

Patient information from the BMJ Group

Leg ulcers

In this section

[What is it?](#)

[What are the symptoms?](#)

[How is it diagnosed?](#)

[How common is it?](#)

[What treatments work?](#)

[What will happen?](#)

[Questions to ask](#)

Leg ulcers

Leg ulcers can be sore and stop you enjoying life. Some leg ulcers take a long time to heal, but almost all ulcers eventually get better.

Most leg ulcers heal within three to six months if they are treated. ^[1]

This information is for people who have a condition that doctors call **venous leg ulcers**. Here we don't look at how well these treatments work for people who have **diabetes** and get **diabetic foot ulcers**.

We've brought together the best research about leg ulcers and weighed up the evidence about how to treat them. You can use our information to talk to your doctor and decide which treatments are best for you.

What are leg ulcers?

A leg ulcer is a shallow sore on your lower leg that won't heal.

Leg ulcers sometimes start after a knock or bump breaks the skin on your lower leg. A wound can turn into a leg ulcer if it doesn't heal. This can happen if the blood flow to your legs is not good enough.

Doctors call these sores **venous leg ulcers**. Venous means the ulcer is caused by the **veins**. See [How veins in your legs work](#).

Older people are more likely than younger people to get a leg ulcer. You are also more likely to get one if: ^[2] ^[1]

- You have bad **arthritis** in your leg joints
- You have a heart condition called **heart failure**
- You have had a blood clot in your leg (**deep vein thrombosis**)
- You have had a leg ulcer before.

What are the symptoms of leg ulcers?

A leg ulcer is a shallow, moist wound in your lower leg that doesn't heal for at least six weeks. It could be anywhere from just below your ankle, to half way up your calf. But they are most likely on the inside of your ankle.

Leg ulcers can be small, big, or even stretch all the way around your leg. They shrink as they heal.

Your ulcer may look smooth, or it can be rough or bumpy. The bumps are called **granulation tissue**. If you have this bumpy tissue, that's usually good news. It shows your ulcer is healing. ^[2]

Ulcers are usually red or yellowish. They are often very sore. Simple painkillers such as paracetamol or ibuprofen can help with the pain.

You may also notice other symptoms: ^[2] ^[1] ^[3]

- Your legs ache or feel heavy, particularly towards the end of the day
- Your ankle or calf swells up
- The skin around your ulcer goes brown
- You get red, itchy, scaly skin, called venous eczema
- The ulcer weeps or oozes pus.

How common are leg ulcers?

Leg ulcers are very common in older people.

Overall, about 2 in every 1,000 people have a leg ulcer. But your chances of getting a leg ulcer increase as you get older. About 1 in 50 people over 80 have a leg ulcer. ^[4]

What treatments work for leg ulcers?

There are lots of different treatments for leg ulcers. If the first treatment you have doesn't work, there are others to try. Don't give up if it seems to take a long time. Most ulcers do heal up eventually.

Key points on treating leg ulcers

- Firm bandages or stockings around your lower leg are the best treatment for leg ulcers. They are called compression bandages and stockings.
- A simple non-stick dressing over your ulcer can help. We don't know if other types of dressings work any better.

Leg ulcers

- You could try the medicine pentoxifylline (Trental) if your ulcer is slow to heal with compression bandages or stockings alone.
- Wearing compression stockings can help to prevent you getting more ulcers in future.
- There are some things you can do yourself to help your ulcer to heal, such as putting your feet up whenever you sit down, keeping active, and being careful not to bump or knock your legs. To learn more, see [Self-help for leg ulcers](#) .

We've divided our information into treatments to help leg ulcers heal, and treatments to prevent leg ulcers.

- [Treatments to heal leg ulcers](#)
- [Treatments to prevent leg ulcers](#)

Treatment Group 1

Treatments to heal leg ulcers

We've looked at the best research and given a rating for each treatment according to how well it works. You can use this information to talk to your doctor and decide which treatment is right for you.

- Firm bandages called **compression bandages** work well to heal leg ulcers. **Compression stockings** can also help.
- A medicine called **pentoxifylline** (brand name Trental) can help if the bandages don't work on their own.
- If your ulcer won't heal with usual treatment, **artificial skin** grown in a laboratory might help.

Treatments to heal leg ulcers

Treatments that work

- [Compression bandages and stockings](#)
- [Pentoxifylline](#)

Treatments that are likely to work

- [Artificial skin](#)

Treatments that need further study

- [Special dressings](#)
- [Treatments to remove dead tissue](#)
- [Inflatable boots or leggings](#)
- [Surgery on varicose veins](#)
- [Skin grafts](#)
- [Suction](#)
- [Antibacterial pastes and dressings](#)
- [Laser treatment](#)
- [Ultrasound](#)

Other treatments

Compression bandages and stockings work well to heal leg ulcers. But doctors are always looking for new treatments to help ulcers heal faster. Most are still being tested. Others are not available in the UK, are very specialised, or are inconvenient or painful to use. We've listed them separately because doctors and nurses hardly ever use these treatments. But you might have heard about them.

- [Other medicines](#)
- [Biological treatments](#)
- [Injections to help wound healing](#)

Treatment Group 2

Treatments to prevent leg ulcers

We've looked at the best research and given a rating for each treatment according to how well it works. You can use this information to talk to your doctor and decide which treatment is right for you.

- Wearing compression stockings is the best way to avoid another leg ulcer.
- If you have varicose veins, an operation to treat them may help prevent another leg ulcer.

Treatments to prevent leg ulcers

Treatments that work

- [Wearing compression stockings](#)

Treatments that are likely to work

- [Surgery for varicose veins](#)

What will happen to me?

Ulcers can take a long time to heal. But your ulcer will almost certainly heal eventually.

If treatment goes well, your ulcer may heal in three months or less.^[5] But it can take much longer. About 4 in 5 ulcers need up to a year to heal.^[6]

The first treatment for most people is a simple dressing, covered with firm bandages. These are called **compression bandages** because they hold the leg firmly. Your doctor might also recommend **compression stockings**.

The bandages lower the pressure in your leg veins. This helps the blood flow, which in turn helps the ulcer to heal. If compression doesn't work, there are other treatments you can try, including medicines and surgery.

A nurse will probably come to treat your ulcer while you're at home. But you may need to go to a doctor's surgery, an ulcer clinic, or your local hospital for treatment. You won't need to stay in hospital, unless you are finding it hard to look after yourself at home. There are some things you can do to help your ulcer heal. For more information, see [Self-help for leg ulcers](#) .

If you find it hard to get around, you may feel quite isolated. Talk to your doctor or nurse. They may be able to put you in touch with local groups who can visit, or help you get out of the house.

Once you've had one ulcer, you have more chance of getting another one.^[3] Your chances of getting another ulcer within five years are about 1 in 3.^[7] But there are things you can do to avoid this. Wearing compression stockings is the best way to keep your legs healthy, if you've had an ulcer.^[8]

Treatments:

Compression bandages and stockings

In this section

There's good evidence that wearing compression bandages or stockings around your lower leg can help your ulcer to heal.

Leg ulcers

Bandages and stockings squeeze your leg. They relieve the pressure of blood in the veins. This brings down any swelling around your legs and ankles, and improves the blood flow in your veins. This should help your ulcer to heal. ^[12] ^[13]

Bandages are normally changed once a week by a nurse. The nurse can also show you how best to keep your leg up when resting.

Most bandages are elasticated (stretchy), although non-elastic bandaging can work just as well. ^[14] But non-elastic bandages have to be changed more often, because they get looser as the swelling in your leg goes down. ^[1]

Your bandages or stockings must be fitted correctly. If they are too loose, they won't work. If they are too tight, they could cut off the blood supply to your leg. Look out for your toes changing colour. If they go dusky or purple, your bandages may be too tight. ^[3] Your nurse can check the blood supply to your feet, using a small machine called a Doppler.

Compression bandages and stockings can cause other problems too. You might find: ^[15]
^[16] ^[17] ^[18]

- They hurt
- Your skin feels itchy or irritated
- You get some damage to your skin
- You have a skin reaction if you are allergic to something in the dressing or the covering.

If you are having problems with your bandages or stockings, talk to your nurse. You may need to have them a bit looser, or you might need a different type.

We found strong evidence to show that compression bandages work. ^[13] One high-quality study (called a randomised controlled trial) looked at 200 people with leg ulcers. ^[12] More than half the ulcers treated with four layers of bandages healed within three months, but only a third of ulcers without bandages healed.

Having three or four layers of bandages and padding may work better than just having a single layer of bandages. ^[13] ^[19]

Research shows compression stocking work at least as well as compression bandages. But we need more research to say whether one is better than the other. ^[13] ^[20] ^[21] ^[22]
^[23] ^[24]

Pentoxifylline

Leg ulcers

In this section

There's good evidence that this medicine can help your ulcer to heal, if [compression bandages](#) are not working on their own. But you'll need to keep wearing the bandages too.

Pentoxifylline is a medicine that you take by mouth. The brand name is Trental. You will need a prescription for this medicine. It improves the circulation of blood in your body, and helps your leg ulcer to heal. Your nurse or doctor may suggest you try pentoxifylline if compression bandages aren't working on their own.

But there are some side effects. The most common side effects are feeling sick, [diarrhoea](#), and indigestion. ^[25]

The research on this treatment is good. We found one summary of 12 studies, looking at 864 people in total, and two other high-quality studies. ^[25] ^[26] ^[27]

All the studies showed that pentoxifylline together with compression bandaging is better at healing ulcers than compression bandaging alone.

Artificial skin

In this section

There's some strong evidence to show that artificial skin can help your ulcer to heal.

Artificial skin is made in a laboratory, and contains human skin cells and collagen (a type of protein) from a cow. It's placed over your ulcer instead of a simple dressing. [Compression bandages](#) are then put on over the top. Artificial skin is a new and expensive treatment. It's only used for people whose ulcers won't heal with normal treatments.

There's good research showing that artificial skin made from two layers of skin cells heals ulcers faster than a simple dressing. ^[28]

We found one summary of two high-quality studies (called [randomised controlled trials](#)) with 345 people. In the biggest study, nearly two-thirds of the ulcers treated with artificial skin healed within six months, compared with less than half of the ulcers treated just with bandages. ^[29]

The studies didn't mention any side effects. But artificial skin contains animal products, so some people may not want to have this treatment. ^[30]

Special dressings

In this section

We don't know if special dressings work any better than simple non-stick dressings. There hasn't been enough research on the different types. ^[31] ^[32] ^[33] ^[34] ^[35]

Leg ulcers

Dressings are placed directly over your ulcer to protect it and keep it moist while it heals. Most people have a simple dressing such as paraffin gauze or knitted viscose.

But there are many other types of dressings, some with added features to help soak up any excess pus. These are sometimes called **interactive dressings**. Here are some examples:

- Foam dressings that come as a sheet, or as a liquid that spreads out to fill your leg ulcer
- Alginate dressings, made from seaweed
- Clear film dressings
- Hydrocolloid dressings. These are meant to soak up excess moisture from your ulcer.

The research we looked at showed that special dressings worked no better than simple dressings.^{[31] [32] [33] [34] [35]} Also, special dressings can cause pain, infection, an allergic reaction, rash, and an unpleasant smell. These dressings can also damage the skin if they need to be changed regularly.

We don't really know what type of dressing is best. But experts agree that the type of dressing on your ulcer is much less important than the [compression bandaging](#) that goes over it.

Guidelines for doctors and nurses in the UK recommend using simple dressings wherever possible. Non-stick dressings don't damage the skin underneath your ulcer.^{[36] [37]}

You need to be careful when you use dressings that contain paraffin as these can catch fire easily.^[38] Don't smoke or use a naked flame when using these type of dressings. And change your clothes and bedding regularly, as the paraffin can seep into these fabrics.

Treatments to remove dead tissue

In this section

We don't know whether it's worth having extra treatment to remove dead tissue. There hasn't been enough good-quality research to say whether it helps.

It's important to keep your ulcer clean. A gentle wash with warm tap water is usually enough to remove any pus or dead tissue.

But sometimes doctors and nurses use other treatments to get rid of the dead tissue. This is called [debridement](#). Doctors and nurses often do this by gently scraping away

Leg ulcers

the dead tissue with a knife or scalpel. Sometimes they use other methods. These include:
[\[39\]](#)

- Dressings designed to remove the dead tissue
- A chemical called iodine
- Chemicals called **enzymes** that dissolve dead tissue.

We found two summaries of studies testing these methods. [\[39\]](#) [\[40\]](#) But there were problems with the studies. This means we can't rely on the results, so we don't really know if these methods work.

Maggots can also be used to remove dead tissue from leg ulcers. For more information, see [Maggot treatment for leg ulcers](#) .

Inflatable boots or leggings

In this section

Some doctors recommend wearing inflatable boots or leggings, but we don't know if this can help your ulcer to heal. There's not enough good-quality research.

You wear special boots or leggings which are inflated by a pump. They squeeze your lower leg, improving the blood flow in your veins. They can be used instead of, or on top of, normal [compression bandages](#) .

You can have this treatment at home, at a clinic, or in hospital. You might find it less convenient than compression bandages, because you have to stay still for several hours a day.

We found four studies testing this treatment. But they were all too small to be reliable. So we don't really know if this treatment works. [\[42\]](#)

Surgery on varicose veins

In this section

Varicose veins make you more likely to get a leg ulcer. But we don't know if having surgery on your varicose veins can help an ulcer to heal. Most doctors won't operate until your ulcer has healed.

Having varicose veins removed is quite a common operation. But having any sort of surgery means you run the risk of surgical complications, like infection or bleeding.

You might have a **general anaesthetic** , so you're asleep during the operation. Or you might just have a **local anaesthetic** , where the part of the body being operated on is

Leg ulcers

made numb. For more information on operations for varicose veins, see [Surgery for varicose veins](#) .

You will need to wear [compression stockings](#) afterwards, probably for the rest of your life.

We found several studies looking at surgery for varicose veins. The studies seemed to show that surgery is no better than [compression bandages](#) for helping an ulcer to heal. ^[43] ^[44] ^[45] ^[46] ^[47] But we still need more research to know for certain.

There is some good evidence that an operation can stop you getting more ulcers in future. See [Treatments to prevent leg ulcers](#) .

Skin grafts

In this section

Your nurse or doctor may suggest you have a skin graft, if your leg ulcer is very big or just will not heal. But more studies are needed to know whether or not this treatment works.

Skin grafts are patches of healthy skin placed over your ulcer. Some skin grafts cover the ulcer. Others start small and grow to cover the area. These are called **pinched skin grafts**.

Doctors take the skin from a healthy part of your leg, usually your thigh. Pinched skin grafts can usually be done by nurses in a clinic. But you'll need to go to hospital for bigger skin grafts. They leave a deep graze in your thigh, which can be very sore. You may need to take painkilling medicine afterwards.

You'll need to carry on wearing [compression bandages](#) after your treatment.

One study involving 120 people found that more people who had a skin graft had a healed ulcer after 12 weeks compared with people who were treated with just a compression bandage. ^[48] But a summary of 17 studies couldn't say whether skin grafts helped to heal ulcers because the studies were mostly small and not very good. ^[28] More research is needed.

Suction

In this section

If your leg ulcer is oozy or weepy, you can keep it clean by removing extra liquid through a suction pump. But there's not enough evidence to show if this can help your ulcer to heal.

You need a special dressing including a suction tube and a pump. The equipment is quite bulky, so this treatment can be inconvenient.

Leg ulcers

We found two studies. One found that suction helped ulcers to heal more quickly.^[49] But the second study was too small to be useful.^[50] More research is needed to say whether or not suction works.

Antibacterial pastes and dressings

In this section

Antibacterial pastes and dressings are treated with chemicals that kill bacteria. They are designed to prevent infection in your leg ulcer.

Here are some examples of antibacterial pastes and dressings:^[51]

- Povidone-iodine
- Cadexomer-iodine
- Polynoxylin paste
- Dressings infused with silver.

We don't know if antibacterial pastes or dressings work any better than simple dressings. There's little good research. Only one study we found showed that antibacterial dressings helped more than ordinary dressings.^[52] Three summaries of the research, which looked at 27 studies altogether, and three other studies all found that these pastes and dressings didn't help.^{[51] [53] [54] [55] [56]} But many of the studies were small and not very good quality.

Another summary found some evidence that cadexomer-iodine may help ulcers to heal faster, but we need more research to know for certain.^[57]

Some pastes and dressings can irritate your ulcer or the skin around it.

Other medicines

In this section

Your body has its own ways of healing wounds. Scientists have tested various medicines designed to help the healing process along, including aspirin, zinc supplements, and chemicals called rutosides.

Only two medicines look promising so far. They are called sulodexide and flavonoids. Both are taken while you continue to wear compression bandaging. They are taken as tablets. Sulodexide can also be injected. But sulodexide and flavonoids aren't available in the UK.

Leg ulcers

We found one summary of the research on flavonoids (called a **systematic review**) and four high-quality studies (called **randomised controlled trials**) testing sulodexide. The summary found that flavonoids taken while wearing compression bandages may help ulcers heal faster than compression bandages on their own. But the quality of the studies was not very good. Without better-quality studies, we can't be certain that flavonoids are helpful.^[58] All the studies on sulodexide found that taking this medicine helped leg ulcers to heal faster than using compression bandaging alone.^{[59] [60] [61] [62]}

Biological treatments

In this section

Biological treatments use biological compounds that are produced naturally by your body. Most are part of your body's natural wound healing process. They are applied directly to your ulcer, sometimes in a dressing. There's not enough good evidence to show whether they work.^{[63] [64] [65] [66] [67]}

Here's a list of some of these biological compounds:

- Freeze-dried keratinocyte lysate
- Keratinocyte growth factor 2
- Mesoglycan
- Platelet-derived growth factor (PDGF).

Injections to help wound healing

In this section

One small study suggests that having injections around your leg ulcer can stimulate healing. The injections contain a substance that takes part in the normal process of healing. It's called granulocyte-macrophage colony stimulating factor (GM-CSF). But this treatment is likely to hurt, and can make you feel unwell.^[68] It is not widely available in the UK.

Ultrasound

In this section

Ultrasound waves are sound waves too high-pitched for us to hear. Low levels of ultrasound waves are sometimes used to treat leg ulcers. But we don't know how ultrasound affects healing.

Leg ulcers

We found one summary of eight studies, which suggested that ultrasound might help. But the studies were too small to be reliable.^[69] A larger study with 337 people suggested low-level ultrasound doesn't help.^[70] But we still need more research to know for certain.

Laser treatment

In this section

Lasers are high-energy beams that generate heat and light. Weak lasers can be used to treat leg ulcers. But we don't know whether they help with healing. The studies of this treatment have had mixed results.^{[71] [72] [73] [74] [75] [76] [77]}

Wearing compression stockings

In this section

Once your ulcer has healed, wearing compression stockings will help to stop you getting another one.^{[78] [8]}

Compression stockings are stockings that fit firmly around your legs. They help improve your blood flow and stop blood pressure building up in your veins.

You need to wear compression stockings for at least five years. You may need to wear them for the rest of your life. Your nurse will tell you where to get them and how to use them properly.

There is good evidence to show that compression stockings are the best way to stop you getting leg ulcers in future. One high-quality study (called a [randomised controlled trial](#)) looked at 153 people. It showed only one fifth of the people who wore stockings got another ulcer, compared with nearly half of the people who did not.^[8]

Surgery for varicose veins

In this section

There's some good evidence to show that having surgery on your varicose veins might stop you getting another leg ulcer.

Many people who have leg ulcers also have varicose veins. Once your ulcer has healed, an operation to remove your varicose veins might help to stop you getting another ulcer.

We found three good-quality studies.^{[79] [80] [81]} All of the studies showed that having vein surgery, and wearing [compression stockings](#) afterwards, is better at preventing ulcers than simply wearing compression stockings. In the biggest study, which looked at 428 people, 12 in 100 of the people who had surgery got another ulcer within a year, compared with 28 in 100 of those who didn't have surgery.^[81]

Leg ulcers

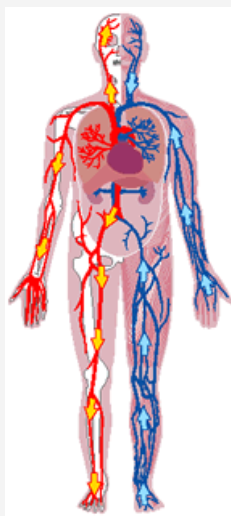
Having varicose veins removed is quite a common operation. But there are risks with any sort of surgery, such as **infection** or bleeding.

You might have a **general anaesthetic**, so you're asleep during the operation. Or you might have a **local anaesthetic**, where the part of the body being operated on is made numb. For more information, see [Surgery on varicose veins](#).

You will need to wear compression stockings afterwards. You'll probably have to wear them for life.

Further informations:

How veins in your legs work



Your veins (in blue) take blood back to your heart.

Veins are the tubes (blood vessels) that carry blood to your heart.

Other tubes called arteries carry blood away from your heart and around your body.

The blood enters your veins once it has delivered oxygen and food to cells in your body. Usually, the veins expand and tighten (contract) to let different amounts of blood pass through them.

Wounds need a good flow of blood to heal. If your blood is not flowing properly, your wound doesn't get enough oxygen and food to help it heal.

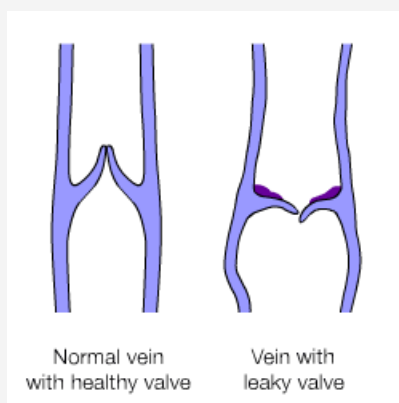
Blood flow in your legs relies on your veins carrying blood back uphill from your feet to your heart.

The veins can do this because they have one-way flaps, called **valves**, which stop the blood flowing back down into the legs.

Leg ulcers

When you walk, the action of muscles in your legs squeezes the blood uphill.

But sometimes your veins have trouble doing this. This might happen if: ^[2]



- You have **varicose veins**. This means the one-way flaps in your veins don't work properly. So blood pools in your legs and it's harder for your body to pump it back to the heart (To learn more, see [Varicose veins](#) .)
- You don't do much exercise. Walking exercises your leg muscles and helps squeeze the blood uphill
- You're overweight.

If your blood flow is not good, the blood pressure in your leg veins builds up and gets too high. Once you have high pressure in your leg veins, getting even a small break in the skin can quickly lead to a leg ulcer.

Self-help for leg ulcers

There are some things you can do to help your ulcer heal. We haven't looked at the evidence for these things, in the way we do for the other treatments. But they are recommended in guidelines for doctors and nurses. ^{[9] [10] [11]}

- Put your feet up whenever you sit down. This helps blood flow, and stops pressure building up in your leg veins. Try to lie down with your feet above the level of your chest for half an hour, three or four times a day. ^[1]
- Keep active when you're not resting with your legs up. Walking is a good way to exercise your leg muscles and improve blood flow in your leg veins.
- Raise the foot of your bed slightly. This will help the blood flood and stop pressure building up in your leg veins when you're asleep.

Leg ulcers

- Be careful not to bump or knock your legs. You might break the skin and get another ulcer.
- Eat a healthy balanced diet, so your body is getting the nutrients it needs.
- Try to stop smoking. Smoking can make it harder for your body to heal wounds.
- Try to lose weight, if you are overweight. You're more likely to have problems with blood flow if you are overweight.

Maggot treatment for leg ulcers

You may not like the sound of having maggots on your skin, but this treatment is becoming more popular.

Maggots are used to clean leg ulcers because they eat dead tissue, without harming healthy tissue. They come in a small sterile pack, a bit like a teabag, or from a sterile jar. The nurse or doctor puts them on your ulcer under a light bandage, and leaves them for a few days to clean up. Then they simply wash off.

There hasn't been much research on using maggots for leg ulcers. One study with 267 people found that those treated with maggots didn't heal any faster than those treated with a standard dressing. However, people who had maggots reported more pain. ^[41]

You can't wear [compression bandages](#) while the maggots are working because they would get squashed.

Glossary:

diabetes

Diabetes is a condition that causes too much sugar (glucose) to circulate in the blood. It happens when the body stops making a hormone called insulin (type 1 diabetes) or when insulin stops working (type 2 diabetes).

veins

Veins are blood vessels that carry blood back to your heart after your blood has delivered oxygen and food to the tissues.

arthritis

Arthritis is when your joints become inflamed, making them stiff and painful. There are different kinds of arthritis. Osteoarthritis is the most common type. It happens when the cartilage at the end of your bones becomes damaged and then starts to grow abnormally. Rheumatoid arthritis happens because your immune system attacks the lining of your joints.

heart failure

When the heart loses its ability to push enough blood through the blood vessels, it is called heart failure.

deep vein thrombosis

A deep vein thrombosis is a blood clot that has formed in the deep veins of your arms or legs. These clots can form if a person doesn't move their limbs often enough. This is because blood is pushed through your veins by the contraction of muscles that occurs when a limb is moved. Blood tends to clot when it is not kept flowing, so clots can form if a person is not moving. Deep vein thrombosis is also called deep venous thrombosis or DVT.

valve

Leg ulcers

A valve is a piece of tissue, located in a tube or passageway in your body, that keeps materials or fluid flowing in one direction, by preventing them from flowing backwards. There are valves in your veins, for example, which keep blood flowing towards your heart and stop blood from flowing back away from your heart.

randomised controlled trials

Randomised controlled trials are medical studies designed to test whether a treatment works. Patients are split into groups. One group is given the treatment being tested (for example, an antidepressant drug) while another group (called the comparison or control group) is given an alternative treatment. This could be a different type of drug or a dummy treatment (a placebo). Researchers then compare the effects of the different treatments.

diarrhoea

Diarrhoea is when you have loose, watery stools and you need to go to the toilet far more often than usual. Doctors say you have diarrhoea if you need to go to the toilet more than three times a day.

debridement

Debridement is the way in which a doctor or nurse cleans away the damaged surface of your wound or ulcer.

enzymes

Enzymes are chemicals in your body. They have lots of different functions, including playing a part in helping to digest food and starting other chemical reactions that keep the body working.

general anaesthetic

You may have a type of medicine called a general anaesthetic when you have surgery. It is given to make you unconscious so you don't feel pain when you have surgery.

local anaesthetic

A local anaesthetic is a painkiller that's used to numb one part of your body. You usually get local anaesthetics as injections.

bacteria

Bacteria are tiny organisms. There are lots of different types. Some are harmful and can cause disease. But some bacteria live in your body without causing any harm.

systematic reviews

A systematic review is a thorough look through published research on a particular topic. Only studies that have been carried out to a high standard are included. A systematic review may or may not include a meta-analysis, which is when the results from individual studies are put together.

infection

You get an infection when bacteria, a fungus, or a virus get into a part of your body where it shouldn't be. For example, an infection in your nose and airways causes the common cold. An infection in your skin can cause rashes such as athlete's foot. The organisms that cause infections are so tiny that you can't see them without a microscope.

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