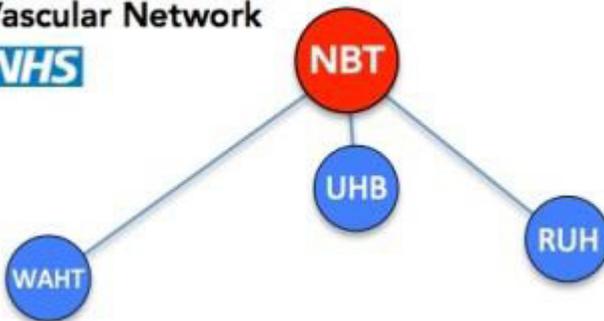


# Surgery for lower limb ischaemia

Bristol Bath Weston  
Vascular Network



*Exceptional healthcare, personally delivered*

## Ask 3 Questions

### Preparation for your Appointments

We want you to be active in your healthcare. By telling us what is important to you and asking questions you can help with this. The three questions below may be useful:



This leaflet provides an overview of surgical treatments for patients who have symptoms due to a reduced blood supply to the feet or legs – this is called “lower limb ischaemia”.

You have been provided with this leaflet either to give you more detailed information about these procedures so you can understand the risks and benefits, or because you and your vascular specialist have discussed the various options for treating your symptoms and have agreed to proceed with this treatment.

If you are listed for surgery, your specialist will provide specific information about the operation planned.

## **The role of the specialist and the MDT**

Every patient who is being considered for an invasive treatment for arterial disease is discussed at a multi-disciplinary team (MDT) meeting. This is a meeting which involves all the specialists who may be involved in your care; that is vascular surgeons, interventional radiologists, vascular scientists, vascular specialist nurses and vascular anaesthetists.

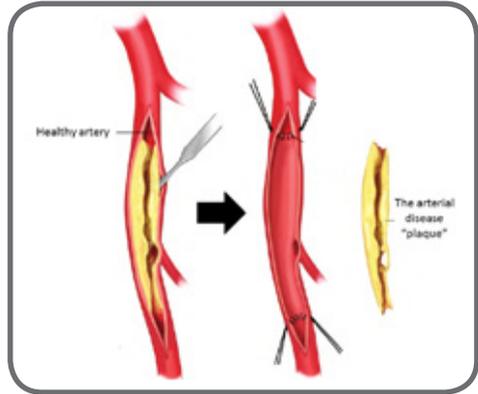
At this meeting, we discuss the investigations you have had; we review your symptoms, your scans to date (site and severity of your arterial disease), and consider your other medical problems if you have any. The specialist team may arrive at a clear recommendation for a specific type of treatment. Occasionally there is not clear agreement about the best way of treating your symptoms. Sometimes the MDT may be of the opinion that the risks of invasive treatment are too high or the likelihood of long term success is too low to offer an invasive procedure. Your vascular specialist should inform you about the result of the MDT discussion.

## Surgical treatment of lower limb ischaemia

There are broadly two types of surgery that can improve the blood supply to the leg; endarterectomy and bypass surgery.

### Endarterectomy

Arteries are made up of a number of layers. Atherosclerosis or “arterial disease” affects only some of the layers of the artery. This means in some areas of the body we can remove the part of the wall of the artery that has the disease within it (the “plaque”) and repair the artery afterwards. This is called an “endarterectomy”.



### When would we consider an endarterectomy?

Sometimes the main artery in the groin area (common femoral artery) becomes severely narrowed or blocked. This artery does not respond well to being angioplastied or by being stented. This artery is also the site at which we normally insert the needle and catheter to do an angiogram/angioplasty. Therefore the only way of improving blood flow down the leg when this artery is narrowed is to perform a surgical femoral endarterectomy.

Sometimes we combine a femoral endarterectomy with another such as an angioplasty or stent of the arteries above (iliac) or arteries below (superficial femoral). This is called “hybrid” surgery.

## What does a femoral endarterectomy actually involve?

In theatre, the vascular specialist will make a 4-6" cut in your groin.

The surgeon must firstly dissect out the artery in the groin and its branches, freeing it from the nearby vein and nerve. Arterial clamps are then placed above and below the area to stop blood flowing. A small cut is made in the artery and the plaque is then dissected off the healthy arterial wall.

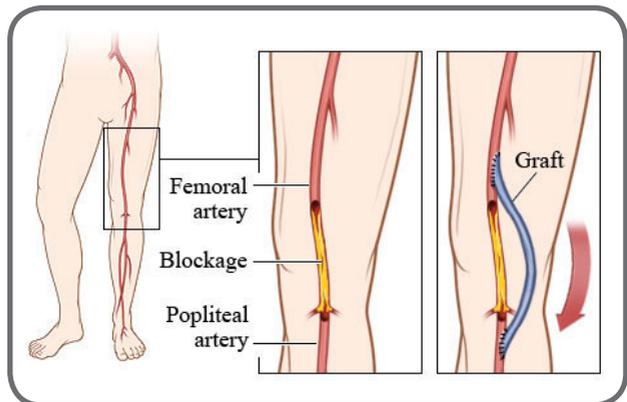
To reduce the risk of the artery narrowing up again in the long term or clotting off immediately it is usual for the surgeon to repair the artery with a "patch" of material and tiny stitches. We may use your own vein, man-made material (dacron) or biological patches (collagen) to repair the artery.

The clamps are released and blood allowed to flow back down the leg. The area is checked for bleeding and the incision then closed up. Most patients will have dissolving sutures. We will keep a very close eye on your foot for the first few hours after the operation by listening to the arteries with a hand held Doppler machine.

## Bypass surgery

Bypass surgery is more complicated and higher risk than endarterectomy.

The surgery involves attaching a tube (known as a "bypass graft") to the artery above the blockage to an artery below the blockage to re-direct blood



directly down below the blocked artery. Usually we can use your own leg vein for the bypass graft. Occasionally we may have to use several veins from the body (legs or arms) to create a long enough bypass graft. Sometimes when bypassing large arteries (such as the around the iliac arteries in the tummy or between the femoral arteries in the groins) or when your vein is not suitable we will use a man-made bypass graft (Dacron or PTFE).

## When would we consider bypass surgery?

Bypass surgery is usually reserved for longer blockages of the artery, and/or when the symptoms are significantly worse. It is commonly done in patients who have symptoms of pain at rest with difficult sleeping, ulceration of the skin in the foot, or even gangrene in the foot or toes. Rarely bypass surgery is done for patient with very short distance claudication (e.g. when they have difficulty leaving the house).

Bypass surgery may be considered after an angioplasty or stent has failed or when your pattern site or severity of disease is most suitable for surgery rather than angioplasty/stenting as recommended by the MDT.

## What does bypass surgery actually involve?

Bypass operations are named after the arteries that are involved.

For instance if you have a blocked artery in the thigh, you may undergo a bypass from the groin (femoral artery) to below the knee (popliteal artery); this would be called a **femoro-popliteal bypass** or “fem-pop” bypass for short. This is the most common type of bypass. We may bypass from the groin to above the knee or to below the knee.

Other bypasses that are commonly done are:

- **Femoro-femoral cross-over bypass** (“Fem-fem crossover”)

This is a bypass from one groin to the other, done when the iliac artery above the groin on one side is blocked.

- **Aorto-femoral bypass** (“Aorto-bifem”)

This is a bypass from the aorta down to the groin. It is usually reserved for patients where the aorta and/or both iliac arteries are blocked up in the tummy.

- **Axillo-bifemoral bypass** (“Ax-bifem”)

This is a bypass from just under the collar bone down the side of the tummy to one groin, then across the tummy below the belly button to the other groin.

- **Femoro-tibial bypass** (“Fem-distal” bypass)

This is a bypass from the groin to a tiny artery lower down the leg than the knee. It is very unusual to do this bypass for anything other than gangrene or pain in the foot at rest.

Before any operation we will decide what kind of bypass material we will use. In the leg we most commonly use a large superficial vein from the same leg (great saphenous vein). This can be removed from the leg and used as a bypass with very little impact on the leg. We will usually do a scan on the day of surgery to mark the vein on your body.

## **Fem-pop bypass**

In theatre, the vascular specialist will make a 4-6” cut in your groin and a similar sized incision either below the knee or above the knee. This depends on the length of the blockage you have and which artery we are going to bypass onto – this is called the “target artery”.

The surgeon will then carefully dissect out the arteries and their branches. All arteries are close to veins and nerves.

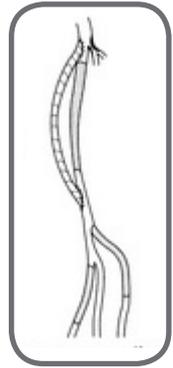
If you have a suitable vein in the leg, the surgeon will make 1-2 additional cuts up the inside of the thigh to allow the vein to be safely removed after all the tributaries have been tied off. We check the vein for any holes and then “reverse” the vein. Veins have valves allowing blood to flow in one direction only from the feet to the heart - the opposite direction to arteries. By

turning the vein the other way around the valves allow blood to flow in the bypass down towards the foot.

Arterial clamps are then placed around the artery in the groin to stop blood flowing. A small cut is made in the artery and the bypass joined to the artery with tiny permanent stitches. The bypass graft is then placed either deep within the thigh or just beneath the skin incisions and run down to the “target” artery below the blockage. Again the artery is clamped, opened and the bypass graft stitched onto the artery below the blockage.

The clamps are released and blood allowed to flow back down the leg. The areas are checked for bleeding and the incisions then closed up. Most patients will have dissolving sutures. Occasionally you may have a drain tube from one or more of the wounds.

We will keep a very close eye on your foot for the first few hours after the operation by listening to the arteries with a hand held Doppler machine.



## Other bypass operations

Your specialist will provide specific information about the operation planned; however the general principles are as described above.

## Results of bypass surgery

It is well recognised that bypasses can become narrowed over time and that they can block. The success of the bypass depends on several factors. In general, the more complicated the operation, and the smaller the arteries involved the lower the rate of success of the bypass. We recognise at least 1 in 4 fem-pop bypasses will block within 5 years.

**In patients with severe limb ischaemia (ulceration or gangrene) 70% of patients are alive without needing an amputation 1 year after the operation.**

## What happens after lower limb surgery?

The main vascular ward in Southmead Hospital is Gate 33B. The vast majority of patients are cared for on this ward before they are discharged from hospital

After uncomplicated femoral endarterectomy, most patients return to the hospital ward for one to three days. After a leg bypass operation patients may stay a little longer. If you require a bypass from the aorta it is normal to be in hospital for 5 to 10 days.

You should be able to eat and drink normally once fully awake following your surgery. The ward team will aim to get you sitting up and walking as soon as possible. If you have a urinary catheter (tube into the bladder put in during surgery) we aim to remove this on the first night or morning after surgery. If you have had aortic surgery the catheter may stay in for longer.

Once you are up and about, you should be able to leave hospital, but may need painkilling tablets for up to a month. It can be normal to make a full recovery in about 2 weeks from a femoral endarterectomy. As a bypass operation involves more cuts in the leg it may take longer to get back to normal activity (6 weeks). Some people may take longer to return to the health state they had prior to the operation. With any procedure some people can tire easily for several months. During this time, you should gradually build up your level of activity back to normal.

You will typically have a dressing over the wound/s or they will have a layer of "glue" over the incision/s. If you have a normal dressing the wound/s should be kept covered for 7 days – we usually put a fresh dressing on the wound on the day you are discharged. After this time you can shower and bathe normally.

## Follow-up

We like to see all patients 6-8 weeks following surgery. We will always try to organise your follow-up at the hospital that is closest to you. If you have had a bypass we will arrange a duplex ultrasound at about 6 weeks.

If you have concerns following your surgery, we are happy to hear from you. The best contact is via the vascular nurse specialist 0117 4145302.

## What is “normal” after the procedure?

There are a number of things which **normally** occur after surgery which are important to highlight.

### Wound

- It is *normal* for the wound in the groin to feel raised and a little lumpy for several months following the operation
- It is *normal* for wounds in the inner thigh/calf to have numb patches around them. This can be permanent.

### Leg swelling

- It is *normal* for the lower leg to swell up after the operation. This is because we have increased the amount of blood going down the leg, and interfered with the fluid drainage out of the leg (lymphatics) by making a cut in the groin. This leg swelling usually settles after a few weeks or months. Rarely, it is permanent. Keeping your legs up after the operation can help.
- Leg swelling is worse after a bypass than a common femoral endarterectomy.

## What problems can occur after the procedure?

**You should be aware that surgery can replace one unpleasant symptom (leg pain when you walk or pain at night in the foot) with another set of unpleasant symptoms – although most settle within a few weeks of the operation.**

Any operation involving a general or spinal anaesthetic carries with it some risks. Patients who have diseases in arteries of the leg are known to be at higher risk of heart attacks and lung complications (chest infections) after any operation. As such any operation on your arteries carries with it a risk of death.

### **Bleeding and bruising**

- It is *common* to have some bruising around the wounds.
- *Occasionally* patients may develop a collection of blood (haematoma) which is felt as an uncomfortable lump. This can be underneath any of the wounds. Normally this requires no surgical treatment, but may require you to have a scan and take pain killers for a longer time.
- *Rarely* you may need to return to theatre on the day of surgery or the day following surgery because of bleeding from the artery or bypass. If this happens stopping the bleeding is always the priority.

## Wounds

- It is **quite common** for the wound to become a little red or the skin edges of the scar to come apart by a few millimetres. This can normally be easily managed with a dressing and the input of your practice nurse.
- **Occasionally** clear fluid can collect beneath the wound (a “seroma”) causing a soft lump. This fluid can also leak out. These problems are more common in patients who have had operations in the groin previously. In the vast majority of cases the lump disappears over a period of months – you may need to be seen by a specialist to ensure there are no signs of deep infection. If you develop a leakage of fluid this is a very troublesome complication which can be difficult to deal with. Generally the leakage eventually stops by itself, but it does take weeks.
- **Rarely** the area where we have closed the wound or wounds can breakdown. Although this can usually be managed by the community team with regularly dressings it can be a very distressing complication which can take weeks or even months for the wounds to heal up. It is unusual to need further surgery. There is normally no place for closing up the wound with stitches as this can trap infection deep inside the wound.

## Pain

- **Occasionally** patients may experience burning pain or odd sensations like water running down the leg on the inner or out thigh/calf or over the knee cap. This occurs when the nerve which supply these areas have been bruised during the operation. These sensations usually disappear completely between 6 weeks and 3 months. Rarely patients have permanent symptoms.

## Infections can occur in any wound.

- If the infection is superficial this can be managed by your GP with a short course of tablet antibiotics
- *Rarely* the infection may be deeper. In this case the wound becomes more painful and mucky fluid may drain out of the wound. You may feel feverish or unwell. Deep wound infection is a rare, but serious complication. **You will need to return to hospital if this is suspected.**
- **If you get a deep infection in the groin after common femoral endarterectomy or bypass surgery there is a risk that the artery and the repair of the artery may be affected. If this happens the artery repair can fall apart, resulting in life threatening bleeding from the groin. This requires emergency lifesaving surgery. The arteries in the groin will need to be tied off and the groin wound “left open”. If this happens, you could lose your leg (above knee amputation)**

### Leg blood flow

- It is possible that the operation does not improve all of your symptoms, or does not improve your quality of life as much as you hoped.
- Bypass operations may occasionally block off very early after the operation. In some patients an attempt may be made to restore blood flow in the bypass, but this is not appropriate for everyone. The more complicated you bypass the higher risk of failure (e.g. second bypasses, bypass using vein from the arms rather than the leg)
- You may develop new narrowings in the groin artery or in the bypass graft over time which may bring back your symptoms or may put the bypass a risk of clotting off. These may be treated with angioplasty or may rarely need further surgery.

- **Any procedure we perform on your arteries has the potential to MAKE YOUR LEG BLOOD SUPPLY WORSE RATHER THAN BETTER.**
- **There is a small risk of major amputation (losing your leg below or above the knee) after surgery**

The Vascular Society of Great Britain & Ireland asks surgeons to collect data on all patients having major arterial operations in the National Vascular Registry. This has given useful information about how common some complications are in the UK. It should be remembered that the vast majority of operations are done for patients with critical limb ischaemia rather than intermittent claudication. Patients with a severe lack of blood supply to the leg are less fit than patients with intermittent claudication and as such are more at risk of life and limb threatening complications after surgery. **The data available is for all patients having surgery not just those who have intermittent claudication. It also includes patients admitted as emergencies who are at much high risk of complications.**

Despite the **limitations** we think it is useful for you to see these risks from 2016.

**For all patients in the UK who have had bypass surgery or femoral endarterectomy as a planned or emergency operation:**

- Risk of having to come back into hospital with 30 days
  - 1 in 10 patients
- Risk of a further procedure on the leg within 30 days
  - 1 in 11 patients
- Risk of amputation
  - 1 in 26 patients
- Risk of death
  - 1 in 33 patients

**NOTE: Only 30% of these patients had intermittent claudication. The vast majority had gangrene or pain in the foot at night (rest pain)**

# Ask 3 QUESTIONS: summary

## What are the options?

Your options will depend on your symptoms and the severity and site of your arterial disease.

### ■ Lifestyle changes and medication

Patients with claudication should always try to make these changes before considering intervention.

Patients with severe limb ischaemia (pain at rest or non-healing foot ulcers) may need intervention as well as medication in order to prevent them from losing their legs

### ■ Angioplasty/Stenting

Lower limb surgery may be considered either because angioplasty/stenting has failed; or the site/severity of disease is not suitable for angioplasty alone (e.g narrowed groin artery) or because the MDT recommends bypass as the option that will give a better long term result in that situation.

### ■ Surgery

Lower limb surgery is usually offered when the leg has a very reduced blood supply and symptoms are severe. In patients who are fit enough we will offer procedures which aim to get more blood flowing down the leg (endarterectomy or bypass). Sometimes it may not be possible to perform such an operation (e.g. frailty/ill health; severity of arterial disease; amount of tissue destruction in the leg). We then need to discuss the options of amputation or palliation (strong pain killers/dressings)

### ■ Symptom control

Some patients may choose to try to control pain with strong pain killers rather than undergo risky surgery. We know that patients with an ulcer or gangrene in the leg have a reduced life expectancy.

What are my **options**?

What are the possible **benefits** and **risks** of those options?

What help do I need to make **my decision**?



## What are the pros and cons of the options?

Option	Angioplasty or Stents	Bypass Surgery	Symptom control
Pros	<p>Low risk of major complications</p> <p>Done with you awake</p> <p>No need for surgical incisions</p> <p>Most cases no need to stay in overnight</p> <p>“Quick fix” – often immediately better</p>	<p>Best way of measurably improving blood supply to foot and calf in the long term (but at risk – see below).</p>	<p>No procedure risks</p>
Cons	<p>Complications: Groin pain, leg swelling, infection or bleeding</p> <p>Re-stenosis - procedure can fail in the short term, and may need to be repeated</p> <p>Need for medication (antiplatelet agents)</p> <p>Increased risk of losing your leg compared to life style changes</p>	<p>MAJOR surgery</p> <p>Requires general anaesthetic</p> <p>Requires one or more incisions</p> <p>Requires at least one night in hospital</p> <p>New symptoms due to the operation (wound problems/ leg swelling)</p> <p>Complications: Risk of losing your leg, nerve injury, heart attack or death. 1 in 5 patients have wound problems.</p> <p>Restenosis: Bypass can fail (1 in 4 at 5 years)</p>	<p>Pain killers not very effective at relieving symptoms caused by lack of blood supply</p> <p>Strong painkillers have side-effects (constipation, drowsiness, nausea and sickness)</p> <p>Leg likely to continue to get worse</p>

## What help do I need to make my decision?

The team involved in your healthcare want to help you become as involved as possible in making decisions by giving you information about your options. In giving you answers to these questions and therefore understanding what's important to you, the specialist team will then be in the best position to help you make any choices about treatment.

You have been provided with this leaflet to give you information about **one** of treatment options. We are very happy to answer any queries you have having read these information leaflets.

There are always pros and cons for each choice, it is a good idea to think about what is important to you. Your specialist and the wider team may have a strong recommendation for you; however we always want to come to a shared decision for your treatment.

If you have questions, we are happy to hear from you. The best contact is via the vascular nurse specialists on 0117 414 5302, or via your Consultant's Secretary whose name and number should be on your clinic letter.

**PATIENT  
APPROVED** 



[www.nbt.nhs.uk/vascularsurgery](http://www.nbt.nhs.uk/vascularsurgery)

If you or the individual you are caring for need support reading this leaflet please ask a member of staff for advice.

© North Bristol NHS Trust. This edition published January 2018. Review due January 2020. NBT003078

take part...  
be **involved**...  
in research



While in our care, you may be invited to take part in a research study.

To find out more visit:  
[www.nbt.nhs.uk/research](http://www.nbt.nhs.uk/research)



[southmeadhospitalcharity.org.uk](http://southmeadhospitalcharity.org.uk)

Southmead Hospital Charity raises funds for departments and wards throughout the Trust, meaning you can support an area close to your heart