Royal College of Anaesthetists

Association of Anaesthetists

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Patient Information Forum

Anaesthesia explained

This booklet is designed to be read in the run up to surgery and can be viewed wherever you wish on your computer, tablet or phone. It explains how the hospital team will prepare you for an anaesthetic and care for you both during your operation and your recovery.

It will give you information to help you make an informed decision about any choices available to you for your anaesthetic, including information on benefits, possible side effects and complications.

All the photographs were taken in real hospital settings and show, with permission, real patients having real anaesthetics. We are grateful to them for their help.

This booklet explains to you and your relatives or carers how you may receive anaesthesia and pain relief for your operation. It has been written by patients, patient representatives and anaesthetists, working together.

It is intended to give you some understanding of what anaesthetics are and how they are given. Sometimes there are choices about which anaesthetic or pain relief technique you would prefer. You can find out more from your surgeon, from your preoperative assessment clinic visit or from an anaesthetist.

There are differences in how much information each person wants. We offer some information here and suggest how and where you can find out more.

Contents

What is anaesthesia?

The word anaesthesia means 'loss of sensation'. It can involve a simple local anaesthetic injection which numbs a small part of the body, such as a finger or around a tooth. It can also involve using powerful drugs which cause unconsciousness or 'general anaesthesia'.

These drugs also affect the function of the heart, lungs and circulation. As a result, general anaesthesia is only given under the close supervision of an anaesthetist or anaesthesia associate, who is trained to consider the best way to give you an effective anaesthetic while keeping you safe and well.

The drugs used in local anaesthesia work by blocking the signals that pass along your nerves to your brain. When the drugs wear off, you start to feel normal sensations again.

Types of anaesthesia

General anaesthesia

General anaesthesia is a state of controlled unconsciousness during which you feel nothing. You will have no memory of what happens while you are anaesthetised.

A general anaesthetic is required for a very wide range of operations. This includes most major operations on the heart, lungs or in the abdomen, and many operations on the brain or the major arteries.

Anaesthetic drugs are injected into a vein, or anaesthetic gases are given to you to breathe. These drugs stop the brain from responding to sensory messages travelling from nerves in the body.

Anaesthetic unconsciousness is different from a natural sleep. You cannot be woken from an anaesthetic until the drugs are stopped and their effects wear off.

Shortly after the anaesthetic has started (left) and in the operating theatre (right)

While you are unconscious, the team in theatre look after you with great care. Your anaesthetist stays near to you all the time.

Anaesthetist and patient in theatre (left) and an anaesthetist and anaesthetic nurse with the patient in the operating theatre (right)

Local anaesthesia

A local anaesthetic numbs a small part of the body where you are having the operation. It is used when nerves can be easily reached by drops, sprays, ointments or injections. You stay conscious, but free from pain. Common examples of surgery using local anaesthetic are having teeth removed and some common operations on the eye.

Regional anaesthesia

This is when a local anaesthetic drug is injected near to the nerves that supply a larger or deeper area of the body. The area of the body affected becomes numb.

Spinal and epidural anaesthesia

Spinals and epidurals are the most common types of regional anaesthetics. These injections can be used for operations on the lower body, such as caesarean section, bladder operations or replacing a hip. You stay conscious, but free from pain.

Preparing for a spinal anaesthetic and waiting for it to take effect

Other types of regional anaesthesia

Other types of regional anaesthetics involve an injection placed near to a nerve or group of nerves, for example in the arm or leg. This is often called a 'nerve block' and can allow you to have the operation without a general anaesthetic.

Nerve blocks are also useful for pain relief after the operation, as the area will stay numb for a number of hours.

Shortly after caesarean section with a spinal anaesthetic

Regional anaesthetic injection at the knee

For more information, see our leaflet on *Nerve blocks for surgery on the shoulder, arm or hand* which is available from our website: rcoa.ac.uk/patientinfo/leaflets-video-resources

Sedation

Sedation involves using small amounts of anaesthetic drugs to produce a 'sleep-like' state. There are different levels of sedation. Commonly, sedation will make you feel drowsy and relaxed about what is happening. You may sleep for a period but the person giving your sedation will speak with you and you may be aware of where you are for some of the procedure.

Some people having a local or regional anaesthetic do not want to be fully awake for surgery. They choose to have sedation as well.

You may remember everything, something or nothing after sedation. However, sedation does not guarantee that you will have no memory of the operation. Only a general anaesthetic can do that.

For more information about sedation, please see our *Sedation explained* leaflet which is available on our website: rcoa.ac.uk/patientinfo/sedation

Preparing for surgery – the team is constantly alert to your condition and safety

Combinations

Anaesthetic techniques can often be used together. For example, a regional anaesthetic may be given for pain relief after an operation for which you have had a general anaesthetic. The general anaesthetic allows you to remain unconscious and remember nothing.

The anaesthetist

Anaesthetists are doctors who have had specialist training in anaesthesia. Your anaesthetist is responsible for:

- assessing whether you are fit enough to have the anaesthetic for your operation
- talking to you about which type of anaesthetic might be best and getting your permission (consent) for it
- agreeing a plan with you for your anaesthetic and organising pain control afterwards
- looking after you in the operating theatre and closely monitoring your condition throughout the operation
- looking after you immediately after the operation in the recovery room or in an intensive care unit.

Anaesthetists at work

Grades of anaesthetist

Following full training as a doctor, it takes at least seven years to train to be a consultant anaesthetist. A consultant anaesthetist has completed the full anaesthetic training.

In the UK it is a requirement that a named senior anaesthetist is involved in the care of every patient who will be undergoing surgery. This does not mean that a consultant will give every anaesthetic. You can ask to talk to a consultant or senior anaesthetist if you want to.

Specialty and Associate Specialist (SAS) anaesthetists

Other experienced anaesthetists work as specialty doctors or associate specialists. These SAS doctors have at least two years of specialist training in anaesthesia, but many have years of experience working as an anaesthetist. Depending on their skills and experience these doctors may work alone, but can ask for advice or assistance if required.

You may also encounter trust-grade doctors or clinical fellows, who often have less experience and are likely to be supported by a more senior doctor.

Anaesthetists in training

Although they are called trainees, anaesthetists in training are registered doctors who are carefully trained and assessed in each specialty area of anaesthesia. Their title refers to their year of training (ST7 being the most experienced people who are close to starting their consultant posts). All trainee anaesthetists will be appropriately supervised and a consultant is always available if they are needed. You can find out more about the different stages of anaesthetic training on our website: rcoa.ac.uk/considering-career-anaesthesia/stages-training

Anaesthetists in training: in the anaesthetic room (left) and out on the ward talking to a patient and his parent (right)

The anaesthesia team

Anaesthetists are supported in their work by trained staff. Staff working in theatre all wear the similar scrub suits (cotton tops and trousers) of various colours. All staff should be wearing name badges showing their name and role.

Operating department practitioners (ODP)

These staff have completed a three-year degree course on patient safety and care of the patient. They then work in various roles to support the anaesthetist and the surgeon, and to provide care in the recovery room.

Anaesthesia Associates

Anaesthesia Associates are healthcare professionals who work as part of the anaesthetic team under the supervision of a consultant anaesthetist. They have had dedicated training in anaesthesia to safely administer anaesthetics.

You can find out more about Anaesthesia Associates on our website: rcoa.ac.uk/patientinfo/anaesthesia-team

Theatre nurses

Theatre nurses have completed a full general nursing training and have chosen to specialise in theatre work. An extra six-month training course in anaesthetics allows them to work as an anaesthetic assistant.

Anaesthetic nurse assisting the anaesthetist

Recovery-room staff

Staff in the recovery room may be nurses or ODPs. They will look after you immediately after you leave the operating theatre. They look after your breathing, pain relief and fluids, and monitor you closely until you are ready to return to the ward.

Medical students and other staff in training

There may be staff in training in the theatre. They can only take part in your care if they are carefully supervised and with your permission.

In the recovery room

Preparing for an operation

As soon as you know that you may be having an operation, it is helpful to think about how you can improve your recovery from surgery by improving your health and lifestyle and increasing your activity.

The time that you have to prepare will vary depending on how urgent your operation is. This is particularly important for major surgery. The best outcomes will come from you working with your medical team in the weeks and months before the surgery. If your operation is an emergency, your doctors and nurses will give you good care in the condition you are in.

Our Fitter Better Sooner resources will provide you with the information you need to become fitter and better prepared for your operation. Please see our website for more information: rcoa.ac.uk/fitter-better-sooner

Medical problems

If you have a long-term condition, such as diabetes, asthma or bronchitis, heart problems, are overweight or have high blood pressure, you should make sure you are as well as possible before your operation. If you think you could make some improvements, you can ask your GP for an extra check-up. You should do this as soon as you know that you are having an operation.

Smoking

If you smoke, you should consider giving up before your operation. Smoking reduces the amount of oxygen in your blood and increases the risk of breathing and heart problems during and after the operation. Your surgical wound may heal more slowly and may be more likely to get infected if you smoke. On average, smokers stay in hospital longer than non-smokers.

The time before an operation is ideal to quit smoking. You may need the support of a specialist stop-smoking service. Your GP will be able to give you contact details for services in your area. You are four times more likely to give up successfully if you have this kind of help. For more information please go to: nhs.uk/smokefree

Your weight

Many of the risks of having an operation are increased if you are very overweight. Reducing your weight will reduce many of the extra risks you face during your anaesthetic and after your surgery. It may also make the surgery easier. Your GP can give you advice about weight loss and put you in touch with an organisation that can help. Slow, supervised weight loss is likely to be most successful.

To read more about how your weight can affect anaesthesia, please see our *Anaesthesia and your weight* leaflet which is available from our website: rcoa.ac.uk/patientinfo/leaflets-video-resources

Alcohol and other substances

If you drink more than the recommended amount, you should cut down before an operation. Go to the NHS website for more advice: nhs.uk/livewell/alcohol/pages/alcohol-units.aspx

For your own safety, your anaesthetist needs to know if you are on the contraceptive pill or have used any recreational drugs.

Your teeth

Ideally, loose and broken teeth should be assessed and treated before an anaesthetic as this reduces the risk of any damage to your teeth or them becoming displaced (see pages 14 and 15). On the day of your operation, your anaesthetist will want to know which teeth are loose, have crowns or a bridge.

Cardiopulmonary exercise testing (CPET)

Before major surgery, if you have medical risks your surgeon may ask you to do a CPET test before you decide that you will have the operation. This gives important information about your level of fitness, your risk and how well you will tolerate and recover from a major operation. This helps you decide whether an operation is right for you or whether other lower-risk treatments might be better for you. The test also helps your surgeon and anaesthetist decide how best to look after you during and after the operation.

A CPET exercise test

The CPET test is usually done on a stationary cycle. You will be asked to wear a mask so the team can measure the oxygen that you use and the carbon dioxide that you breathe out.

If you cannot turn the pedals due to problems with your legs, it may be possible to use a machine that you turn with your arms.

Sometimes the exercise test team will suggest an activity programme designed to improve fitness to help you get through your operation safely.

This would only be if the operation is not an emergency and can be safely delayed.

Makeup, nail varnish and false nails

Makeup or body lotions are best avoided as they prevent heart monitor pads and dressings from sticking properly. Please remove nail varnish and ask for advice about false nails.

Some types of false nail interfere with monitoring the oxygen level in your blood. This is because a clip is used which usually shines a light through your fingernail.

Jewellery

You should remove jewellery and/or any decorative piercings ideally before you go to hospital. If you cannot remove it, the nurses will cover it with tape to prevent damage to it or to your skin. A wedding ring can usually be worn. It is important to remove any piercings around the lips and tongue before an anaesthetic to prevent difficulties and injury from the equipment used to look after your airway and breathing.

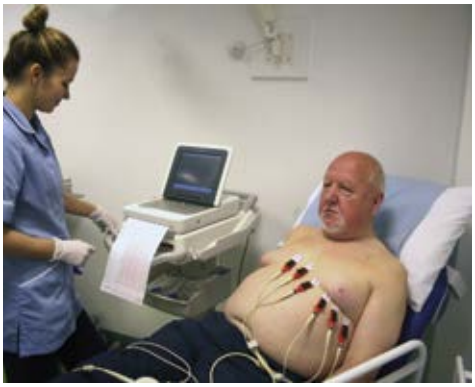
The preoperative assessment clinic

Before your anaesthetic we need to know about your general health. Some hospitals use a health questionnaire or you may be invited to a preoperative assessment clinic. Alternatively, you may receive a telephone or virtual assessment such as a Skype or Zoom video call. If you are having an urgent operation, the health check will be done by your doctors and nurses on the ward.

In most preoperative assessment clinics you will see a specialist preoperative assessment nurse. An anaesthetist may also see you, especially if you are having a major operation.

In the preoperative assessment clinic

Tests that you need will be arranged for you. These may include blood tests, an ECG (electrocardiogram or heart tracing), an x-ray, a swab for the bacterial infection MRSA or other tests. Some tests can be done in the clinic, but for others you will need to come back on another day.



Having an ECG (heart tracing)

This is a good time to ask questions and talk about any worries that you may have. If the staff in the clinic cannot answer your questions, they will help you find someone who can.

Health-check information

You may be asked about:

- your activity and any physical and mental health problems you might have
- any serious illnesses you have had
- problems with previous anaesthetics
- problems you know about when people in your family have had an anaesthetic
- symptoms relating to the heart or lungs such as chest pain, shortness of breath, palpitations or dizzy spells
- heartburn or indigestion pain
- medicines that you take, including those you can buy over the counter and vitamins or herbal remedies
- allergies and reactions (please bring any details you have of the name of the drug and the reaction, including any letters if you have any)
- smoking habits and the amount of alcohol you drink, and
- use of recreational drugs such as cocaine or marijuana, heroin or the so called 'legal highs'.

Pills, medicines, inhalers, and herbal remedies

An accurate list of your medicines is very important. Please bring with you either the pills themselves or a copy of your prescription from your GP.

Delays to your operation

If your operation is not urgent, the anaesthetist or nurse at the preoperative assessment clinic may talk to you about taking some time to improve your health. More tests may be needed or some treatment may need to be started. They would do this working closely with your surgeon.

It is also possible that the anaesthetist you see may think that there are very high risks if you have the operation. You may want time to think about whether to go ahead with the operation.

Taking part in a clinical trial

Anaesthetists are always trying to improve the care that you receive. Clinical trials are studies of groups of patients that allow treatments to be compared. You may be asked to take part in a trial. A trial nurse or doctor will explain in detail what is involved and your consent will be sought. If you agree, you will receive full written information. It is your decision whether to take part, and you can withdraw at any time. If you can help, other patients in the future will benefit from the results of the trial.

Benefits and risks of having an anaesthetic

Anaesthesia has made modern surgery possible. Complex operations can be performed with a high degree of comfort and safety. However, there are risks associated with having an anaesthetic. These may be weighed up against the likely benefits of the operation.

Everyone varies in the risks they are willing to take. Your anaesthetist will describe the risks to you, but only you can decide how much the risk affects your plan to have the operation you would like.

Thinking about risk

The risk to you as an individual depends on:

- whether you have any other illnesses
- personal factors, such as whether you smoke or are overweight, and
- whether the operation is complicated, long, or is an emergency procedure.

To understand the risk fully you need to know:

- how likely it is to happen
- how serious it could be, and
- how it can be treated if it happens.

The anaesthetist can also advise you whether there are any anaesthetic techniques that will reduce these risks.

Side effects and complications

Anaesthetic risks can be described as side effects or complications. These words are somewhat interchangeable, but are generally used in different circumstances, as shown below.

Side effects are the unwanted but predictable and expected effects of drugs or treatments. For example, sickness is a side effect of a general anaesthetic, although steps are taken to prevent it.

Complications are unwanted and unexpected events due to a treatment. However, they are recognised as events that can happen. An example is a severe allergic reaction to a drug, or damage to your teeth when inserting a breathing tube. Anaesthetists are trained to prevent complications and to treat them if they happen.

See the section of our website for more information on anaesthesia and risk:
rcoa.ac.uk/patientinfo/risk

Anaesthesia explained

Common events and risks that healthy adult patients of normal weight face when having a general anaesthetic for routine surgery are summarised in our risk infographic below.

VERY COMMON
More than 1 in 10
Equivalent to one person in your family

Thirst

Sore throat or sickness

Bruising

Temporary memory loss (mainly in over 60s)

COMMON
Between 1 in 10 and 1 in 100
Equivalent to one person in a street

Pain at the injection site

Minor lip or tongue injury

UNCOMMON
Between 1 in 100 and 1 in 1,000
Equivalent to one person in a village

Minor nerve injury

RARE
Between 1 in 1,000 and 1 in 10,000
Equivalent to one person in a small town

1 in 1,000
Peripheral nerve damage that is permanent

1 in 2,800
Corneal abrasion (scratch on eye)

1 in 4,500
Damage to teeth requiring treatment

1 in 10,000
Anaphylaxis (severe allergic reaction to a drug)

VERY RARE
1 in 10,000 to 1 in 100,000 or more
Equivalent to one person in a large town

1 in 20,000
Awareness during an anaesthetic

1 in 100,000
Loss of vision

1 in 100,000
Death as a direct result of anaesthesia

The risks we all take in normal life, **such as road travel**, are actually far higher than the very rare risks above.

More information on these risks and how to prepare for surgery can be found on our website here: rcoa.ac.uk/patientinfo/risks/risk-leaflets

Anaesthesia explained

For specific information on the different risks involved in anaesthesia, please see the following leaflets which are all available on our website: rcoa.ac.uk/patientinfo/risks/risk-leaflets


Feeling sick


Sore throat


Shivering


Damage to teeth, lips and tongue


Damage to the eye during general anaesthesia


Postoperative chest infection


Becoming confused after an operation


Accidental awareness during general anaesthesia


Serious allergy (anaphylaxis)


Headache after a spinal or epidural injection


Nerve damage associated with having an operation under general anaesthetic


Nerve damage associated with a spinal or epidural injection


Nerve damage associated with peripheral nerve block


Equipment failure


Death or brain damage

In the few days before your operation

Medicines

You should continue to take your medicines up to and including the day of the operation unless you are told not to.

Please follow carefully the instructions you have been given in the preoperative assessment clinic. Please look out for specific instructions if you take:

- drugs to thin your blood (for example, warfarin, dabigatran, rivaroxaban, clopidogrel, aspirin)
- drugs for diabetes
- all herbal remedies, and
- some blood-pressure pills.

Taking a shower

Some hospitals give patients a disinfecting shower gel to use for several days before the operation. It helps to prevent serious infections such as MRSA. You should use this gel on your body and hair as directed.

Packing a bag for hospital

Whether you are staying overnight or whether your operation is day case, it is a good idea to bring comfortable clothes and footwear. Temperatures in hospital can vary so some layers of clothing can be useful. See NHS Choices for further information on what to pack for hospital:
nhs.uk/conditions/having-surgery/preparation

On the day of your operation

The hospital should give you clear instructions about eating and drinking, which you should follow carefully.

You may be given:

- a time to stop eating, or drinking anything except still tap water, and
- a time to stop drinking still tap water. Keep yourself well hydrated before this time. The reason is that if there is food or liquid in your stomach during your anaesthetic, it could come up into the back of your throat and then go into your lungs. This would cause choking, or serious damage to your lungs.

In an emergency, when people have not had time to stop eating and drinking, an anaesthetic can be given safely using a different technique.

Usual medication

If you are asked to take your usual medications, it is important to take these with a small sip of water.

If you feel unwell on the day of your operation you should phone the ward that is expecting you and ask their advice.

Meeting your anaesthetist

You will normally meet your anaesthetist on the ward before your operation.

Your anaesthetist will look at the information from your health check or preoperative assessment and ask further questions about your health. They may listen to your chest and look in your mouth. You will be able to ask questions and discuss any concerns you may have.

Your anaesthetist may delegate some or all of these tasks to an Anaesthesia Associate.

Choice of anaesthetic

Sometimes there is a choice about which kind of anaesthetic and pain relief is best for you. Having talked about the benefits, risks and your preferences, you and your anaesthetist will decide together which anaesthetic you will have if there are any choices to be made.

Nothing will happen to you until you understand and consent to what has been planned. You can refuse the treatment or ask for more information, or more time to decide.

Pre-medication

A 'pre-med' is a medication which is sometimes given shortly before an operation for a number of reasons. You may commonly be offered drugs to reduce acid in your stomach, to prevent sickness or to manage pain after the operation. Sometimes you may be offered medication to help you relax.

Can my operation be cancelled at the last minute?

Unfortunately, cancellations do happen at the last minute if time runs out in theatre or there is no bed available. Occasionally, your anaesthetist or surgeon may find something about your health which is not expected. They might recommend that your operation is delayed until the problem has been investigated, reviewed or treated. This will be discussed with you and your surgeon.

Getting ready for theatre

Hospitals all vary slightly as to how and where patients get ready for the operating theatre.

Changing for theatre

You will be given a hospital gown to wear. You may like to wear your own dressing gown over this while you wait. Wear some slippers or shoes that are easy to take off when you arrive in the theatre.

You can usually wear a plain wedding band, which will be taped to keep it safely in place.

You will usually be given two identity bracelets to wear.

You can keep your underwear on as long as it does not get in the way of the operation. Ask your nurse if you are unsure.

A patient in a hospital gown (left) and a patient wearing surgical stockings (right)

Surgical stockings to prevent blood clots

Your anaesthetist is jointly responsible, with the surgeon and the team in theatre, for treatment to reduce the risk of blood clots. These clots can form in your legs when you are lying very still during the operation.

Most patients will need to wear surgical stockings. A member of staff will measure your legs and can help you put the stockings on as they are very tight.

Personal items

You can wear glasses, hearing aids or dentures until you go to the anaesthetic room, where you will need to remove them. The team will look after them carefully.

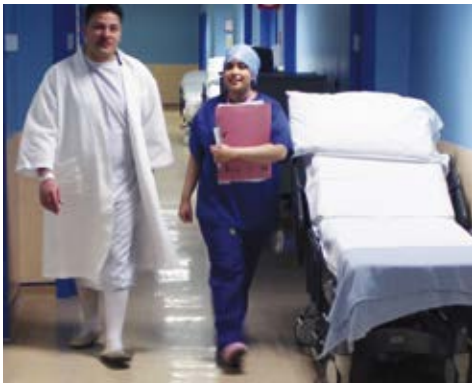
Waiting to go to theatre

There may be some waiting around before you go to theatre. Staff will try to keep this time to a minimum but it is a good idea to bring something to do, such as a book or a tablet, or you can listen to music through headphones.

If the wait is likely to be longer than two hours, it should be possible for you to have some more water to drink. Ask your nurses for advice if you feel thirsty.

Going to theatre

Most people walk to the operating theatre. If you are walking, you can wear your own dressing gown and slippers. If you cannot walk far, a wheelchair may be used. If you have had a pre-med that makes you sleepy, you will go on a trolley or bed.



A patient walking to theatre with a member of staff

The operating theatre department

The operating theatre department includes the anaesthetic room, theatres and a recovery room. It is usually brightly lit and may have no natural light. Air conditioning may make it feel cool. It is a good idea to wear a dressing gown or ask for a blanket.

If you have walked to theatre, you will now be asked to lie on a theatre trolley. This is narrower than a bed and may feel quite firm to lie on.

Checks

When you arrive in the department, staff will check your name, your identity band and what operation you are having. If relevant, they will ask you if the operation is on the right or left side of your body. They will also ask when you last ate or drank and if you have any allergies. These safety checks must be done several times before your actual operation to make sure that you receive the correct care.

In the anaesthetic room

Some hospitals do not have separate anaesthetic rooms. If this is the case in your hospital, you will receive the care described here in the operating theatre itself.

The anaesthetic room

This room is next to the operating theatre.

An anaesthetic room

Several people will be there, including your anaesthetist and an ODP or anaesthetic nurse (see page 7). In some hospitals, anaesthesia associates are part of the anaesthetic team. There may also be an anaesthetist or other healthcare professional in training and a nurse from the theatre team.

Before anything further happens the team will make another check of your name, hospital number, date of birth and what operation you are expecting, to make sure all the details agree with the planned operation.

Monitors

The ODP or anaesthetic nurse will attach you to monitoring equipment, which allows the team to closely follow your wellbeing during your operation.

Heart monitor

Sticky patches will be placed on your chest that give a heart tracing on the monitoring screen.

Sticky pads connect wires to the chest for monitoring the heart

Blood pressure

A cuff is placed around your arm, attached to a blood pressure monitor. The monitor is usually set to read your blood pressure every five minutes or less.

Oxygen levels

A peg with a red light inside it is placed on your finger or other places such as your ears or toes. This continuously measures your oxygen level.

Oxygen level monitor – can be placed on the finger or toe or ear lobe

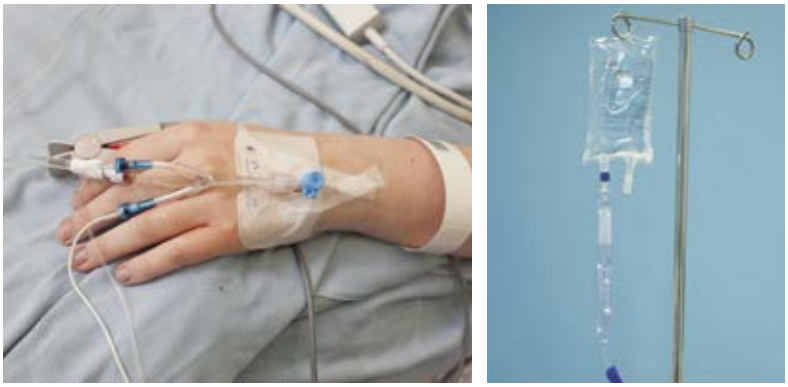
Other monitors may be used for more complex surgery. All this information is passed to the screen (below left) so the anaesthetist can quickly see that you are responding well to the anaesthetic.

In this hospital the patient is starting their anaesthetic in the operating theatre – the same care is given as in hospitals who use anaesthetic rooms

Setting up your cannula

Your anaesthetist will need to give you drugs into your blood stream. They will do this through a small plastic tube placed in the vein. This tube is called a **cannula**.

A needle is used to put the cannula into a vein on the back of your hand or in your arm. If you have any concerns about this, please talk to your anaesthetist.



Cannula in place attached to tubing for fluid and drugs (left) and a bag of fluid is attached to the cannula

The anaesthetist will use a tourniquet (a tight band) around your arm to make the vein more obvious. Often, the anaesthetic practitioner will hold or squeeze the arm instead of using a tourniquet.

Putting a cannula into the back of the hand

Cannulas are colour coded by size

Different sized cannulas are available for different purposes. The anaesthetist will use the smallest one that meets your needs.

Sometimes, it can take more than one attempt to insert the cannula. Occasionally other sites are used, such as the foot.

Intravenous fluids – 'a drip'

You need to receive fluids during most operations to prevent dehydration. This may be continued after surgery until the time that you can drink normally. Your anaesthetist can give you sterile fluid through a drip into your cannula to keep the fluids in your body at the right level. Any blood you need will also be given through the cannula.

Cannulas for children and those who find needles difficult

Local anaesthetic cream can be used to reduce the sensation when the needle is inserted. The cream is used routinely for children. Adults can ask their anaesthetist about it if they have particular worries about the cannula.

A nurse applies a clear plastic dressing to keep the cream in place over a vein. Most creams take at least 30 minutes to work

Two sites are usually prepared in case an alternative is needed

Anaesthesia explained

An important piece of equipment is the anaesthetic machine. You can see it on the left of this photograph. It delivers oxygen and anaesthetic gases in controlled amounts. This anaesthetic machine has the monitoring equipment on the upper shelf, above the gas controllers.

Having a general anaesthetic

You now have a cannula in place and the monitoring equipment is attached.

The anaesthetist will usually ask you to breathe pure oxygen from a light plastic face mask before the anaesthetic begins. If you are worried about using a face mask, please tell your anaesthetist.

Patient using a face mask

Two ways of starting a general anaesthetic

- Anaesthetic drugs are given through your cannula. This is the usual way of starting the anaesthetic if you are an adult or older child. Some people report a light-headed feeling first, and most people become unconscious within one minute.
- Or, you can breathe a mixture of anaesthetic gases and oxygen through the light plastic face mask. The gases smell quite strong, and it usually takes two or three minutes to become unconscious. After you are unconscious, your anaesthetist will insert the cannula.

Looking after your breathing

Your anaesthetist will choose a way of making sure that oxygen and gases can move in and out of your lungs easily. Usually this means a tube is placed in your airway. There are different types of tube for different circumstances.

To read more about the importance of managing your airway and breathing, please see our *Your airway and breathing during anaesthesia* leaflet which is available from our website: rcoa.ac.uk/patientinfo/leaflets-video-resources

Child with Guedel airway

Intubated woman

In the operating theatre

When you are fully anaesthetised, the anaesthetic team will take you into the operating theatre.

Compulsory checks

An anaesthetist watching the monitors during anaesthesia, with the patient nearby

A 'stop' moment for the team as the WHO checks are done

Before the operation begins, the NHS requires that the whole team has to make final checks on you, your care and the equipment for the procedure.

Why is there tape on the eyes?

Most people do not close their eyes naturally when they have a general anaesthetic. This means there is a risk that something may brush against the open eye. Also, the cornea (clear surface of the eye) will dry out. Both these put you at risk of small grazes on the cornea. Tape or eye ointments prevent this.

For more information see our leaflet *Damage to the eye during general anaesthesia*, which is available from our website: rcoa.ac.uk/patientinfo/risks/risk-leaflets

More information about general anaesthesia

These are some of the drugs that you may receive during a general anaesthetic.

Anaesthetic drugs or gases

- Injected drugs are given through your cannula into your blood. The most commonly used is called propofol. It is a white liquid given in carefully controlled amounts.
- Anaesthetic gases. There are several of these – the most common in the UK are sevoflurane and isoflurane.

You will receive one of these drugs continuously, to keep you unconscious as long as the operation lasts. The amount of anaesthetic you receive is closely monitored.

Pain-relieving drugs

These are given to reduce your body's reaction to the surgery, as well as to provide pain relief afterwards.

Muscle relaxants

These are needed for certain operations only. They relax the muscles completely and the anaesthetist uses a ventilator to do the breathing for you. At the end of the operation, you will not be woken up until the anaesthetist is sure that the drugs have worn off.

Drugs used during a general anaesthetic

Other drugs

- **Antibiotics** to prevent infection.
- **Anti-sickness drugs**.
- **Paracetamol and other drugs** to help with pain relief.
- **Drugs to treat low blood pressure**.

Other care you will receive

Your anaesthetist shares responsibility with the surgeon and the theatre team for your overall wellbeing in the operating theatre.

Keeping you warm

The team will take care to keep your body temperature as close to normal as possible. They will measure your temperature during the operation, and will use warming mats or other equipment as needed.

For more information, please see our risk leaflet on *Shivering* which is available from our website: rcoa.ac.uk/patientinfo/risks/risk-leaflets

Hot air warming device in use

Protecting pressure points

Your anaesthetist will also make sure that you are positioned as comfortably as possible. Bony parts such as your heels and elbows will be cushioned. Other parts will also be protected to reduce the risk of any damage to nerves.

For more information, please see our risk leaflet on *Nerve damage associated with an operation under general anaesthetic* which is available from our website: rcoa.ac.uk/patientinfo/risks/risk-leaflets

Gel pad to protect the elbow

Preventing blood clots

As well as surgical stockings, the theatre team may also use cuffs around your calves or feet which inflate every now and then to move the blood around in your legs to reduce the risk of blood clots forming.

Intermittent calf compression device in use

Having a regional or local anaesthetic

These anaesthetics are started in the anaesthetic room or in the operating theatre. There are many kinds of regional or local anaesthetic. All types involve an injection of local anaesthetic drug. You will be awake for the injection unless you have asked to have sedation (see page 5). Regional anaesthesia provides pain relief on its own for operations such as caesarean section, hip or prostate surgery. Alternatively, you may have a regional as well as a general anaesthetic to help with pain relief after an operation. For example, this may be helpful in major bowel surgery.

Spinal or epidural anaesthetic

These are used for operations on the lower half of your body. They both involve an injection in the back.

- A spinal anaesthetic is a single injection which makes you numb for up to two hours. Strong pain killers can be added to the local anaesthetic.
- An epidural is a fine, flexible tube placed in the back near the nerves coming from the spinal cord, through which pain-killing drugs can be given to give pain relief.
- 'Top-up' local anaesthetic is given for pain relief through the catheter, which can make the numbness last many hours or a few days.

Starting a spinal anaesthetic

You will normally have the injection sitting or lying on the trolley or operating table. The anaesthetist and the team will explain how to get into the right position.

Patient, anaesthetist and anaesthetic practitioner preparing to start a spinal anaesthetic

Local anaesthetic is given into the skin to reduce the pain of the injection. Your anaesthetist will ask you to stay as still as possible and to tell them if you feel any tingling or shock sensations.

It can take several attempts to get the fine needle in the correct position. If you find this difficult, tell your anaesthetist as there are things they can do to help, including switching to a different kind of anaesthetic.

You may notice a warm tingling effect as the anaesthetic starts to take effect before your legs and lower part of your body become numb. You will usually have little movement in your legs. The anaesthetist will only allow the surgery to begin when they are satisfied that the anaesthetic is working.

Most people feel well immediately after an operation with a spinal anaesthetic.

This woman is in the recovery room with her recovery nurse (also see photos on page 4 of this patient during her operation, and more information about the recovery room on page 30)

An anaesthetist cleaning his hands with iodine

For more information, please see the leaflets *Your spinal anaesthetic* and *Epidural pain relief after surgery,* which are available from our website: rcoa.ac.uk/patientinfo/leaflets-video-resources

Other types of regional anaesthetic

Other regional anaesthetics often involve an injection placed near to a nerve or group of nerves. This is called a 'nerve block'. This can allow you to have the operation without a general anaesthetic. Or, you can have a nerve block as well as a general anaesthetic for longer-lasting pain relief.

A nerve block is useful for:

- operations on the arm or lower leg
- operations on the artery in the neck, and
- operations on the abdomen, where a nerve block can be used for extra pain relief, alongside a general anaesthetic.

Ultrasound guidance

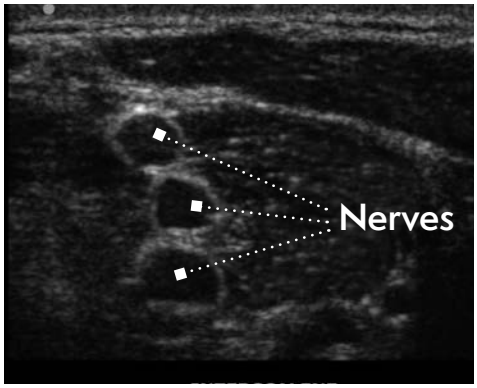
Anaesthetists often use an ultrasound machine to identify the exact position of the nerves.

Your anaesthetist will ask you to tell them if you feel any tingling or sharp pains during the injection.

These injections can be done using a nerve stimulator instead of an ultrasound image.

For more information see the leaflet *Nerve blocks for surgery on the shoulder, arm or hand,* which is available from our website: rcoa.ac.uk/patientinfo/leaflets-video-resources

Preparing to do an ultrasound-guided regional anaesthetic at the knee



Ultrasound image of nerves above the collarbone. A nerve block here is used for operations on the shoulder or arm

In the operating theatre with a regional anaesthetic

The operating theatre is often a busy place, with staff bustling about getting ready for your operation. Music may be playing. Staff may need to move you from the trolley across to the operating table. The monitoring equipment will be reconnected and 'bleeps' will start indicating your pulse. A blood pressure cuff on your arm will take your blood pressure regularly.

A cloth screen is used to shield the operating site, so you will not see the operation unless you want to. Your anaesthetist is always nearby and you can speak to them when you want to.

Recovering from a regional anaesthetic

It will take some hours for feeling to return to the area of your body that was numb. This ranges from one hour to about 18 hours depending on the type of regional anaesthetic you have had.

During this time, staff will explain to you how to make sure that the numb area is protected from injury.

You can expect tingling as the feeling returns. This passes within the first hour, but if you then feel the pain of the operation you should tell staff immediately so they can give you some pain-relief medicine.

Surgery with a spinal anaesthetic

In the recovery room

After most anaesthetics, you will be cared for in a recovery room close to the operating theatre. Surgeons and anaesthetists are close by if there is any change in your condition.

Recovery room with child's mother present

Staff in the recovery room will include nurses and ODPs. They are trained to deal with critical situations that can happen after surgery, such as bleeding or low blood pressure. They will also treat any pain or sickness that you have. Most people receive extra oxygen in the recovery room, through a face mask or through little tubes that sit under the nostrils.

If you gave dentures, hearing aids or glasses to staff, they will usually be returned to the ward for safe keeping.

You will be taken back to the ward when the recovery room staff are satisfied that you are safely recovering normally. You can eat or drink according to the instructions of the surgeon and/or anaesthetist.

High dependency unit (HDU) or intensive care unit (ICU)

After some major operations, you may need care in the HDU or ICU. If this is planned, it will be discussed with you beforehand.

A ward round on the high dependency unit

For more information about this care, please see the leaflet *Your anaesthetic for major surgery with planned high dependency care or intensive care afterwards,* which is available from our website: rcoa.ac.uk/patientinfo/leaflets-video-resources

Blood transfusion

Blood is lost during most operations. The anaesthetist will give you fluids through your cannula to make up for this loss. If a larger amount of blood loss is expected, your healthcare team may use a machine which recycles your blood so it can be returned to you. This is called 'cell salvage'.

Cell saver in use

Your anaesthetist may also need to consider giving you a blood transfusion. For more information about a blood transfusion, please see the information on the NHS website: nhs.uk/conditions/blood-transfusion

Pain relief

Good pain relief after your operation is important. As well as making you comfortable, it allows you to get active more quickly and reduces complications.

If you have good pain relief, you will be able to:

- breathe deeply and cough, at least gently (which will help make sure you do not develop a chest infection after your operation); and
- move about freely. Exactly how much and how soon you will move around the bed, or get out of bed, will depend on the operation you have had and your general state of health. Early movement helps prevent blood clots in your legs (deep-vein thrombosis or DVT). Getting out of bed helps you to expand your lungs and to avoid a chest infection. It also helps prevent stiff joints, an aching back and pressure sores where you have been lying.

This member of staff is a physiotherapist – she is helping this patient take breaths and expand his lungs fully – good pain control is essential for this care to be effective

Not everyone needs to see a physiotherapist for this type of care. Your doctors and nurses will ask for this kind of physiotherapy for you if they think it is needed.

Planning your pain relief

Your anaesthetist will talk with you before your operation about pain relief afterwards. You can discuss your preferences and decide together what pain relief you will have. They will prescribe some pain relief, and more will be available if you need it.

The amount and type of pain relief you need depends on the operation you are having. Some people need more pain relief than others.

- Pain relief can be increased, given more often, or given in different combinations.
- Most pain-relief treatments also have side effects. Your doctors will take these effects into consideration as they advise you on which type of pain relief is best for you.

- Occasionally, pain is a warning sign that all is not well, so you should tell your nurses about any pain you experience.
- It is easier to keep pain under control if we treat it early, so let your nurse know as soon as possible if you think the pain is getting worse.

Pain-relief teams

Most hospitals have a team of nurses and anaesthetists who specialise in pain relief after surgery. The doctors and nurses on the ward can call them for advice if your pain is difficult to control.

Ways of taking pain relief

Your anaesthetist will be able to talk with you about which types of pain relief are appropriate for you.

Pills, tablets or liquids to swallow

Pills, tablets or liquids are used for all types of pain. They typically take 30 minutes to work and are best taken regularly. You need to be able to eat and drink without being sick for these drugs to work.

Injections into a muscle

These are not needed very often, but may be prescribed as an extra form of pain relief if you unexpectedly have a lot of pain. They may be given into your leg or buttock muscle and typically take 10–15 minutes to work.

Suppositories

These waxy pellets are placed in your rectum (back passage). The drug dissolves and is absorbed into the body, typically taking 20 minutes to work. They are useful if you cannot swallow or feel very sick.

Intravenous pain relief (into a vein)

During your anaesthetic and in the recovery room your anaesthetist and nurses may give you drugs into your blood through your cannula. This means they work more quickly than if the same drugs are given as a tablet or injection into a muscle.

Pain-relief drugs

Two basic types of pain-relief drug are given commonly.

- paracetamol
- anti-inflammatory medicines (for example, ibuprofen and diclofenac).

Each of these medicines can be given as a tablet or liquid to swallow, by an injection into a muscle or vein, or as a suppository. They can be used together as they belong to different drug types.

Anti-inflammatory drugs have a number of side effects which make them unsuitable for some people. Your anaesthetist will consider this before prescribing them for you.

Opiate pain-relief medicines

These drugs are used after operations that are expected to cause considerable pain.

Morphine, diamorphine, pethidine, codeine, tramadol and oxycodone are all opiate pain-relief medicines. They may be given as a tablet or liquid to swallow, as an injection into a muscle, or intravenously (your bloodstream) into your cannula.

Side effects are common with these drugs. These include feeling sick, vomiting, itching, drowsiness and, if used over a few days, constipation. Larger doses can cause very slow breathing and low blood pressure. The nursing staff will watch you closely for all of these side effects. If they happen, other treatments will be given to keep you safe.

Anti-sickness drugs will be given as well. One in three people find opiates unpleasant, but they are the most effective pain-relief medicines in many circumstances.

Other ways of giving pain relief

Patient-controlled analgesia (PCA)

This is a system which allows you to control your own pain relief. Opiate drugs (see above) are put into a pump which is connected to your cannula. The pump has a handset with a control button which you will be shown how to operate. When you press the button, a small dose of the opiate drug goes straight into your cannula.

Using a PCA allows you to help yourself to a small dose of pain relief very frequently. The anaesthetist sets the dose and also a minimum time limit between doses (usually five minutes). After that time has passed, you can decide whether you want another dose. The drug goes straight into a vein, so it works very quickly. You can continue to press the button at five-minute intervals until your pain is reduced to an acceptable level for you. You can then have further doses to top up your pain relief as you need them, to keep yourself comfortable.

Your nurses watch you carefully while you are using a PCA, to make sure that you are reacting safely to the pain-relief medicine.

There is evidence that patients benefit from being in control of their own pain relief. This type of pain relief is at least as safe, or safer, than other ways of giving opiate pain relief.

Local-anaesthetic catheters

These are fine tubes which the surgeon can place under the skin, near to your surgical wound or to the nerves that supply the area. Not all operations are suitable for having local-anaesthetic catheters.

Each catheter is attached to a pump that contains local anaesthetic. The local anaesthetic blocks pain signals from nearby nerves and should reduce your pain. The pump can be kept running for several days.

These catheters do not always relieve pain well, but there is evidence which shows that they are generally helpful, with few side effects.

An epidural catheter for pain relief

This is a system for pain relief for operations commonly on the lower body but also for some operations on the chest and upper abdomen.

A fine tube (epidural catheter) is placed into your back, using a needle. A pump is used to run local anaesthetic continuously into the epidural catheter. This makes the lower half of your body become numb. The numbness lasts as long as the catheter is in place and the pump is running. When the catheter is removed, feeling in the area gradually returns to normal.

An epidural can be used for pain relief for most major operations on the lower body. For more information, please see the leaflet *Epidural pain relief after surgery,* which is available from our website: rcoa.ac.uk/patientinfo/leaflets-video-resources

Pain relief at home

Your anaesthetist or doctors and nurses on the ward (or both) will make a plan for your pain relief after discharge.

- You may be asked about pain-relief drugs that you already have at home, such as paracetamol and ibuprofen. It is a good idea to stock up on pain-relief tablets before you come into hospital. Staff at the preoperative assessment clinic will be able to advise.
- You should take tablets for pain relief regularly to best manage your pain. Regular use of these simple pain killers significantly reduces the amount of strong painkiller you will need (such as morphine or codeine) and the side effects associated with stronger drugs.

You may be advised to take several different types of pain relief. It is important that you understand how to use the different drugs and that you are aware of possible side effects. This will be explained to you. It is helpful if a relative or friend listens when this information is given, to help you remember what to do. Ideally you will receive written information as well.

You may go home on opioid-based pain killers following your operation. It is important that you reduce and then stop these medications as soon as possible, as their continued use can cause you significant harm. Your GP can help you in reducing these after surgery and you should seek their advice if you encounter difficulties. You should be fully advised on this before you leave hospital.

Who can give me advice when I am at home?

Before you leave the ward, you should make sure you know who to contact and how if you develop significant pain or other problems at home. You may get this information from:

- the member of staff who arranges your discharge from hospital
- the doctors on the ward, or
- your surgeon or anaesthetist.

This is especially important if you go home on the day of your operation.

How did it all go?

Occasionally, problems happen during an anaesthetic which may affect you the next time you need an anaesthetic. For example, you may have had an allergic reaction to a drug, or it may have been difficult to place a breathing tube in your airway. Your anaesthetist will have told you about anything significant that has happened. It will be recorded in your hospital notes and your GP should be told. It is helpful though to ask for a letter explaining the problem if one is not offered. You can then make sure that any future anaesthetist knows all about it – particularly at a different hospital or overseas.

After an anaesthetic

How you feel afterwards depends mainly on the operation you have had, and on the pain-relief medicine that you need to treat any pain that you have.

General anaesthetics can cause side effects which are generally short-lived (last a few hours). They are listed on page 14.

You may feel tired or even exhausted for some days after an operation. After major surgery, this can last for weeks or months and is very unlikely to be caused by the anaesthetic. Causes of tiredness after surgery include:

- anxiety
- poor sleep patterns
- pain
- blood loss causing anaemia
- the condition that needed the surgery, and
- poor eating and drinking.

These will gradually improve as you leave hospital and you are healing.

Disclaimer

We try very hard to keep the information in this leaflet accurate and up-to-date, but we cannot guarantee this. We don't expect this general information to cover all the questions you might have or to deal with everything that might be important to you. You should discuss your choices and any worries you have with your medical team, using this leaflet as a guide. This leaflet on its own should not be treated as advice. It cannot be used for any commercial or business purpose.

For full details, please see our website: rcoa.ac.uk/patientinfo/resources#disclaimer

Information for healthcare professionals on printing this leaflet

Please consider the visual impairments of patients when printing or photocopying this leaflet. Photocopies of photocopies are discouraged as these tend to be low quality prints and can be very difficult for patients to read. Please also make sure that you use the latest version of this leaflet, which is available on the RCoA website: rcoa.ac.uk/patientinfo/anaesthesia-explained

Tell us what you think

We welcome suggestions to improve this leaflet.

Please complete this short survey at: surveymonkey.co.uk/r/testmain

Or by scanning this QR code with your mobile:

If you have any general comments, please email them to: patientinformation@rcoa.ac.uk

Royal College of Anaesthetists
Churchill House, 35 Red Lion Square, London WC1R 4SG
020 7092 1500

rcoa.ac.uk

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This leaflet will be reviewed within three years of the date of publication.