such as the removal of moles, warts and verrucas

some types of eye surgery, such as the removal of cataracts (cloudy areas in the lens of the eye)

some types of biopsies, such as a needle biopsy, where a tissue sample is removed for examination under a microscope

Local anaesthetic is also sometimes used during more major surgical procedures, such as certain types of brain surgery.

For example, it may be used when a brain tumour is located in the area of the brain that controls speech. As the tumour is being removed, you will need to remain conscious so that you can respond to the surgeon's instructions. This helps them ensure that your speech is harmed as little as possible during the procedure.

Some creams and ointments that are available over the counter from pharmacists contain local anaesthetic. For example, gels for mouth ulcers sometimes contain small amounts of benzocaine, which numbs the area around the ulcer.

Epidural anaesthetic

Epidural anaesthetic is sometimes used during childbirth to ease the pain of labour or after surgery that has been carried out under general anaesthetic.

An epidural is a type of local anaesthetic that works by blocking the nerve roots from the spinal cord. If a woman decides to have an epidural during childbirth, anaesthetic will be injected into the area below the spinal cord (epidural space). This numbs the lower part of the body so that she does not feel any pain while giving birth.

Regional anaesthetic

This is also known as peripheral nerve block anaesthetic. A nerve block is an injection of local anaesthetic near a nerve to block pain during and after surgery. This may be used for an operation on a hand, arm or leg so that it can be carried out without the need for a general anaesthetic.

An ultrasound scan is often used to pinpoint the correct nerve, and the injection should not be painful.

The block usually takes full effect in about 30 minutes and it may be used in combination with general anaesthetic.

A screen is used during any operation that follows so that you do not see the surgery taking place.

Side effects

There may be temporary side effects after local anaesthetic is used, but there should be no long-lasting problems.

Side effects can include:

a numb tongue

dizziness

blurred vision

twitching muscles

If you have any of these symptoms, tell the doctor who administered the local anaesthetic. In rare cases, these symptoms can progress to more serious complications such as seizures (fits) or cardiac arrest (when the heart stops pumping blood around the body).