Leg Bypass Surgery

What is this operation?

A leg bypass reroutes blood around diseased arteries in the leg by attaching a graft to the artery above and below the diseased segments. A femoro-popliteal bypass is the most common type of bypass and uses a vein -typically the long saphenous vein- to divert blood from the artery in your groin (femoral artery) to the artery above or below your knee joint (popliteal artery). Other types of leg bypasses include femoro-distal bypass where the blood is diverted from your groin to an artery in your calf (distal) or foot (ultra-distal). In our experience the majority of leg bypass procedures are combined with a femoral endarterectomy to ensure an adequate flow rate is achieved in the bypass.

Why is this operation being offered?

For the majority of clients leg bypass surgery is undertaken to treat severe, symptomatic peripheral arterial disease; in other words leg pain that significantly impacts on the quality of life or one's ability to work, non-healing ulcers, or a leg that is threatened as a result of lack of blood supply (critical limb ischaemia). Where these symptoms and their sequelae are caused by long blockages or multi-level blockages of the arteries in the leg a bypass operation may offer a more durable solution than an angioplasty/stent insertion.

Femoro-popliteal and femoro-distal bypass surgery may also be undertaken to treat popliteal artery aneurysms or to reconstruct the leg circulation in cases of severe popliteal entrapment or cystic adventitia disease.

What happens before your operation?

Before you undergo leg bypass surgery a number of essential investigations and assessments are performed to assess the suitability of your disease for bypass surgery as well as your overall fitness to undergo major arterial surgery. These may include:

- Angiogram
- Blood tests
- CT angiography
- Duplex Doppler ultrasound assessment of the proposed vein graft.
- Duplex Doppler ultrasound examination of the leg arteries
- ECG

Once the decision has been made to proceed to bypass surgery an admission date will be agreed between yourself and your surgeon. A pre-admission visit may be required to complete paperwork and undertake blood tests or other allied tests required prior to undergoing a general anaesthetic. Please bring all your medications to your pre-admission review.

What happens on the day of admission?

You will usually be admitted the day before surgery so as to ensure all requirements prior to surgery have been adequately completed. Your surgeon will visit you and ask you to sign a consent form for your operation. You will also be visited by your anaesthetist. The planned vein graft will be pre-operatively marked with indelible pen under ultrasound guidance: please do not wash this off prior to the operation

Please do not stop any of your normal medications unless specifically instructed to by your surgeon

If you smoke we strongly encourage you to stop as soon as possible to reduce the risk of peri-operative complications.

What do I need to bring when I come into hospital?

You should bring the following items with you at the time of admission:

- All you normal medication
- Nightwear & slippers
- Toiletries
- A set of comfortable clothes for discharge
- A good book

What happens during the operation?

The first part of your operation involves giving you an anaesthetic. The majority of leg bypasses are performed under general anaesthesia (with you asleep). Occasionally a leg bypass may be performed under a spinal anaesthetic where an injection into your back numbs you from the waist down for the duration of the procedure. In our experience clients prefer and find it more comfortable to undergo a leg bypass under general anaesthesia.

Once you have been anaesthetised you will have a tube (catheter) inserted into your bladder to drain your urine. This facilitates accurate assessment of your hydration status during and immediately after the operation. Occasionally the anaesthetist will decide to insert a small tube into an artery in your wrist to enable accurate measurement of your blood pressure during your operation. Once the necessary monitoring equipment has been connected your surgeon will start the operation.

The circulation clinic undertakes all leg bypasses as a joint case with two of our consultant surgeons operating together. This reduces the time taken to perform the operation and thereby the time you are under general anaesthesia. We strongly believe this improves our clients outcomes and reduces the risk of a variety of potential complications including heart attacks, kidney failure, respiratory complications and infection rates.

For a femoro-below knee popliteal bypass one surgeon will expose the femoral artery through a 5-10cm vertical incision in the groin. Concomitantly, the second surgeon will expose the below knee popliteal artery through a similar length incision on the inner aspect of the calf. The pre-marked vein is then harvested through a number of small incisions on the inner aspect of your thigh and calf. The vein is then removed from your leg and assessed for integrity.

The femoral artery is then opened (arteriotomy) and cleared of any disease (endarterectomy). In a number of cases the blood flow into the femoral artery is affected by disease in the pelvic arteries. If this is deemed to be insufficient to sustain a bypass your surgeons may elect to perform an angioplasty +/- stenting of the pelvic (iliac) arteries to improve the blood flow into the femoral artery. Once adequate flow has been established into the femoral artery one end of the vein graft is joined (anastomosed) to the femoral artery using permanent stitches. The vein graft is then tunnelled through the leg and joined to the below knee popliteal artery creating the leg bypass.

The wounds are repaired in layer with stitches. A drain is often inserted into the wounds to drain any excess fluid that may accumulate in the immediate post-operative period. The leg is then dressed with absorbent adhesive dressings.

What are the risks?

All surgery is associated with risk. Leg bypass surgery is a major surgical procedure and thus the risk of suffering a complication is higher than following minor surgery e.g. hernia repair.

Complications of surgery can broadly be categorised according to when they occur (during the hospital admission (early) or following discharge (late)) and whether or not they occur at the site of surgery (local) or affect the entire body (systemic).

Some possible complications of leg bypass surgery include:

- Early complications:
  - Local
    - Wound related
      - Bleeding
      - Infection
      - Wound breakdown
      - Fluid collection
    - Injury to surrounding structures
      - Nerve damage causing numbness, pain or weakness in the leg
      - Lymphatic leak causing leakage from the wound, collection or leg swelling
    - Graft complications:
      - Bleeding or blockage requiring re-operation.
      - Graft infection (rare)
    - Blood clot in leg (deep vein thrombosis)
    - Limb loss
  - Systemic
    - Heart related
      - Heart attack
      - Irregular heart rhythm
    - Lung related
      - Pneumonia
      - Fluid on the lungs
      - Clot on the lung (pulmonary embolus)
    - Kidney related
      - Kidney failure that may require temporary dialysis
- Late complications
  - Graft narrowing (stenosis) requiring re-intervention:
    - Approxiamtely 1/3rd of graft will require some form of re-intervention within the first year to maintain graft flow. The majority can be undertaken as a daycase angioplasty, but some do require a further operation. Once the graft has survived for one year less than 5% of grafts require re-intervention each year thereafter.
  - Graft blockage
    - >75% of grafts are likely to be flowing at 3 years post-surgery

- Leg swelling
  - The majority of clients will have some degree of leg swelling following leg bypass surgery. This rarely causes significant morbidity.

- Chronic pain
  - Some clients may suffer with pain at the site of their healed incisions which requires ongoing pain relief treatment.

All these potential complications are understandably concerning to our clients. Rest assured our surgeons make every effort to ensure your risk is reduced to the lowest level possible through our expertise and experience. The overall risk of you suffering from a major complication that either threatens your life or leg is about 5% i.e. for every 100 clients we perform a leg bypass surgery on 95 will make a full recovery from the operation and be discharged home. When complications do occur we pride ourselves in dealing with them rapidly and appropriately.

What happens after the operation?

The majority of clients remain in hospital for one week for monitoring and recuperation. During this period of convalescence you will initially be confined to bed and a chair for 24 hours post-surgery. Then we begin to mobilise you so that by the time of discharge you are able to walk independently and perform your daily ablutions unaided. Sometimes, clients require further rehabilitation and will remain in hospital for longer than one week to regain strength. Throughout this period of recuperation there will be discomfort at the site of the operation which we treat with pain medication.

What happens when I go home?

Although at the time of discharge we ensure you are safe to go home we ask that there is an responsible adult with you for the first few days following discharge.
You will be able to have a shower at 48 hours post-surgery but we ask you to refrain from bathing until the wounds are fully dry.

For the first few weeks post-surgery there is often muscle discomfort, leg swelling and wound leakage. You may feel physically exhausted doing relatively minor activity, rest assured this entirely normal and improves with time.

The majority of clients are able to return to work within 6 weeks of discharge, but this does depend on the nature of your employment, the type of leg bypass you have had and how well

you recuperate from your surgery. If in any doubt please wait until you have been reviewed in clinic by your surgeon.

When Will I be able to drive?

You are able to drive when you are able to perform an emergency stop and are able to concentrate fully on driving. Overall we advise you to not drive a car for the first 4 weeks post-surgery or until you have pain free movement of your foot and knee, and are able to stamp your foot on the ground. Different rules apply for different 'Group' license holders and we recommend contacting the DVLA and your car insurance company for further advice.

Will I need to see the surgeon again?

We review all leg bypasses in clinic approximately 6 weeks following discharge.

All clients who have undergone bypass surgery are entered into a graft surveillance programme to help prevent graft failure through early identification of graft or native artery narrowing.