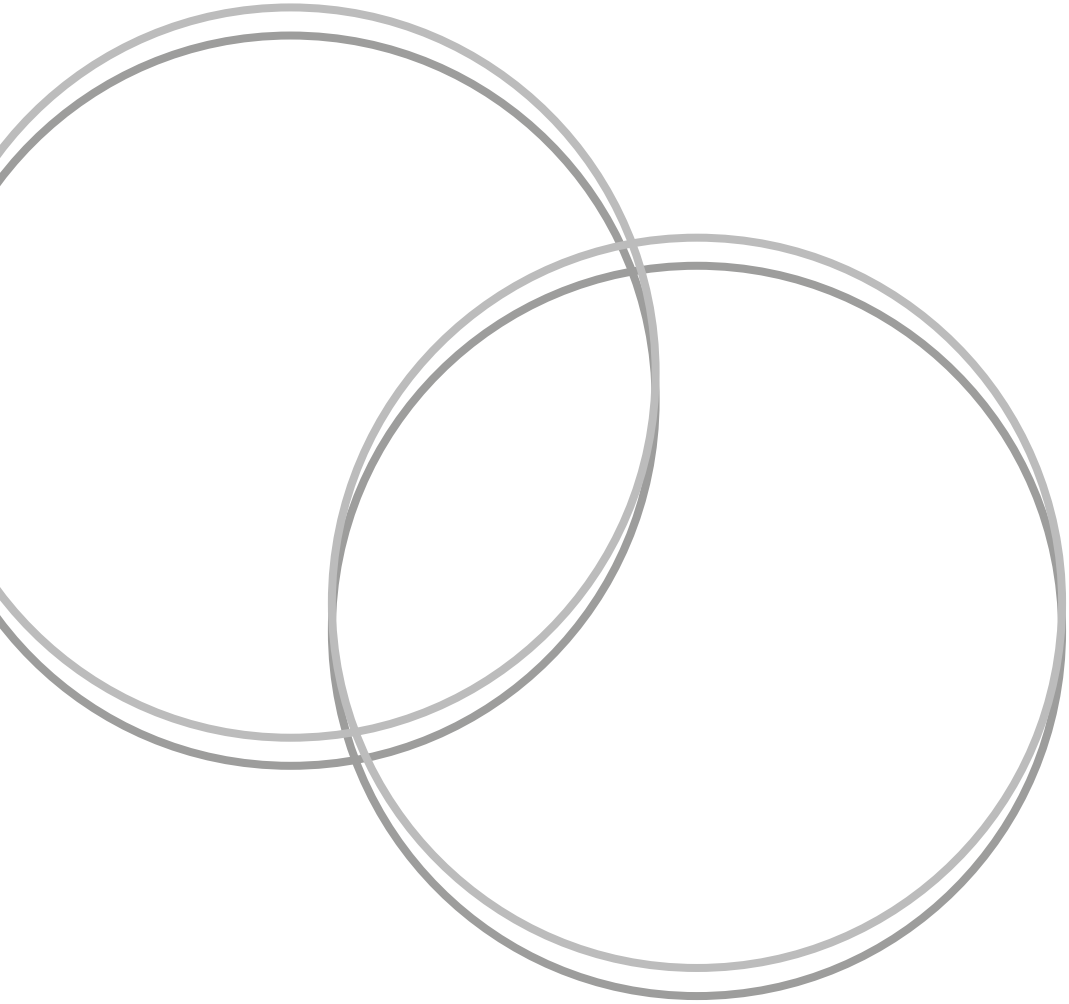
NHS
Oxford University Hospitals
NHS Foundation Trust

Advice for lower limb bypass surgery

Information for patients



This booklet will give you information about the procedure including why your surgeon has recommended it, what will happen during and after. The leaflet also includes advice and information on how to manage when you are discharged from hospital.

We hope it will answer many of your questions. Please speak with a member of the team if you need any more information. We are here to help you.

Why am I having this surgery?

Critical limb threatening ischemia (CLTI) is a severe condition of peripheral arterial disease (PAD), which results from a progressive thickening of an artery's lining caused by a build-up of plaque. This build-up of plaque, also known as atherosclerosis, narrows or blocks blood flow, reducing circulation of blood to the legs, feet, or hands.

The most common symptom is intermittent claudication, a cramping pain caused by a poor supply of blood to the affected muscle. It often affects the calf muscle and is typically triggered by exercise and relieved by rest. However, if the blood supply continues to get worse, you may experience pain at rest with difficulty sleeping and may develop ulcers or even gangrene of the toes or feet and limb amputation. Without proper and immediate treatment, patients with CLTI may be at risk of amputation and related complications.

When would we consider bypass surgery?

Bypass surgery is typically reserved for cases where the artery has a long blockage, and symptoms are severe. This procedure is commonly performed on patients who experience pain, with difficulty sleeping, ulceration of the skin in the foot, or even gangrene in the foot or toes.

Bypass surgery is occasionally considered for patients who experiencing claudication after walking a very short distance. It may also be considered if an angioplasty or stent procedure has failed, or if the location , pattern, or severity of your condition makes surgery more appropriate than angioplasty or stenting.

What are the benefits of bypass surgery?

The surgery should improve the blood supply to your leg and improve the pain you have experienced. In addition, the improved blood supply should improve the healing of any leg ulcers or gangrene or prevent these from occurring.

What does bypass surgery involve?

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, known as the great saphenous vein. This can be removed and used as a bypass with minimal impact on your leg. On the day of the surgery, we will usually perform a scan to locate and mark the vein on your body.

During the procedure, the surgeon will carefully dissect the arteries and their branches during the operation. Since arteries are located close to veins and nerves, this process requires precision. If a suitable vein is found in your leg, the surgeon will make one or two additional incisions along the inside of your thigh. This allows the vein to be safely removed after all its tributaries have been tied off.

Next, a small incision is made in the artery, and the bypass graft is connected to the artery using tiny, permanent stitches. The bypass graft is then positioned either deep within the thigh or just beneath the skin incisions, and it is routed down to the artery below the blockage.

Types of bypass procedures

Bypass procedures are named according to the arteries involved in the surgery. For instance, a bypass from the groin (femoral artery) to below the knee (popliteal artery) is called a femoropopliteal bypass or "fem-pop" bypass. These procedures generally require either general or regional anaesthetic.

Here are some other common bypass procedures:

Femoro-femoral cross-overbypass ("Fem-fem crossover")

This procedure involves creating a bypass from one groin to the other, typically when the iliac artery above one groin is blocked.

Aorto-femoral bypass ("Aorto-bifem")

In this procedure, the bypass runs from the aorta down to the groin, used for blockages in the aorta and/or both iliac arteries in the abdomen.

Axillo-bifemoral bypass ("Ax-bifem")

This bypass starts under the collarbone, runs down the side of the abdomen to one groin, and then crosses the abdomen below the belly button to the other groin.

Femoro-tibial bypass ("Fem-distal" bypass)

This involves bypassing from the groin to a small artery lower down the leg, below the knee. It is rarely performed except in severe cases, such as gangrene or severe rest pain in the foot.

Fem-pop bypass

In theatre, the surgeon will make a cut your groin and a similar sized incision either below the knee or above the knee.

What are the risks?

As with any major operation there is a risk of complications. The following are risks that can be associated with this procedure.

Bypass blockage:

One of the primary complications is blood clotting within the bypass graft, which can cause it to become blocked. If this happens, another operation may be necessary to clear the blockage.

Chest infections:

These can occur following this type of surgery, particularly in smokers, and may require treatment with antibiotics and physiotherapy.

Wound infection:

Wounds sometimes become infected, and this may need treatment with antibiotics. Severe infections are rare. Occasionally, the incision may need to be cleaned out under anaesthetic.

Graft infection:

Although very rare (around 1 in 500 cases), artificial graft may become infected. This serious complication usually requires the removal of the graft.

Fluid leak from wound:

Occasionally the wound may leak fluid. This may be clear but is usually blood stained. It normally settles in time and does not usually indicate a problem with the bypass.

Bowel problems:

The bowel may be slow to resume normal function after the operation. In such cases, fluids will be administered through a drip until bowel function normalises.

Limb swelling:

Normal post-operative swelling, usually resolving within a few months.

Skin sensation:

You may have patches of numbness around the wound or lower down the leg which is due to the inevitable cutting of small nerves to the skin. This can be permanent in some cases, but usually improves within a few months.

Bleeding:

If you have any bleeding from a wound, apply firm pressure to that area. Seek medical advice immediately from your GP or call the ward (see end of the leaflet for contacts).

Major medical complications:

As with any major operation there is a small risk of you having a medical complication such as a heart attack, stroke, kidney failure, chest problems, loss of circulation in the legs or bowel, or infection in the artificial artery. Each of these is rare, but overall, it does mean that some patients may have a fatal complication from their operation. For most patients, this risk is about 5% – in other words 95 in every 100 patients will make a full recovery from the operation.

Limb loss:

Very occasionally when the bypass blocks and the circulation cannot be restored, the circulation of the foot is severely affected, so that amputation is required.

Who will be involved in my care?

There are many professionals who work together to provide the care and support that you need, both during your hospital stay and after you are discharged.

Doctors:

You will be under the care of a consultant surgeon whilst you are on the ward, who will have a team of doctors helping them. They will see you regularly while you are in hospital to monitor your recovery and manage any medical issues that you may have. When you are discharged you are likely to see your consultant as an outpatient. They will hand over your day-to-day medical care to your GP.

Nurses:

The nurses will take care of you from the day you are admitted, until the day you leave the hospital. They will be there to help and advise you with personal care, wound care and checking the condition of your skin. They are also your link with other staff involved in your care.

There is a vascular nurse specialist within the team, who is available for more specific support and advice, If you feel this is needed.

Physiotherapist:

The physiotherapy team will help you regain your strength and confidence following surgery. You will be provided with advice and recommended exercises to help you regain movement and strength in your legs. They can also supply relevant walking aids to support your mobility.

You may also meet the occupational therapist, pharmacist, dietitian, and other specialist teams who can give advice on aspects of your care.

What to expect after your surgery

After your operation you will be transferred to the recovery room where you will be monitored until you are awake enough to be moved to the ward. You may feel sleepy and disorientated, this is an effect of the anaesthetic. You will be monitored closely for the first few hours after your surgery. You may have an oxygen mask over your mouth and nose, to help you recover from the anaesthetic. You may also have some lines or tubes attached to you. The common attachments after surgery are:

- A drip in your arm for fluids and medications.
- Pain relief: either as a patient-controlled analgesia (PCA) going into your arm or hand, or a thin epidural line in your back.
- A catheter: a tube going into your bladder to drain urine into a bag. This will normally be removed once you are able to move more freely.
- Wound dressings.

Pain control

It is normal to experience pain or discomfort in the early days after surgery, usually around the site of your wound. Some bruising and swelling of your operated leg(s) is to be expected. This will improve as your healing progresses.

You will be given painkillers to help keep you comfortable. It is important to let someone know if you are in pain. Good pain control will help you to move more freely, helping you to recover quicker.

When will I start getting out of bed?

Your surgeon will discuss with you when you can start to move your leg and sit out of bed. This is usually within the first day or two following your operation. This will be discussed with the ward team, including your physiotherapist. They will offer advice and support to help you achieve this initially. If your pain is well controlled and the team are happy, you may start walking at this stage. To achieve this, you may need a walking aid initially to ensure you are safe.

It is important to maintain elevation of your operated leg, when at rest, to help reduce swelling. The ward team should provide you with a stool or support to enable this.

What exercises will I be given?

The physiotherapist will visit you after your operation and teach you some simple exercises. These will help you to regain your movement and strength in your leg and reduce the risk of stiffness in the joints. They can also give you advice about increasing your activity ready for when you go home.

The following exercises should be practiced four times a day. Try to stretch each movement as far as is comfortable. It is normal to feel some stretching of the wound. It may feel uncomfortable to start with but will get easier with practice. If these exercises cause severe pain, stop, and let one of the team know.

You will make better progress by practicing these exercises after taking your painkillers. Continue with these exercises every day until your movement is fully restored and you are comfortable.

Knee extensor strengthening without weights

- Position yourself lying on your back with a rolled towel under your knee.
- Start with your knee bent slightly over the rolled-up towel.
- Straighten your knee, lifting your foot clear from the bed.
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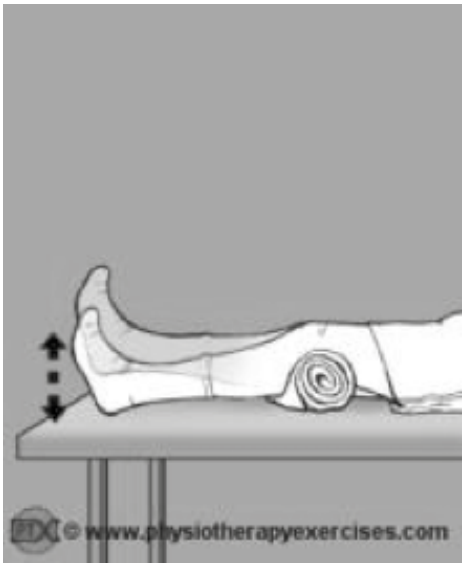
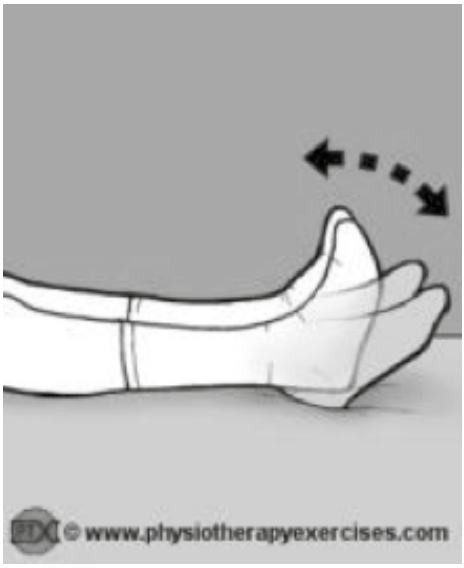
- Hold for 5 seconds and lower your leg back to the starting position.
- Repeat 10 times.



Always remove the towel after completing the exercise.

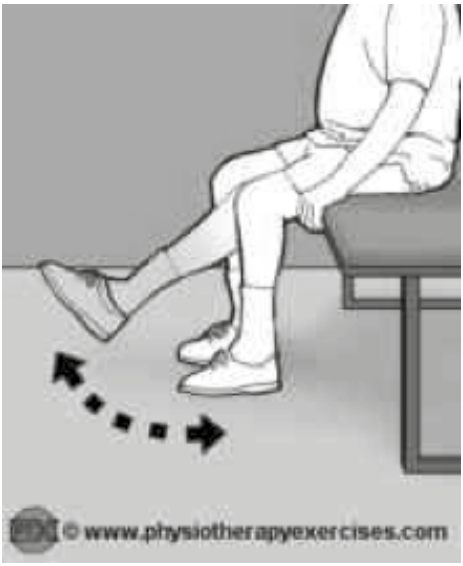
Ankle dorsiflexor/plantarflexor strengthening without weights

- Position yourself lying on your back.
- Pump your feet up and down, stretching your ankles as far as comfortable.
- You will feel a stretch in your calf muscles.
- Repeat 10 times.



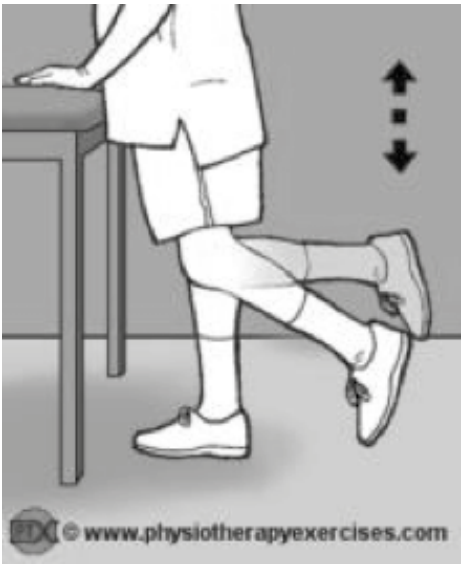
Knee extensor strengthening without weights

- Sit on the side of your bed or on a chair.
- Starting with your knee bent, straighten your knee by lifting your foot from the ground.
- Hold for 5 seconds and lower your foot to the floor.
- Repeat 10 times.



Knee flexor strengthening without weights

- Position yourself standing with your hands resting on a stable surface e.g., windowsill or kitchen counter.
- Starting with your knee straight, bend your knee by lifting your foot up towards your buttocks.
- Lower your foot slowly to the floor.
- Repeat 10 times.



Walking

Walking is the best exercise you can do in the initial stages of your recovery. You will need to build up the distance you walk gradually, aiming for a short distance every couple of hours during the day. Start by standing and marching on the spot, walking around the bed space or to the toilet. This is the best way to gain your balance and confidence in preparation for going home.

Once you are back at home, walk around your home frequently and start practising walking outside each day. Use markers such as streetlights to mark your progress and try to increase the distance you cover a little each day. Think about your normal walking habit and try to build back to that.

Exercise related to intermittent claudication has a unique role as it enhances the development of a collateral circulation. This is where exercise encourages small arteries in the legs to carry more blood, improving overall blood flow.

Stairs

If you were previously able to manage the stairs, you are unlikely to have a problem after your operation. Most people manage with a handrail for support. Take it slowly and use one step at a time. Lead with your 'good' leg going upstairs and lead with your 'operated leg' on the way down.

Your physiotherapist can help you practice stairs before you go home. Please let us know if you are concerned and would like any help.

Preparing to go home

The whole team will work closely with you as you recover from the operation and plan for your discharge from the hospital. We are here to make sure that you have the right information and support as you recover. If you or your family have any concerns about your care or discharge plans, please do speak to one of the team.

How long you need to stay in hospital after your surgery may vary. It will depend on several factors including the following:

Wound healing: your wound needs to be healed enough to be managed safely at home. The hospital nursing staff will give advice on how to care for your wound at home. Your GP practice nurse or district nurse may be able to help you if needed.

Mobility: You need to be able to walk safely and far enough to manage your normal daily activities at home, including climbing stairs if required.

Daily activities: You should be able to manage your own personal care and functional tasks such as getting in and out of bed, getting washed and dressed and cooking meals. If you need support to manage these tasks, please speak with the ward staff to discuss what options may be available.

Medications: You can manage your own medications at home. A list of what you should be taking and when, will be provided on discharge.

After discharge from hospital

If your stitches or clips need removing, we will arrange for your GP practice or district nurse to remove them and check your wound. If there is any swelling or discharge form the wound when you are home, please contact your GP. Once your wound is dry you may bathe or shower as normal.

Returning to work:

Most people are back to work six weeks after the operation. Please ask staff if you require a sick certificate for work and this will be given to you before you leave the hospital. For an extended time off work, your GP can provide an additional certificate.

Returning to normal activity:

You should be able to gradually resume normal activities when you feel well enough. Avoid heavy lifting and frequent stretching at first. Regular exercise such as a short walk, combined with rest is recommended for the first few weeks following surgery, followed by a gradual return to your normal activity.

Driving:

You will be able to drive when you are able to perform an emergency stop. If you are unable to stamp your foot on the ground without discomfort, you are not ready to return to driving. You should have normal, pain-free movement of the leg and be confident that you can concentrate fully while driving. This typically takes 2 to 4 weeks after surgery, but if in doubt check with your own doctor.

Please note that different rules apply to different types of driving licences. For clarification, check with the DVLA (Driver and Vehicle Licensing Agency).

Medicines:

You may be given aspirin and/or clopidogrel to make blood less sticky to reduce the risk of your bypass blocking. This will usually be continued indefinitely. If you have questions about this, please ask the team or your GP.

Staying healthy

Skin:

Poor circulation can make your skin very dry. It is important to keep your skin moisturised to prevent cracking, which increases the risk of infection.

Foot health:

Inspect your feet daily. You can use a long-handled mirror or ask someone to help you. Seek advice from your GP, nurse, or podiatrist if you find any cuts, blisters, or inflamed areas.

Check your footwear regularly for rough edges or sharp areas. Ensure your new footwear fits well, with plenty of room for your toes. Avoid tight socks or stockings. Seek advice from a podiatrist on how best to cut your toenails. Never treat corns or calluses yourself.

Smoking:

If you were previously a smoker, it is crucial to make a sincere and determined effort to quit completely. Continued smoking will cause further damage to your arteries and increase the likelihood that your bypass will fail.

Cigarette smoke contains 4,000 active compounds that have a harmful effect on your blood vessels. The Nicotine causes the blood vessels to narrow, reducing blood flow to your extremities. It also increases your heart rate and blood pressure. Additionally, the carbon monoxide in tobacco smoke reduces the amount of oxygen delivered to your tissues.

We understand that giving up smoking can be difficult, but you do not have to do it alone. When you are ready, your GP or clinical support team can offer help and guidance to assist you in quitting.

Hypertension (high blood pressure):

High blood pressure is a significant risk factor in vascular disease and is associated with development of atherosclerosis and claudication. If you have high blood pressure it is usually managed by your own GP who will recommend that you make lifestyle changes, as these lower your blood pressure and reduce your alcohol and salt intake. Your doctor may have also prescribed medication. Please ensure that your blood pressure is monitored regularly.

Diabetes:

If you have diabetes, it is important that your blood sugar levels are well controlled. Uncontrolled blood sugars can contribute to poor wound healing and other complications.

Diet:

Abnormal fat levels in the blood can result in atherosclerosis. High cholesterol is a significant risk factor for developing vascular disease and intermittent claudication. If you are overweight, losing weight can be beneficial. However, maintaining a healthy weight alone does not guarantee a balanced diet or adequate nutrition.

It is important that you are eating enough energy (calories) and protein to support wound healing. You may need to increase your intake to aid in your recovery. If you have a poor appetite, eating small, frequent meals or fortifying your food with additional calories and protein can be helpful. Oral nutritional supplement drinks may be necessary if you are not receiving sufficient nutrition or are losing weight. Avoid weight loss diets until your wounds have fully healed to ensure you are getting the necessary energy and nutrients.

Protein is crucial for building and repairing muscle, skin, and other tissues. Good sources of protein include meat, poultry, fish, eggs, dairy products, legumes, pulses, nuts, and alternative proteins.

Micronutrients such as iron, zinc and vitamins A, C and E also play a role in wound healing. A well-balanced diet that includes all five main food groups will help ensure you receive all the essential nutrients.

If you feel you are not getting enough nutrients, are underweight or are losing weight, speak to a member of the team or dietitian for more information on nutrition support.

Follow up appointment

We aim to see all our patients 6 to 8 weeks following surgery. We will always try to organise your follow-up at the hospital closest to you. A duplex ultrasound will be arranged at about six weeks to ensure that the graft is working well and there is no narrowing of the bypass which may lead to a blockage.

You may be asked to attend the hospital at intervals following the operation, usually every three months initially. These visits may involve an ultrasound scan of your bypass to ensure that it is functioning properly.

How to contact us

If you have any concerns when you are at home, speak to your GP or call NHS 111 for advice (dial 111 free from any landline or mobile).

If you develop sudden pain or numbness in your leg which does not get better within a few hours, contact your GP or Ward 6A at the John Radcliffe Hospital Immediately.

Ward 6A

Telephone: 01865 221 802 or 01865 221 804
(24 hours)

Physiotherapy

Telephone: 0300 304 7777 and ask for Bleep 1758
(8.00am until 4.00pm, Monday to Friday)

Useful contacts

Here for Health – Health improvement Advice Centre

Oxford University hospital team for advice and support on healthy living. Including physical activity, diet, smoking, alcohol, and emotional wellbeing.

Telephone: 01865 221 429
(9.00am to 5.00pm, Monday to Friday)

Email: hereforhealth@ouh.nhs.uk

Website: www.ouh.nhs.uk/HereforHealth

Smokefree

For advice on giving up smoking, including how to find local support.

Telephone: 0300 123 1044

Website: www.nhs.uk/smokefree

British Red Cross

Help with independent living, transport, and mobility aids.

Telephone: 0344 871 11 11

Email: contactus@redcross.org.uk

Website: www.redcross.org.uk

DVLA

Advice about driving with medical conditions and applying for changes to license.

Telephone: 0300 790 6806
(8.00am to 7.00pm, Monday to Friday; 8.00am to 2.00pm Saturday)

Website: www.gov.uk/driving-medical-conditions

Circulation Foundation

Charity supporting those with vascular disease. Offer support and advice about a condition.

Telephone: 0207 7205 7151

Email: info@circulationfoundation.org.uk

Website: www.circulationfoundation.org.uk

Further information

If you would like an interpreter, please speak to the department where you are being seen.

Please also tell them if you would like this information in another format, such as:

- Easy Read
- large print
- braille
- audio
- electronic
- another language.

We have tried to make the information in this leaflet meet your needs. If it does not meet your individual needs or situation, please speak to your healthcare team. They are happy to help.

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