

# Amputation Explained





## CONTENTS

About Amputation	03
How Common Are Amputations?	03
General Causes Explained	04
Outlook	06
Complications of Amputation	06
Psychological Impact of Amputation	07
Lower and Upper Limb Amputations	09
How an Amputation is Performed	10
Pre-Operative Assessment	10
Surgery	11
Recovering from Amputation	12
Going Home	15
Contact Us	16

## About Amputation

This leaflet is part of a series produced by Blesma for your general information. It is designed for anyone scheduled for amputation or further amputations, but is useful for anyone who has had surgery to remove a limb or limbs, or part of a limb or limbs. It is hoped that this information will allow people to monitor their own health and seek early advice and intervention from an appropriate medical practitioner. Any questions brought up by this leaflet should be raised with a doctor.

## How Common Are Amputations?

**Between 5,000 and 6,000 major limb amputations are carried out in the UK every year.**

The most common reason for amputation is a loss of blood supply to the affected limb (critical ischemia), which accounts for 70 per cent of lower limb amputations. Trauma is the most common reason for upper limb amputations, and accounts for 57 per cent.

People with either Type 1 or Type 2 diabetes are particularly at risk, and are 15 times more likely to need an amputation than the general population. This is because diabetes leads to high blood glucose levels that can damage blood vessels, leading to a restriction in blood supply.

More than half of all amputations are performed in people aged 70 or over, while men are twice as likely to need an amputation as women.

# General Causes Explained

## Peripheral Arterial Disease (PAD)

PAD is a common condition in which a build-up of fatty deposits in the arteries (atherosclerosis) restricts blood supply to leg muscles. In some cases, a complication called critical limb ischemia (CLI) can occur in one or both legs. This is where blood flow to the legs becomes severely restricted.

### Symptoms of CLI can include:

- severe burning pain in the legs and feet, even when resting
- the skin becoming cold, pale, shiny, smooth and dry
- wounds and ulcers (open sores) on the legs and feet that don't heal
- the leg muscles begin to waste away
- skin changing colour from red to brown to purple or black (gangrene)

CLI can sometimes be treated using an angioplasty or bypass graft to restore blood flow to the affected leg. These are more likely to be successful if carried out early.

However, even if these techniques are an option, they aren't always successful and the patient may still need to have an amputation.

## Diabetes

Diabetes is a lifelong condition that causes a person's blood sugar level to become too

high. Diabetes sufferers' high blood sugar levels can damage nerves (peripheral neuropathy) and blood vessels – particularly those in the feet. Nerve damage can reduce the sensation in the feet, meaning injuries and foot ulcers can develop without the patient realising. Blood vessel damage can also reduce the blood supply to the feet, meaning ulcers take longer to heal and are more likely to become infected.

These infections can spread rapidly through the foot and up the leg, and an amputation may be necessary to prevent it spreading further. Therefore, it's very important to seek help early to prevent amputation.

## Gangrene from a Diabetic Foot Ulcer

A diabetic foot ulcer is an open sore that develops on the feet of people with diabetes. High blood sugar causes damage to the nerves (peripheral neuropathy) and the blood vessels, particularly in the feet.

Therefore, the reduced sensation of the nerves means the patient is more likely to develop an ulcer, and the reduced blood supply means the ulcer is more likely to become infected. The infection is likely to further restrict blood supply, leading to gangrene (decay and death of body tissues).

Once gangrene has developed, it is sometimes necessary to amputate the affected limb to prevent the spread of infection and further damage to healthy tissue.

## Atherosclerosis

Atherosclerosis is a potentially very serious condition that worsens over time. The body's arteries become clogged by fatty substances such as cholesterol. People are more likely to get atherosclerosis if they smoke, if they are obese or if they have high cholesterol or high blood pressure.

Many people with atherosclerosis go on to develop a condition called peripheral arterial disease (see above left), which occurs when there is a blockage in the arteries of the limbs (in most cases, the legs). In the most severe cases of peripheral arterial



disease, the blood supply to the lower limbs becomes blocked, leading to gangrene, which may require revascularisation (restoration or improvement of blood supply) or amputation.

### Trauma

**Amputation may be necessary if a limb is severely injured. Examples of injury include:**

- **crush injuries** eg. as a result of a car crash
- **blast injuries** eg. those experienced by soldiers wounded by explosive devices
- **avulsion injuries** where a body part is torn from the body (eg. from a dog bite)
- **guillotine injuries** where a limb, or part of a limb is cut entirely or almost entirely away from the body
- **severe burns** including chemical burns

### Less common reasons

**Some of the less common reasons for amputation include:**

- **cancers** that develop inside the skin or bone of a limb, such as osteosarcoma (a type of bone cancer) or malignant melanoma (a type of skin cancer)
- **infections** such as an infection of the bone (osteomyelitis) or necrotising fasciitis (a serious type of bacterial skin infection sometimes referred to as flesh-eating bacteria)
- **Buerger's disease** is a rare condition in which blood vessels supplying the hands, arms, feet and legs become swollen and blocked, which can sometimes lead to gangrene and infection

# Outlook

## The outlook for people with an amputation often depends on:

- **Age:** Younger people tend to cope better with the physical demands of adjusting to life with an amputation
- **How much of the limb was removed:** If less of the limb is removed there will be a greater range of movement in the prosthetic limb
- **How well they cope with the emotional and psychological impact of amputation:** Many people who have had an amputation have reported feeling emotions such as grief and bereavement, similar to experiencing the death of a loved one. A 'phantom limb' – where a person experiences the sensation of the limb still being attached to their body, often causing pain, is also a common complication following an amputation

# Complications of Amputation

There are a number of factors that influence the risk of complications from amputation, such as a patient's age, the type of amputation and their general health.

The risk of serious complications is higher in planned amputations than in emergency amputations. This is because most planned amputations involve the leg and are carried out on older people with a restricted blood supply, who are in a relatively poorer state of health and who usually have a chronic (long-term) health condition, such as diabetes. Most emergency amputations involve the arm and tend to be carried out on younger people who are usually in a better state of health.

## Complications from amputation include:

- **heart complications** such as heart attack or heart failure (when the heart has difficulty pumping blood around the body)
- **blood clots** (venous thrombosis)
- **infection at the site of the surgery**
- **pneumonia** (infection of the lungs)
- **further surgery being required**

Due to the relatively high risk of complications, a planned amputation is seen as a 'treatment of last resort'. It is only used when there is no other way of preventing life-threatening and serious symptoms, such as gangrene, from developing.

# Psychological Impact of Amputation

Loss of a limb can have a considerable psychological impact. Many people who have had an amputation report feeling emotions such as grief and bereavement, similar to experiencing the death of a loved one.

Coming to terms with the psychological impact of an amputation is often as important as coping with the physical demands.

## Having an amputation can have an intense psychological impact for three main reasons:

- Coping with the loss of sensation from the amputated limb
- Coping with the loss of function from the amputated limb
- Coping with your own, and other people's, perception of body image

It is common to experience negative thoughts and emotions after an amputation. This is especially true in people who experience an emergency amputation, as they did not have time to mentally prepare themselves for the effects of surgery.



## Common negative emotions and thoughts experienced by people after an amputation include:

- **depression**
- **anxiety**
- **denial** (refusing to accept they need to make changes, such as having physiotherapy, to adapt to life with an amputation)
- **grief** (a profound sense of loss/bereavement)
- **suicidal feelings**

Amputees should talk to their care team about their thoughts and feelings, especially if they are feeling depressed or suicidal. They may require additional treatment, such as antidepressants or counselling, to improve their ability to cope with living with an amputation.

People who have had an amputation due to trauma (especially members of the Armed Forces who are injured while serving on operations) have an increased risk of developing post-traumatic stress disorder (PTSD). Those suffering from PTSD experience a number of symptoms after a traumatic event, such as anxiety and a feeling that they are 'reliving' the event.



# Lower and Upper Limb Amputations

## LOWER LIMB AMPUTATIONS

The most common type of major amputation, accounting for more than half of all cases in the UK, is a type of lower limb amputation known as transtibial amputation. This is where the bottom section of a leg is amputated beneath the knee. A transtibial amputation is also known as a below-knee amputation.

### Other types of lower limb amputation, in order of how common they are in the UK:

- **Lower digit amputation:** one or more of the toes is amputated
- **Transfemoral amputation:** both the bottom half of the leg and part of the thigh above the knee are amputated. Also known as an above-knee amputation
- **Double lower amputation:** both legs are amputated, usually below the knee
- **Knee disarticulation:** the amputation is performed through the knee joint
- **Partial foot amputation:** the toes and lower half of the foot are amputated
- **Hip disarticulation:** the amputation is performed through the hip joint, removing the entire leg
- **Hemipelvectomy:** an entire leg and a section of the pelvis are amputated (the rarest type of lower limb amputation, usually reserved for the most serious and extensive cases of damage to the limb)



## UPPER LIMB AMPUTATIONS

Most upper limb amputations are needed because the hand and arm have been damaged by a traumatic injury.

### The main types of upper limb amputation, listed in order of how commonly they are performed in the UK:

- **Upper digit amputation:** the thumb or one or more of the fingers is amputated
- **Transhumeral amputation:** the hand and a section of the arm are amputated above the elbow
- **Transradial amputation:** the hand and a section of the arm are amputated below the elbow
- **Partial hand amputation:** a section of the hand is amputated
- **Shoulder disarticulation:** the amputation occurs through the shoulder joint, removing the entire arm
- **Double upper amputations:** both hands and some of the arms are amputated
- **Forequarter amputation:** the entire arm is amputated along with a section of the shoulder blade and collar bone
- **Wrist disarticulation:** amputation occurs through the wrist joint, removing the hand
- **Elbow disarticulation:** amputation occurs through the elbow joint, removing the hand, wrist and forearm

# How an Amputation is Performed

## The Care Team

Carrying out an amputation, and then helping the patient adjust to life, is a complex job that requires a team of different healthcare professionals, each with their own area of expertise. These sorts of teams are known as Multi-Disciplinary Teams (MDTs).

### Members of an MDT may include:

- a **surgeon**
- a **nurse** who specialises in providing pain relief
- a **psychologist** (a health professional who specialises in mental health)
- a **social worker**
- a **pharmacist**
- a **prosthetist** (a specialist in prosthetic limbs)
- a **dietitian** (a specialist in diet and nutrition)
- a **physiotherapist** (a therapist who can help improve range of movement and coordination)
- an **occupational therapist** (a therapist who can help improve the skills and abilities needed for daily activities such as washing or dressing)
- **Blesma** (to offer support available as described in the first in this series of leaflets)

# Pre-Operative Assessment

Unless an amputation is performed as an emergency, the patient will probably undergo a number of tests and procedures before the amputation takes place. These tests are designed to assess the type of amputation suitable for the patient, along with anything that may affect their rehabilitation.

### These tests and procedures may include:

- a **thorough medical examination**, including assessing the patient's physical condition, nutritional status, bowel and bladder function and the various systems of the body, such as the cardiovascular system (heart, blood and blood vessels) and respiratory system (lungs and airways)
- an **assessment of the condition and function of the healthy limb**. Removing one limb can place extra strain on the remaining limb, so it is important to reduce any potential risk of amputation of the remaining limb at a later date
- a **psychological assessment** to determine how well the patient will cope with the psychological and emotional impact of amputation, and whether they will require additional support
- an **assessment of the patient's home, work and social environments** to determine whether any additional provisions will need to be made to help them cope

After the pre-operative assessment, the surgeon should be able to inform the patient of the type of amputation needed.

At this stage, the patient will also be introduced to a physiotherapist, who will be involved in their post-operative care and, if necessary, a prosthetist (a specialist in prosthetic limbs) who will explain more about the type and function of prosthetic limbs (or other devices) available.

**Things that will influence the type of prosthetic limb recommended include:**

- **the type of amputation**
- **the amount of muscle strength in the remaining section of the limb**
- **the patient's general state of health**
- **tasks the prosthetic limb will be expected to perform**, such as whether the patient has a desk or manual job, and what type of hobbies they have
- **whether the patient wants the limb to look as physically real as possible** or whether they are more concerned with being able to use the limb for a wide range of activities

The patient may have to decide between having a prosthesis that is physically realistic or one that is functionally useful. However, it is possible to have a prosthetic limb that is both physically realistic and fully (or mostly) functional.

Many people planning to have an amputation find it both reassuring and useful to talk to somebody who has gone through a similar type of amputation. A member of the care team may be able to put the patient in touch with someone suitable.



An amputation is carried out under a general anaesthetic or an epidural anaesthetic, so no pain is felt during surgery.

Ideally, as much of the limb as possible should be spared as this will mean a greater range of movement and functional ability in the prosthetic limb.

A number of additional techniques can be used during surgery to help improve the remaining limb function and reduce the risk of complications.

**These include:**

- **shortening and smoothing the bone** in the remaining limb so it is covered by an adequate amount of soft tissue and muscle
- **stitching the remaining muscle to the bones** to help strengthen the remaining limb

After the amputation, the remaining stump wound is sealed with stitches or staples.

**Note:** Leaflets 3 and 5 give more information on prosthetic fitting and stump care, as well as a guide to the NHS Limb Service.

# Recovering from an Amputation

After surgery, the patient is transferred back to a ward. They will normally be given oxygen through a mask, and nutrients and fluids through a drip for the first few days.

The amputation wound will be covered with a bandage or plaster dressing, and a tube may be placed under the skin next to the wound to drain away any excess fluid. This will help prevent excessive bruising and swelling at the wound. It is usually recommended that the bandage remains in place for the first five days to minimise the risk of infection.

A small, flexible tube, known as a urinary catheter, may be placed in the bladder during surgery to drain away urine. This means the patient will not need to worry about going to the toilet for the first few days after surgery.

It is likely that considerable pain will be experienced at the site of the operation, so painkillers will be supplied as required. Patients should let their pain nurse know if the painkillers are not working as a larger dose or stronger type of painkiller may be needed.

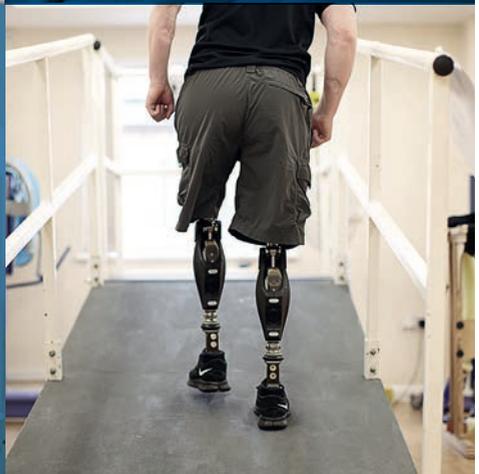
## Preparing for discharge

As a patient gradually recovers from the effects of surgery, they will meet a number of different professionals, such as a social worker, occupational therapist and physiotherapist, to help plan for their discharge. The physiotherapist will also teach a number of exercises to help prevent blood clots and improve blood supply.

## Compression Shrinker Sock

Swelling (oedema) of the stump after surgery is normal. This swelling can continue once the patient is discharged. Using a compression shrinker sock will help with swelling and the stump's shape. It may also reduce phantom pain and give a feeling of support to the limb.

The physiotherapist will measure the patient for a sock once the wound has healed and the sock can be placed over the stitches. The sock should be worn every day but taken off before bed. It is important to wash the sock regularly (every two or three days) and the patient should be supplied with at least two.





## Going Home

How long it takes before the patient is ready to go home will depend on the type of amputation and the patient's general state of health. In many parts of the country, it is common to be transferred to another hospital or ward for a period of rehabilitation following a leg amputation. This is usually done when the facilities of the surgical ward are no longer required.

Before leaving for home, it is likely that an occupational therapist will arrange a visit to see if aids such as a wheelchair ramp or a stairlift are needed to make the home environment more accessible. If these kinds of modifications are deemed to be required, the issue can be referred to the local Social Services department.

It can take several months before a prosthetic limb is fitted, or a prosthetic limb may not be suitable, so those who have had a lower limb amputation may be given a wheelchair.

Meetings with a social worker may also be arranged to see if any additional support is needed at home. A dietitian can advise on changes that can be made to diet to cope with the extra energy requirements that may be needed if using a prosthetic limb.

A follow-up appointment will probably be made two weeks after leaving hospital to discuss any potential need for additional help, support or equipment at home.

Patients may also be given details of their nearest amputee support group, made up of both health professionals and people living with an amputation. Most amputee support groups meet once a month.

**It is likely that an occupational therapist will arrange a visit to see if aids such as a wheelchair ramp or a stairlift are needed**

This is the second in a series of six leaflets about the British Limbless Ex-Service Men's Association, or Blesma, The Limbless Veterans as it is normally known. The other leaflets in the series are:

- 1 Introduction and General Information
- 2 **Amputation Explained**
- 3 NHS Limb Service and Prosthetic Information
- 4 Phantom Limb Pain
- 5 Stump Care
- 6 Wellbeing

All these leaflets can be downloaded from [www.blesma.org/leaflets](http://www.blesma.org/leaflets)  
If you prefer, you can receive hard copies by calling **020 8590 1124**  
or by emailing [chadwellheath@blesma.org](mailto:chadwellheath@blesma.org)

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