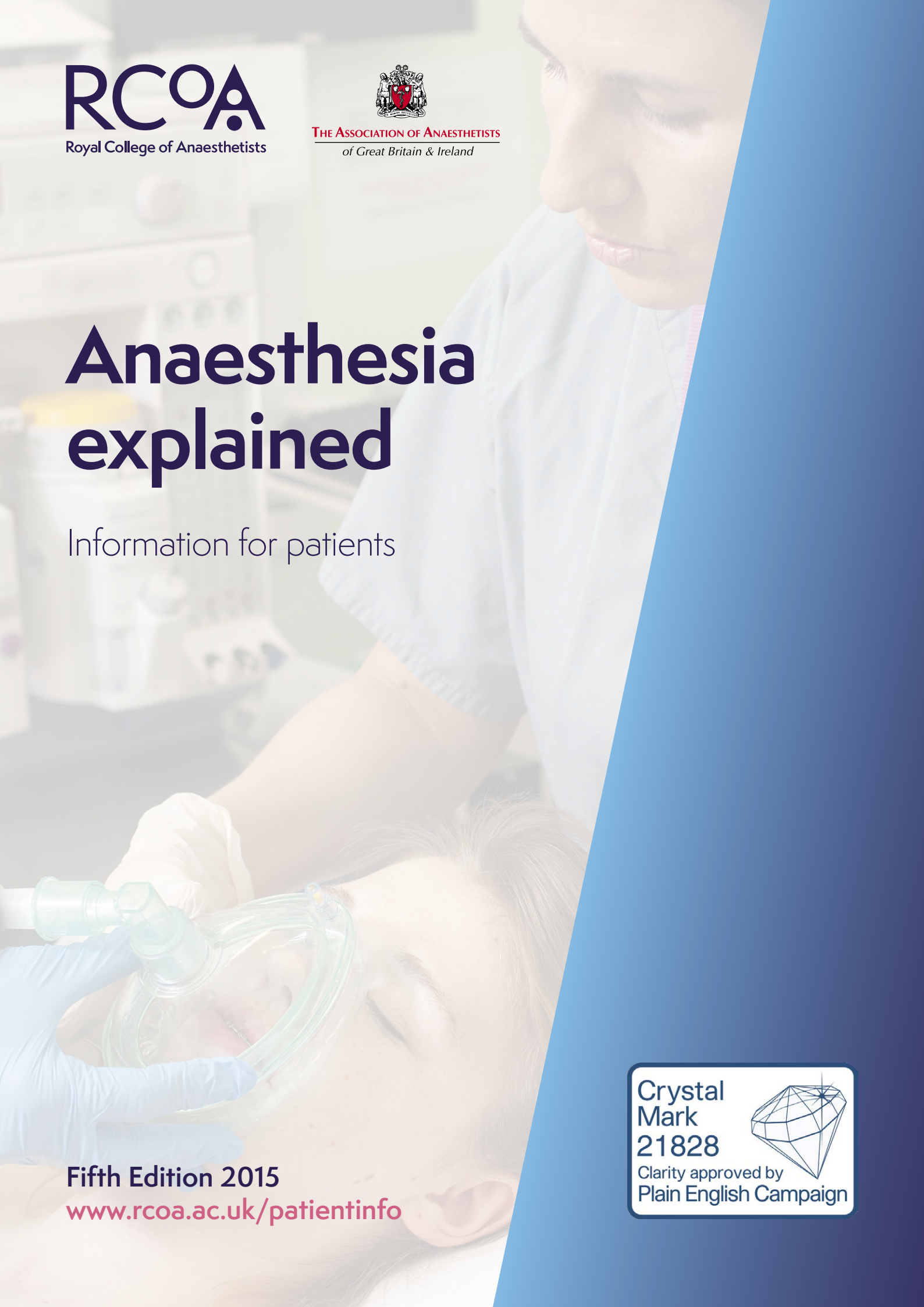


Royal College of Anaesthetists

The Association of Anaesthetists
of Great Britain & Ireland

Anaesthesia explained

Information for patients

Fifth Edition 2015

www.rcoa.ac.uk/patientinfo

Crystal Mark 21828
Clarity approved by Plain English Campaign

This booklet is designed to be read in clinics, in waiting rooms, in wards and at home. It explains how the team at the hospital will prepare you for an anaesthetic and then care for you, as you have your operation and afterwards.

It provides a basis for you to make an informed choice about what kind of anaesthetic you will have and gives basic information about the side effects and complications of anaesthesia.

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

This booklet offers you and your relatives or carers an explanation of 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 a good place to start in gaining some understanding of treatment that may be offered by your anaesthetist. Sometimes there are choices as to which anaesthetic or pain-relief technique you would prefer. You can find out more from your surgeon, from a pre-assessment clinic or from your own anaesthetist.

There are wide differences in how much information people want. We offer some information here and suggest how and where you can find out more.

Throughout this leaflet, we have used this symbol to show that more detailed information is available via the RCoA website.

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.

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

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

Types of anaesthesia

Local anaesthesia

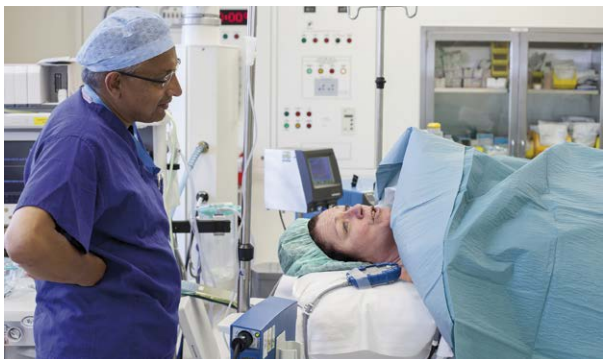
A local anaesthetic numbs a small part of the body. It is used when the nerves can be easily reached by drops, sprays, ointments or injections. You stay conscious, but free from pain. Common examples of surgery under local anaesthetic are having teeth removed and some common operations on the eye.

Regional anaesthesia

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

Spinal and epidural anaesthetics

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



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

Shortly after Caesarean section with a spinal anaesthetic

Regional anaesthetic injection at the knee

Other types of regional anaesthetic

Other 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'. This 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.

For more information, see the leaflet below on nerve blocks on shoulder, arm, hand:

www.rcoa.ac.uk/document-store/nerve-blocks-surgery-the-shoulder-arm-or-hand.

Sedation

Sedation involves using small amounts of anaesthetic drugs to produce a 'sleep-like' state. It makes you physically and mentally relaxed, but not unconscious.

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

If you have sedation, you may remember little or nothing about the operation or procedure. However, sedation does not guarantee that you will have no memory of the operation. Only a general anaesthetic can do that.

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 essential for a very wide range of operations. This includes all major operations on the heart or lungs or in the abdomen, and most operations on the brain or the major arteries. It is also normally needed for laparoscopic (keyhole) operations on the abdomen.

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

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

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.

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 (below)

Combinations

Anaesthetic techniques are often combined. For example, a regional anaesthetic may be given for pain relief afterwards, and a general anaesthetic makes sure you remember nothing.

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

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
- giving the anaesthetic and organising pain control afterwards, and
- looking after you immediately after the operation in the recovery room or in an intensive care unit.

Anaesthetists at work

Grades of anaesthetist

Following basic medical training, it takes at least seven years to train to be a consultant anaesthetist.

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

Anaesthetists in training

As the specialist training is seven years long, senior trainee anaesthetists have a substantial amount of experience. All trainee anaesthetists will be appropriately supervised and a consultant is always available if they are needed.

Anaesthetists in training: in the anaesthetic room and out on the ward talking to a patient and his parents

The team

Anaesthetists are supported in their work by trained staff. Staff working in theatre usually wear the same colour scrub suits – although the colour varies between hospitals. All staff should be wearing name badges which say what their role is.

Operating department practitioners (ODP)

These staff have done a two-year training course to learn to help the anaesthetist and the surgeon and to provide care in the recovery room.

Theatre nurses

Theatre nurses have completed full general-nursing training. They 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

In the Recovery Room

Recovery-room staff

These staff may be nurses or ODPs.

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 carefully supervised and with your permission.

Physicians' assistant (anaesthesia) [PA(A)s]

These staff are trained to look after you while you are anaesthetised. An anaesthetist is present at the beginning and the end of the anaesthetic. PA(A)s are not doctors but they have the specialist training needed. They work within strict procedures and they will call an anaesthetist immediately if needed.

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 be as healthy and fit as possible.

The time that you have to prepare will vary depending on the reason for the operation. If your operation is not too urgent, you can ask for extra time to get fit, if you want to. If your operation is an emergency, your doctors and nurses will give you good care in the condition you are in.

Medical problems

If you have a long-term condition, such as diabetes, asthma or bronchitis, heart problems or high blood pressure, you should make sure you are as well as possible before your operation. If you think you could make some improvement, 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 will heal more slowly and be more likely to get infected if you smoke. On average, smokers stay in hospital longer than non-smokers.

If you plan to quit smoking, it is a good idea to get help from a counsellor or support 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: **www.nhs.uk/smokefree**.

Your weight

Many of the risks of having an operation are increased if you are very overweight. 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.

Alcohol

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

Your teeth

Ideally, loose teeth should be secured before an anaesthetic. This reduces as far as possible the chance of any damage to your teeth (see page 42). On the day of your operation, your anaesthetist will want to know which teeth are loose, or have crowns or a bridge.

Fitness testing before an operation

Your surgeon may ask you to do a fitness test before you decide that you will have the operation. A fitness test gives information about how risky the operation is for you. This helps you decide whether an operation is right for you. There may be other less risky treatments that would be better for you. The test also helps your surgeon and anaesthetist decide how best to look after you during and after the operation.

The fitness test is usually done on a stationary cycle. You are 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 that an activity programme designed to improve fitness would help you get through your operation safely. This would only be if the operation can be safely delayed. Your surgeon would help you arrange this.

A cardio-pulmonary exercise test

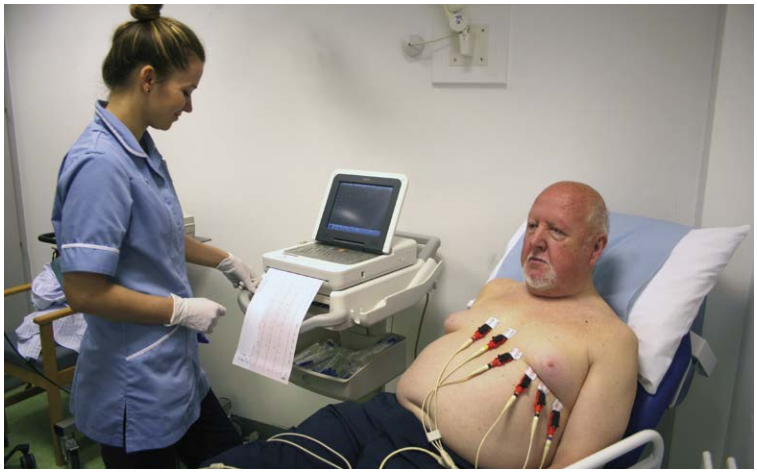
The pre-assessment clinic

Before your anaesthetic we need to know about your general health. Some hospitals use a health questionnaire, or you may be invited to a pre-assessment clinic. If you are having an urgent operation, the health check will be done by your doctors and nurses on the ward.

In most pre-assessment clinics you will see a pre-assessment nurse specialist. An anaesthetist may also see you, which is especially useful if you are having a major operation.

In the pre-assessment clinic

Tests that you need will be arranged. This may include blood tests, an ECG (electrocardiogram or heart tracing), an X-ray, or other tests. Some tests can be done in the clinic, but for others you will need to come back another day.



Having an ECG (heart tracing)

This is a good time to ask questions and talk about 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 general health and activity level
- 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
- smoking habits and the amount of alcohol you drink, and
- if you use 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 complete list from your GP.

Delaying your operation

If your operation is not urgent, the anaesthetist or nurse at the pre-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 thinks 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 which allow treatments to be compared. You may be asked to take part in a trial. A trial nurse or doctor would explain in detail what is involved, and you will receive full written information as well. You are free to decide whether to take part, and you can also withdraw at any time. If you can help, other patients in the future will benefit.

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 pre-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 prevent serious infections such as MRSA. You should use this on your body and hair.

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 water, and
- a time to stop drinking water. Please have a normal-size glass of water just 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.

Normal medicines

If you are asked to take your normal medicines, you can do so with a small sip of water at any time.

If you feel unwell on the day of your operation

You should phone the ward that is expecting you and ask for their advice.

Jewellery

It is best to leave most jewellery at home.

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 pre-assessment. They may listen to your chest and look in your mouth. They will ask you about any loose or crowned teeth.

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 can decide together which anaesthetic you will have.

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

Premedication

A 'pre-med' is a drug which is sometimes given shortly before an operation. You may be offered drugs to help with anxiety, to prevent sickness or to treat pain. You can ask your anaesthetist about having a pre-med if you want one.

Will my operation be cancelled?

Very occasionally, your anaesthetist may find something about your health which is not expected. They might recommend that your operation is delayed until the problem has been reviewed or treated. This will be discussed with your surgeon.

Getting ready for 'theatre'

Events will vary between hospitals.

Washing and changing

You will be able to use a shower if you want to. This will clean your skin and reduce the risk of infection.

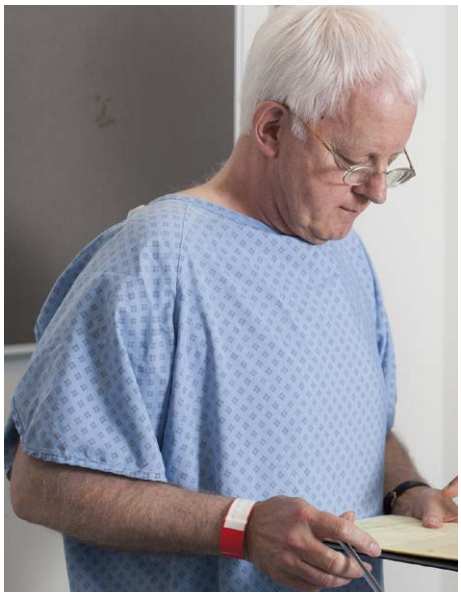
Make-up or body lotions are best avoided, as they prevent heart monitor pads and dressings from sticking properly. Please remove nail varnish and ask for advice about false nails.

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

You will be given a hospital gown to wear. You may like to wear your own dressing gown over this while you wait.

You will be given an identity bracelet to wear.

You can keep your pants on as long as they do not get in the way of the operation. Some hospitals provide paper pants.



Patient in a hospital gown

Patient is wearing surgical stockings

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 can form in your legs when you are lying very still during the operation.

Most patients will need to wear surgical stockings. Your nurses will measure your legs for these and help you get them on. They are very tight.

Personal items

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

Ideally you should remove jewellery and piercings. They may be damaged or get caught on things and injure you. If they cannot be removed, they will be covered with tape to try and prevent injury.

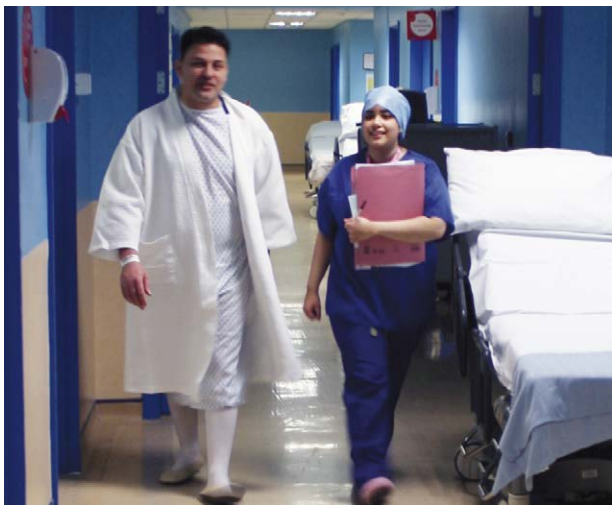
Waiting to go to theatre

There may be some waiting around before you go to theatre. Staff will try to keep this to a minimum. It is a good idea to bring something to do.

If the wait is longer than two hours, it may be possible for you to have some more water to drink. Ask your nurses for advice on this.

Going to theatre

Most people walk to the operating theatre. If you cannot walk far, a wheelchair may be used. If you have had a pre-med which makes you sleepy, you will go on a trolley or bed.



Patient walking to theatre with a member of staff

The operating-theatre department

The operating-theatre department includes the theatres and a recovery room. It is usually brightly lit and often has no natural light. Air conditioning may make it feel quite cold. 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.

In the anaesthetic room

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. These are compulsory safety checks that make sure you have the correct care.

In the anaesthetic room

Many hospitals do not have 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

Starting an anaesthetic

Several people will be there, including your anaesthetist and an ODP or anaesthetic nurse (see page 8). There may also be an anaesthetist in training, a nurse from the theatre team and other health professionals who are training.

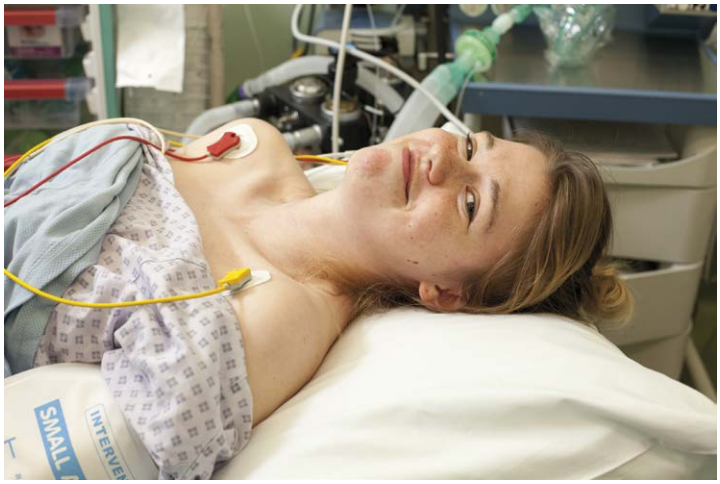
An important piece of equipment is the anaesthetic machine. You can see it on the left of this photograph. It delivers oxygen and anaesthetic gases in controlled amounts. This anaesthetic machine has the monitoring equipment on the upper shelf, above the gas controllers.

Monitors

The anaesthetist will attach you to monitoring equipment, which allows them to closely follow your wellbeing during your operation.

Heart monitor

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



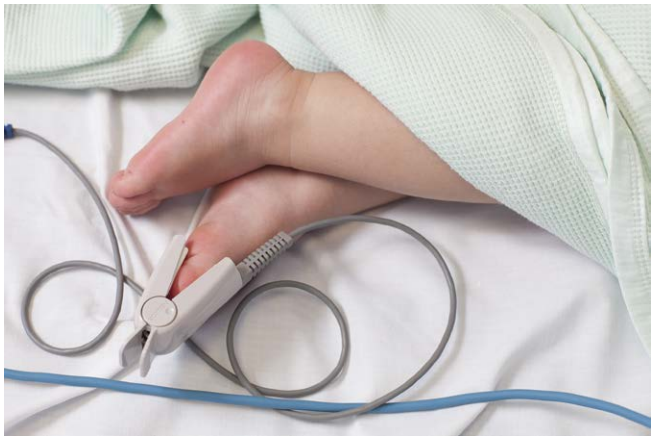
Sticky pads connect wires to the chest for monitoring the heart

Blood pressure

A cuff is placed around your arm which is usually set to read your blood pressure every five minutes or less.

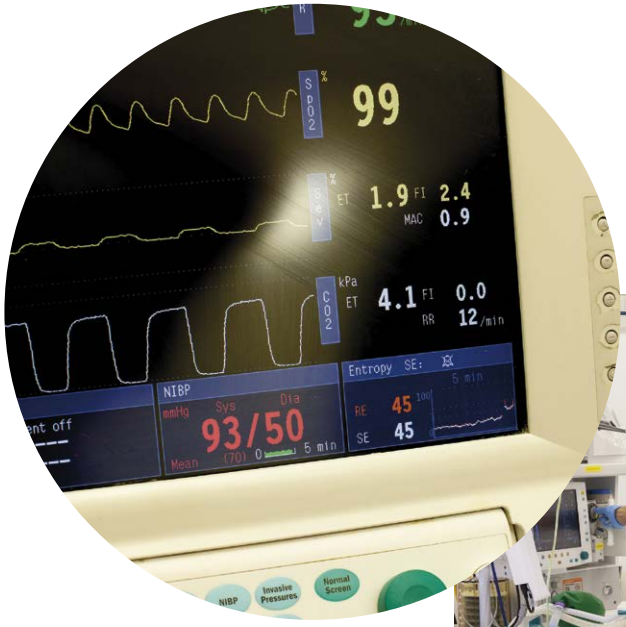
Oxygen levels

A peg with a red light inside it is placed on your finger or toe. This records your oxygen level continuously.



Oxygen level monitor on the finger or toe

Other monitors may be used for complicated 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 a vein. They will do this through a small plastic tube placed in the vein. This 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.

The anaesthetist will use a tourniquet (tight band) around the 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

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

Cannulas are colour coded by size

Sometimes, it can take more than one attempt to insert the cannula. You may be able to choose where your cannula is placed. Occasionally other sites are used, such as the foot.

Intravenous fluids – 'a drip'

You need to receive fluid during most operations, to prevent dehydration. This fluid may be continued afterwards until the time that you can drink normally. Your anaesthetist can give you sterile water with added salt or sugar through a drip into your cannula to keep the right level of fluids in your body. Any blood you need will also be given through the drip.

Cannula in place attached to tubing for fluid and drugs

A bag of fluid is attached to 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, but adults may have to ask for it, and it may not always be available.

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

Having a general anaesthetic

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

Many anaesthetists will 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.

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.

Child with Guedel airway

Intubated lady

In the operating theatre

When your anaesthetist is satisfied that your condition is stable, the monitors will be briefly disconnected and you will be taken into the theatre. Your anaesthetist will stay with you and will constantly be checking that you are responding well to the anaesthetic.

An anaesthetist watching the monitors during anaesthesia with the patient nearby

Compulsory checks

Before the operation begins, the whole team take a moment to make final checks on your care. The World Health Organization (WHO) recommends that these checks happen before every operation.

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

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 page 43.

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 into your cannula. The most commonly used is called propofol. It is a white liquid.
- Anaesthetic gases. There are several of these – the commonest in the UK are sevoflurane and isoflurane.

You will receive one of these continuously, to keep you unconscious as long as the operation lasts.

Pain relieving drugs

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

Drugs used during a general anaesthetic

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 they have worn off.

Other drugs

- **Antibiotics** to prevent infection.
- **Anti-sickness drugs**.
- **Paracetamol** 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 you as warm as possible. They will measure your temperature during the operation, and warming blankets are used if possible. For more information, please see the leaflet below:

www.rcoa.ac.uk/document-store/shivering

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.

Gel pad to protect the elbow

Preventing blood clots

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

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. Almost all types involve an injection. You will be awake for the injection unless you have asked to have sedation (see page 5).

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 about two hours.
- An epidural is when a needle is used to place a very fine tube (epidural catheter) in your back. '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 what they want you to do.

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

The injections are done in a very clean (sterile) way – just like an operation.

Anaesthetist cleaning his hands with iodine

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 more than one attempt to get the needle in the right place. 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.

Patient about to have spinal anaesthetic

You may notice a warm tingling effect as the anaesthetic starts to take effect. The anaesthetist will not let the operation begin until they are satisfied that the area is numb.

Most people feel well immediately after an operation with a spinal anaesthetic. This lady is in the recovery room with her recovery nurse. Also see photos on page 3 of this patient during her operation, and more information about the recovery room on page 31.

For more information, please see the leaflets below:

Your spinal anaesthetic
www.rcoa.ac.uk/document-store/your-spinal-anaesthetic

Epidural pain relief after surgery
www.rcoa.ac.uk/document-store/epidurals-pain-relief-after-surgery

Other types of regional anaesthetic

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

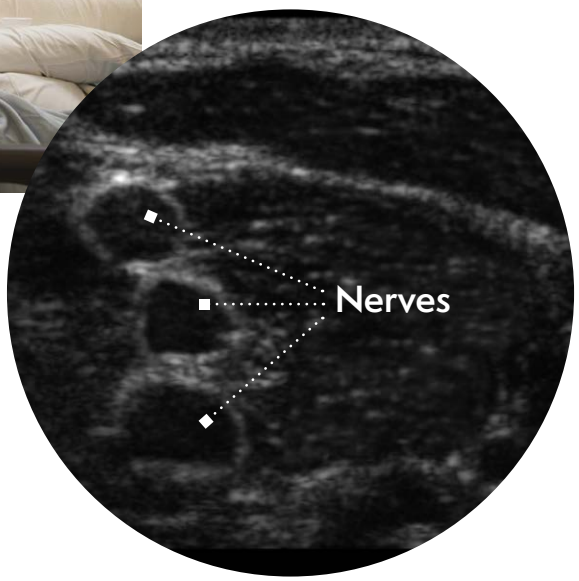
A nerve block is useful for:

- 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, but a general anaesthetic will always be needed as well.

Ultrasound guidance

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

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

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 below:

Nerve blocks for surgery on the shoulder, arm or hand
www.rcoa.ac.uk/document-store/nerve-blocks-surgery-the-shoulder-arm-or-hand

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 will move you across onto 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.

Surgery with a spinal anaesthetic

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 nerve block you have had.

During this time staff will 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 then you will feel the pain of the operation. You should tell staff immediately so they can give you some pain-relief medicine.

In the recovery room

After most anaesthetics you will be cared for in a recovery room. This is close to the operating theatre. Your surgeon or anaesthetist can quickly be told about any change in your condition.

Recovery room with child's mother present

Staff in the recovery room will either be nurses or 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 be returned to you.

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.

Recovery Room with child's mother present

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, please see the leaflet below:

Your anaesthetic for major surgery with planned high dependency care or intensive care afterwards
www.rcoa.ac.uk/document-store/your-anaesthetic-major-surgery-planned-high-dependency-care-or-intensive-care

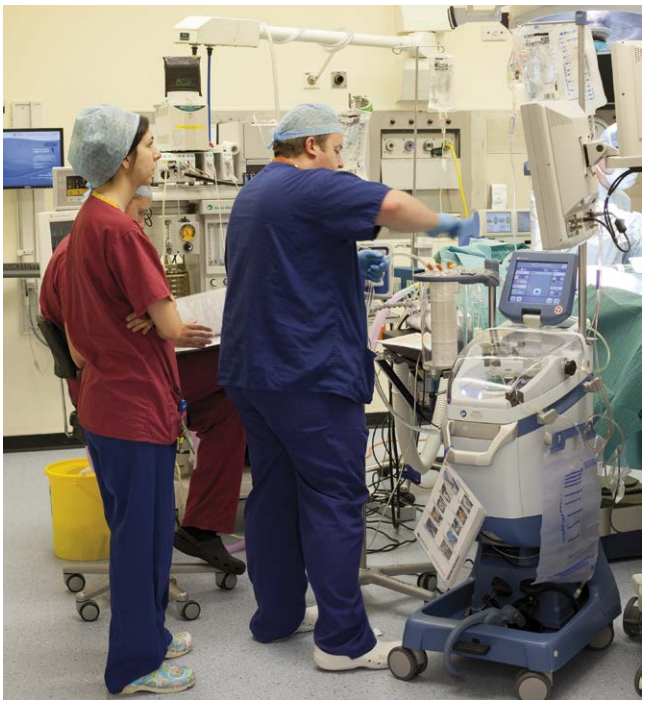
Blood transfusion

Blood is lost during most operations. The anaesthetist will give you salt-solution fluids through your cannula to make up for this. 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 saving'.

Your anaesthetist may also need to consider giving you a blood transfusion. You would receive blood from a volunteer blood donor under the rules of the National Blood Service. For more information about a blood transfusion, please see the information below:

www.nhs.uk/conditions/blood-transfusion/Pages/Introduction.aspx.

Cell saver in use



Pain relief

Good pain relief after your operation is important. As well as making you comfortable, it helps you get better more quickly.

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. 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 any preferences you have, 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 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 need to take these 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 it.

It is much easier to relieve pain if it is dealt with before it gets bad. So, you should ask for help if you think the pain is bad or getting worse.

Pain relief teams

Most hospitals have a team of nurses and anaesthetists who specialise in pain relief after surgery. You can ask to see them, or 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.

Tablets or liquids to swallow

These are used for all types of pain. They take 30 minutes to work and are best taken regularly. You need to be able to eat and drink without feeling 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 take 10 to 15 minutes to work.

Suppositories

These waxy pellets are placed in your rectum (back passage). The drug dissolves and is absorbed into the body, taking 10 to 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 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 in some of the ways listed – as a tablet or liquid to swallow, by an injection into a muscle, as a suppository, or into a vein. They can be used together as they belong to different chemical groups.

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 oxy-codone 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 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.

Your reaction to opiates will affect you considerably. 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 page 34) 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, and so works very quickly. You can continue to press the button at five-minute intervals until your pain is reduced to a suitable level. You can then have further doses to top up your pain relief as you need them, and 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 showing 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 on the lower body.

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 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 below:

Epidural pain relief after surgery
www.rcoa.ac.uk/document-store/epidurals-pain-relief-after-surgery

Pain relief at home

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

- You may be asked about pain-relief drugs that you already have at home, such as paracetamol. It is a good idea to stock up on pain-relief tablets before you come into hospital. Staff at the pre-assessment clinic will be able to advise you about which pain-relief drugs may be useful.
- If appropriate, you may be given a supply of pain-relief drugs to take home with you.

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.

Who can give me advice when I am at home?

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

- the nurse 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 tell you about anything significant that has happened. It is important to keep a note of this so you can tell an anaesthetist in the future.

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 40.

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

- worry before the operation
- 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.

Benefits and risks of having an anaesthetic

Anaesthesia has made modern surgery possible. Sophisticated operations can be offered 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 risk 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 illness
- personal factors such as whether you smoke or are overweight, and
- whether the operation is complicated, long, or done as an emergency.

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 those 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 effects of drugs or treatments which are unwanted, but are generally predictable and expected. 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.

Index of side effects and complications

The following index lists possible side effects and complications according to how likely they are to happen.

The folllowing scale shows what is meant in this booklet when a risk is described in words.

Very common	Common	Uncommon	Rare	Very rare
1 in 10 Someone in your family	1 in 100 Someone in a street	1 in 1,000 Someone in a village	1 in 10,000 Someone in a small town	1 in 100,000 Someone in a large town

For example, if something is 'very common' it means that about 1 in 10 people will experience it. It also means it will not happen to about 9 out of 10 people.

Using this index

The following index starts with 'very common' and 'common' side effects and finishes with 'rare' or 'very rare' complications.

RA = risk relevant to regional anaesthesia

GA = risk relevant to general anaesthesia

If you see the above symbol next to the item, it means you can find more detailed information about this risk on the website here: **www.rcoa.ac.uk/patientinfo**.

Very common and common risks

Feeling sick and vomiting **RA GA**

Some operations, anaesthetics and pain-relieving drugs are more likely to cause sickness than others. Anti-sickness drugs are routinely given with most anaesthetics and extra doses can be given to treat feeling sick (nausea) or vomiting.

Sore throat **GA**

For most general anaesthetics, the anaesthetist will place a tube in your airway to help you breathe. This can give you a sore throat. The discomfort or pain may last from a few hours to a few days. It is treated with pain-relieving drugs.

Dizziness and feeling faint **RA GA**

Anaesthetics can cause low blood pressure. Your anaesthetist will treat low blood pressure with drugs and fluid into your drip, both during your operation and in the recovery room. You will only go from the recovery room back to the ward when your blood pressure is stable.

Shivering **RA GA**

You may shiver if you get cold during your operation. Care is taken to keep you warm and to warm you afterwards if you are cold. A hot-air blanket may be used. Shivering can also happen even when you are not cold, as a side effect of anaesthetic drugs.

Headache RA GA

There are many causes of headache after an anaesthetic. These include the operation, dehydration, and feeling anxious. Most headaches get better within a few hours and can be treated with pain-relief medicines.

Severe headaches can happen after a spinal or epidural anaesthetic. If this happens to you, your nurses should ask the anaesthetist to come and see you. You may need other treatment to cure your headache.

Chest infection RA GA

A chest infection is more likely to happen after major surgery on the chest or abdomen, after emergency surgery and after surgery in people who smoke. It is treated with antibiotics and physiotherapy. In some circumstances, having an RA, rather than a GA, can reduce the risk of a chest infection. Occasionally severe chest infections develop which may need treatment in the intensive-care unit. These infections can be life-threatening.

Itch RA GA

This is a side effect of opiate pain-relief medicines. It can also be caused by an allergy to anything you have been in contact with, including drugs, sterilising fluids, stitch material, latex and dressings. It can be treated with drugs.

Aches, pains and backache RA GA

During your operation you may lie in the same position on a firm operating table for a long time. You will be positioned with care, but some people still feel uncomfortable afterwards.

Muscle pains can also happen if you receive a drug called suxamethonium. Your anaesthetist will tell you if you need this drug.

Pain when drugs are injected RA GA

Some drugs used for general anaesthesia or for sedation given with regional anaesthesia cause pain when injected.

Bruising and soreness RA GA

This can happen around injection and drip sites. It may be caused by a vein leaking blood around the cannula or by an infection developing. It normally settles without treatment other than removing the cannula.

Confusion or memory loss — GA

This is common among older people who have had a GA. It may be due to an illness developing such as chest or urine infection. There are other causes which the team looking after you will take care to treat. It usually recovers but this can take some days, weeks or months.

Bladder problems — RA GA

Difficulty passing urine, or leaking urine, can happen after most kinds of moderate or major surgery. If this happens, the team looking after you will consider whether you need a urinary catheter (soft tube) placed in the bladder, which drains the urine into a bag. If the difficulty is expected to get better very soon, it is best to avoid putting in a catheter if possible, because urine infection is more likely if you have a catheter. Your nurses will make sure that you are clean and dry as soon as possible. Most bladder problems get better, so that your normal urinary habit returns before you leave hospital.

Uncommon risks

Breathing difficulty — GA

Some people wake up after a general anaesthetic with slow or slightly difficult breathing. If this happens to you, you will be cared for in the recovery room with your own recovery nurse until your breathing is better.

Damage to teeth, lips and tongue — GA

Damage to teeth happens in 1 in 4,500 anaesthetics. Your anaesthetist will place a breathing tube in your throat at the beginning of the anaesthetic, and this is when the damage can happen. It is more likely if you have fragile teeth, a small mouth or a stiff neck. Minor bruising or small splits in the lips or tongue are common, but heal quickly.

Awareness — GA

Awareness is becoming conscious during some part of a general anaesthetic. It happens because you are not receiving enough anaesthetic to keep you unconscious. The anaesthetist uses monitors during the anaesthetic which show how much anaesthetic is being given and how your body is responding to it. These should allow your anaesthetist to judge how much anaesthetic you need.

If you think you may have been conscious during your operation, you should tell any member of the team looking after you. Your anaesthetist will want to know so they can help you at this time and with any future anaesthetic you may have.

Damage to the eyes — GA

It is possible that surgical drapes or other equipment can rub the cornea (clear surface of the eye) and cause a graze. This is uncomfortable for a few days but with some eye-drop treatment it normally heals fully. Anaesthetists take care to prevent this. Small pieces of sticky tape are often used to keep the eyelids together, or ointment is used to protect the surface of the eye. Serious and permanent loss of vision can happen, but it is very rare.

Nerve damage — RA GA

Nerve damage (paralysis or numbness) has a number of causes during local, regional or general anaesthetics. It varies with the type of anaesthetic you are having. Temporary nerve damage can be common with some types of anaesthetic, but full recovery often follows. Permanent nerve damage to nerves outside the spinal column is uncommon.

Existing medical conditions getting worse — RA GA

Your anaesthetist will make sure that any medical condition you have is well treated before your surgery. If you have previously had a heart attack or a stroke, the risk that you will have another one is slightly increased during and after your operation. Other conditions such as diabetes, high blood pressure and asthma will be closely monitored and treated as necessary.

Rare or very rare complications

Serious allergy to drugs — RA GA

Allergic reactions can happen with almost any drug. Your anaesthetist uses continuous monitoring which helps make sure that any reaction is noticed and treated before it becomes serious. Very rarely, people die of an allergic reaction during an anaesthetic. It is important to tell your anaesthetist about any allergies you know you have.

Damage to nerves in the spine — RA GA

Permanent damage to the nerves in your spine is very rare after either a general anaesthetic, spinal or epidural anaesthetics.

Equipment failure — RA GA

Many types of equipment are used during an anaesthetic. Monitors are used which give immediate warning of problems, and anaesthetists have immediate access to back-up equipment. The chance of a serious event due to equipment failure is rare or very rare.

Death

RA GA

If you are a healthy patient having non-emergency surgery, death from anaesthesia is very rare. An exact figure is not known, but it is around one death per 100,000 general anaesthetics.

You can find more information leaflets on the College website **www.rcoa.ac.uk/patientinfo**. The leaflets below may also be available from the anaesthetic department or pre-assessment clinic in your hospital.

- You and your anaesthetic (a shorter summary).
- Your spinal anaesthetic.
- Anaesthetic choices for hip or knee replacement.
- Epidural pain relief after surgery.
- Local anaesthesia for your eye operation.
- Your child's general anaesthetic.
- Your anaesthetic for major surgery.
- Your anaesthetic for a broken hip.
- Brachial plexus block for surgery and pain relief.

Royal College of Anaesthetists

Tell us what you think

We welcome suggestions to improve this leaflet.

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

Tel 020 7092 1500
Email patientinformation@rcoa.ac.uk
Website www.rcoa.ac.uk/patientinfo
Twitter @RCoANews | Find us on Facebook

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