

Mr Giles Stafford



Corin
Responsible Innovation

Your hip
A surgeon's guide for patients



Important

Please be aware that the information and guidance provided within this booklet is general in nature and should not be considered as medical advice in any way. You should always seek detailed advice from a qualified medical practitioner.



Corin would like to acknowledge and thank orthopaedic surgeon Mr Giles Stafford, (The Wellington Hospital, London) for his valuable contributions in producing this guide for patients.



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Introduction

Hip pain can become a debilitating condition – not just physically but also psychologically. The restrictions or limitations it can place on your levels of activity not only take a physical toll, making it difficult to walk or sit down without pain, but the day-to-day effects of arthritis can also get you down mentally.

The information within this booklet is intended to act as a general guide to take you through the steps you can take to address your condition.

The hip is one of the most stressed joints in our body (although one which we often take for granted). It is in constant use in everyday movements such as walking, sitting, turning and even driving a car. As soon as the joint starts to stiffen or to cause pain, it becomes evident just how much we rely on it. The pain can become worse if you try to avoid using the joint, as the muscles become weak, making movement more difficult. As the joint stiffens, the load is transferred onto the low back, knee and other hip. This often causes knock-on effects in these areas.



Your anatomy

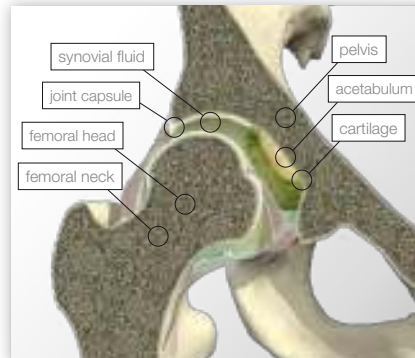
The hip is one of the largest weight-bearing joints in the body and consists of two main parts:

- The ball (femoral head) at the top of your thigh bone (femur)
- The rounded socket (acetabulum) in your pelvis

In a healthy joint, the hip allows rotation and movement of the upper leg from side to side and back to front, enabling a high level of pain-free mobility – walking, sitting, bending, turning, etc. Comprised of bones, muscles, ligaments, cartilage and tendons, each component must work harmoniously within a complex structural relationship in order to support the smooth and painless functioning of the joint.

The hip is a very stable joint – with the ball fitting into the rounded socket or cup-like cavity. Ligaments (tough chords of tissue) form a capsule connecting the ball to the socket, keeping the bones in position and helping to stabilise and control motion.

The surfaces of the ball and socket are covered by a smooth, tough material called articular cartilage, which cushions the bones and helps them to rotate more easily within the socket. Bursae, fluid-filled sacs, cushion the area where muscles or tendons glide across bone. The rest of the surfaces of the hip joint are covered by a thin, smooth tissue liner called synovial membrane. This secretes a small amount of synovial fluid which lubricates the joint, further reducing friction and facilitating movement.



Normal body movements rely on joints working smoothly and without pain – maintaining maximum joint function allows us to enjoy an active and fulfilling life.

Types of hip injury

The most common cause of joint pain is arthritis, although there are other conditions that can also cause pain or discomfort in this area.

Arthritis of the hip

The most prominent symptom of hip arthritis is pain and/or stiffness. Most patients think that their hip is in the region of the buttock or on the side (where you can feel bone) and are surprised to learn that true hip pain is most commonly experienced in the groin. The pain can radiate down the front of the thigh, to the side and into the buttock as well. Occasionally it goes all the way down the thigh to the knee – this is because the hip and knee have an overlapping nerve supply.

Patients with significant hip disease may have a limp and occasionally one leg may feel shorter than the other. As the disease progresses, the hip becomes painful and stiff. Common symptoms people notice is difficulty cutting toenails or putting on shoes and socks. Sleeping often

becomes disrupted as a result of pain. As the condition deteriorates, you may have to take a break even after walking short distances. With end-stage bone-on-bone contact, you may sometimes feel the hip creaking during walking, although most people do not wait that long before they have it replaced.



X-ray of a healthy hip



X-ray of an arthritic hip

Osteoarthritis (OA)

Osteoarthritis of a joint arises from the wearing away of cartilage. The cartilage covers the parts of the bones that move against each other. Cartilage, in combination with the body's lubricating joint fluid provides almost frictionless motion between the two surfaces. Without this protection, the bones themselves rub together which causes pain and subsequent stiffness. Patients who have early-stage osteoarthritis often notice pain at the beginning of a movement or during the first few minutes of exercise before the joints are given a chance to warm up. Once activity gets underway, the pain usually diminishes, although it is likely to increase again after resting for several minutes. As the condition worsens, pain may be present even at rest. Symptoms are generally aggravated even further in cold or wet weather conditions. Approximately 50% of people over the age of 35 display early signs of the disease. The most common causes of OA in younger adults are due to subtle developmental deformities such

as femoroacetabular impingement or developmental dysplasia (see below).

Inflammatory arthritis

Inflammatory arthritis (e.g. rheumatoid) is a condition where the body's immune system attacks the joints causing inflammation and pain. The synovium (lining of the joints) swells and joints become stiff and harder to move, especially early in the morning. There is no known cure, although various medicines can help ease symptoms. Joint replacement surgery is very effective in easing the pain and stiffness.

Developmental dysplasia of the hip (DDH).

DDH is a congenital (present at birth) condition of the hip joint, occurring once in every 1,000 babies. The hip joint is as a ball and socket. In DDH the hip socket may be too shallow. In severe cases the ball of the femur can slip either partially or completely out of the socket. Mild DDH may not be picked up until adulthood when the hip becomes painful. The issue

is that with a shallow socket, the forces going through the hip are concentrated over a smaller area, causing increased wear and arthritis.

Femoroacetabular impingement (FAI)

FAI affects the hip joint in young and middle-aged adults. It can occur when the ball shaped femoral head is misshapen and doesn't have full range of motion inside the acetabular socket, or when the socket is too deep. Both can cause damage to the labrum and cartilage inside the joint. Hip arthroscopy can be effective in treating this condition if the amount of damage is not too severe.

Slipped upper femoral epiphysis (SUFE)

This is a condition involving the end of the femur (thigh bone), where the epiphyseal plate (growth plate) weakens and the head of the femur (ball) slips downwards and backwards. This leads to the ball not being as circular as it should be, which again leads to increased frictional forces (similar to impingement) in the joint and subsequent wear.

Perthes' disease

Perthes' disease affects the head of the femur during childhood; it affects around 1 in every 20,000 children. The blood supply to the growth plate of the bone becomes inadequate and results in the bone and cartilage softening and breaking down, a process called necrosis. This can lead to the head of the femur being deformed or flattened. The effects of this can continue into adulthood and cause osteoarthritis.

Avascular necrosis (AVN)

Avascular necrosis is a disease where there is cellular death (necrosis) of bone components due to interruption of the blood supply. Without blood, the bone tissue dies and the bone collapses. If avascular necrosis involves the bones of a joint, it often leads to destruction of the joint articular surfaces.

Management

Joint pain due can detract greatly from feelings of well-being and quality of life. Many successful treatments consist of a combination of approaches designed to take into account of your own individual circumstances, needs and lifestyle, focusing on identifying ways to manage your discomfort and improve joint function. Non-surgical treatments are frequently considered first in most instances of hip pain.

Exercise and physiotherapy

Exercise and physiotherapy can help the functioning of the joint through increasing its strength and range of motion. Secondary benefits may include a raised sense of physical wellbeing through improved flexibility, heart rate and blood flow. Activities that you can do which may help include stretches, cycling, Pilates, yoga and swimming. Impact activities such as running tend to make symptoms worse and accelerate the deterioration.

Weight management

Joint pain can be aggravated by excessive weight. A healthy diet and weight loss

may help alleviate symptoms of arthritis by reducing stress on the joints and increasing function.

Medication

Medication such as painkillers and non-steroidal anti-inflammatory drugs (NSAIDs) may be used to treat the symptoms of arthritis. However, medications may only provide temporary relief, as they do not prevent further damage to the joint.

When non-surgical treatments no longer offer sufficient pain relief and the discomfort and disability are having serious effects on your daily activities, it may be time to consider surgery. Various operations are available to you depending on how badly your hip joint is damaged or worn. Treatments include targeted injections, arthroscopy (e.g. keyhole surgery to clear away loose tissue or reshape bone abnormalities inside the joint) or hip replacement.

Hip replacement surgery is a very successful procedure. It is certainly one of, if not THE most successful operations

in all fields of surgery, with a very low risk profile and excellent results. However, some people delay surgery due to fear, misinformation or a lack of awareness about their treatment options. There is no cure for arthritis and it is also progressive, meaning that pain and mobility are likely to get worse over time.

It is important to weigh up the risks and benefits before deciding to proceed with surgery. Potential benefits may be significant, including the removal of pain, an improvement in mobility and a return to a more active lifestyle. All surgery involves some element of risk though and complications can occur. These include blood clots, medically termed deep vein thrombosis (DVT) and/or pulmonary embolism (PE), infection, leg length discrepancy, fractures, nerve injury, and dislocation (where the new head is forced out of the socket). Ceramic on ceramic bearings can occasionally squeak, although this does not necessarily mean there is anything wrong with it. It is important to discuss these with your

surgeon before you make a decision. Always remember that you, the patient, have the final decision on whether to go ahead if hip surgery is offered.



Surgery

During a total hip replacement (THR), the arthritic or damaged joint is removed and replaced with an artificial joint that moves just like a healthy hip. Both the head of the femur (ball on-top of the thigh bone) and the acetabulum (hip socket) are both replaced. A metal stem (often titanium) is implanted into the femur and femoral head is replaced with an artificial ceramic ball, which attaches to the metal stem. The hip socket (into which the ball fits) is replaced with a titanium shell with an artificial liner made of ceramic or hardwearing polyethylene (which sometimes can be fixed directly with bone cement). These surfaces that move together are known as the 'bearing' and allow for smooth and painless movement of the ball in the socket.

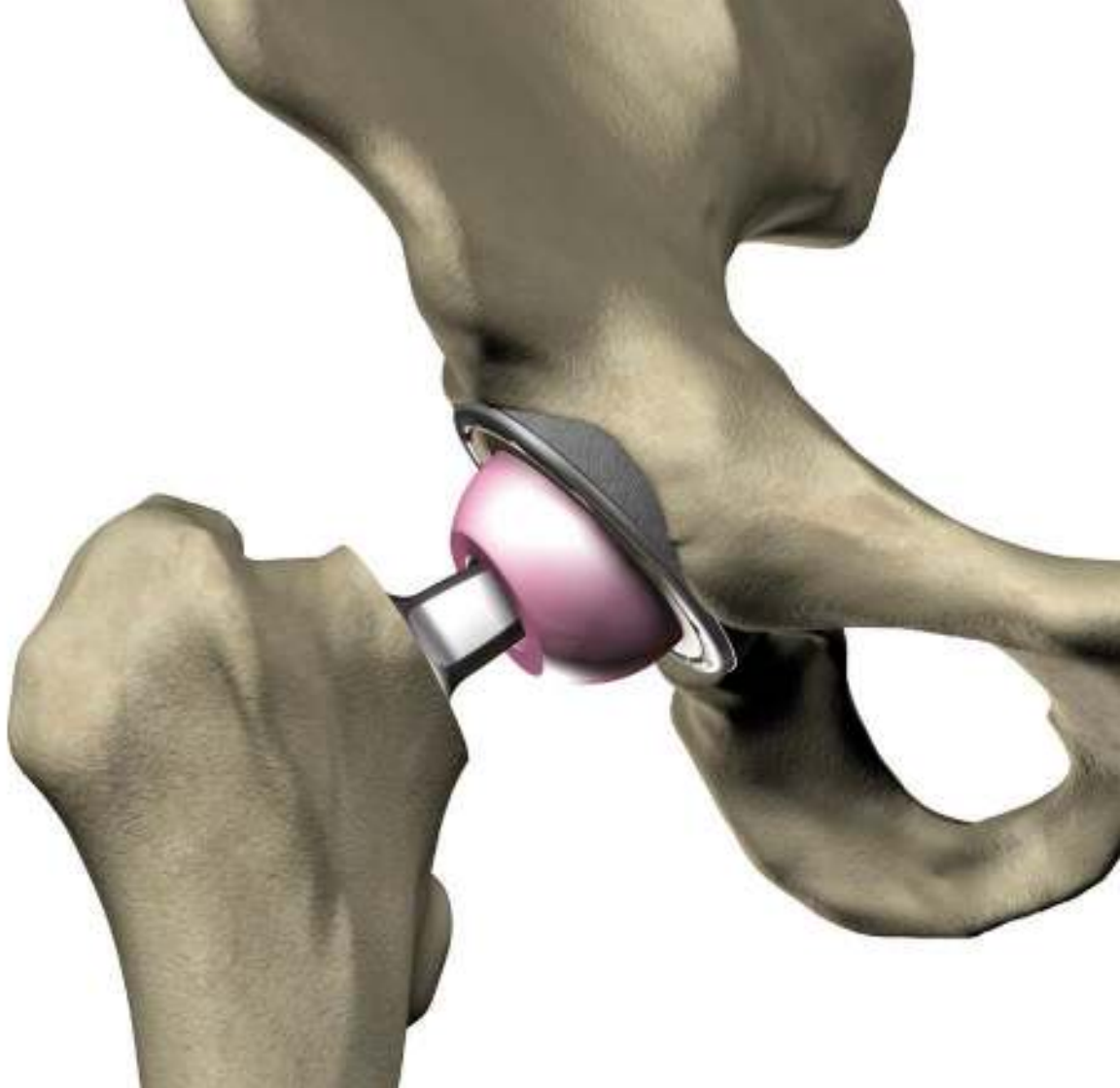
The artificial joint may be cemented in position or press-fitted securely in place without cement (uncemented). The length of stem used in THR can also vary from traditional, longer stems to shorter contemporary, bone conserving stems.

What type of replacement is right for you? Different options for hip replacement are available and can be summarised as follows:

- Short stem THR
- Uncemented THR
- Cemented stem (hybrid) THR
- Fully cemented THR

Not all procedures are appropriate for all patients. Mr Stafford will advise on the most suitable type of hip replacement dependent on your age, sex, bone quality, anatomy, underlying disease and functional demands. More information on the different types can be found over the following pages.





Short stem

A short stem hip replacement uses a shorter femoral implant (in comparison to the longer stems used in traditional THR). The acetabulum (socket) is replaced as normal with a bearing suitable to the patient.

Mr Stafford uses MiniHip™, which is a clinically proven, bone-conserving implant. Its shape provides a natural fit inside the femur and a better distribution of the load compared with some conventional femoral stems. This improves revision options for patients who may need further treatment in later life.



MiniHip™



Uncemented

'Cementless' or 'uncemented' stems do not require bone cement in order to fix them in place – the surface of the implant is instead covered in a special (hydroxyapatite) porous coating which helps to fix the prosthesis securely in position. Over a few weeks, the patient's natural bone grows through the pores, attaching the artificial joint to the hip's natural remaining bone structure. Cementless hydroxyapatite coatings are used on both short stems and longer, traditional stems.



MetaFix™ | TriFit^{TS}™



Cemented and hybrid

Cemented

Cemented total hip replacements are considered gold standard in many countries. The stem is fixed in position inside using bone cement, which holds it securely in position inside the femur. These types of hip replacement have been shown to last many years, but may not always be suitable for younger more high-demand patients.

Hybrid hip replacements combine the use of a cemented femoral stem with an uncemented acetabular cup. The benefit of this is that it allows the use of more contemporary bearings such as ceramics.



Cementless acetabular shell

An artificial acetabular 'cup' or 'shell' sits inside the hip socket, and provides a new surface for this section of the hip joint. The ball at the head of the femoral stem fits inside this shell.

Mr Stafford prefers Corin's Trinity™ acetabular system. This consists of a titanium hemispherical shell with an inner polyethylene or ceramic liner. It is an 'uncemented' design utilising the hydroxyapatite coating mentioned above. Over time, the natural bone grows through the pores, attaching to the hip's remaining bone structure. The inner polyethylene or ceramic lining articulates against the ball at the head of the femur, allowing for smooth movement of the artificial joint.



Trinity™

Optimised Positioning System (OPS™)

This is an innovation designed to improve the long-term outcome of hip replacements. The rationale is to determine what exact angles the acetabular shell should be placed in the pelvis, determined by your own anatomy and the way you move. It requires three extra x-rays and a CT scan over the normal imaging that is required for pre-operative planning. A personalised instrument is manufactured (3D printed) which fits inside your pelvis and uses a laser to indicate where Mr Stafford and the analysts and have agreed is best for you. Mr Stafford may offer this to you if he feels that your case is suitable. However, it takes about four weeks to manufacture and also exposes the patient to more radiation (from the x-rays and scan) than normal. However, early research has demonstrated that this system may reduce the risks of squeaking and dislocation following surgery. It is important to understand what to expect at your operation and what you need



OPS™ Optimized
Positioning System

Organising surgery

to do beforehand to ensure that you are prepared when the time comes.

Mr Stafford will assess you and discuss whether a THR is an appropriate treatment option. If so, you will also discuss which implant is the most suitable. Once your operation is scheduled, you will be asked to attend the hospital for a pre-operative assessment.

Remaining active while waiting for your surgery is an important key to success as the stronger and more flexible you are, the quicker you will recover. Activities such as walking, range of motion exercises (via physiotherapy, yoga or Pilates) and swimming can help you stay strong and flexible.

If you are a smoker, you should try and give up at least six weeks before to help reduce the risk of complications such as infection and deep vein thrombosis (DVT).

All infections (e.g. in-growing toenails, urinary tract infections, chest infections)

should be cleared up prior to surgery to prevent infection from spreading and affecting your new joint. You must say if you suspect you have an infection, as your surgery may need to be rescheduled.



Before your operation



Two weeks before

You will be invited to attend a pre-operative assessment (POA) clinic. A detailed assessment will be carried out and full medical history taken. Various physical examinations will be undertaken such as heart monitoring, X-rays and blood and urine samples to ensure that you are fit to proceed with surgery. You will be asked to bring details of any medications you are taking to this meeting, take along a list or the packaging.

You will be given advice on anything you can do to prepare for surgery and will be asked about your home circumstances so that your discharge from hospital may be planned. If you live alone, have a carer, or feel you need extra support, tell the team so that help can be arranged before you go into hospital. For patients in the UK, you will also be asked if you are willing for details of your operation to be entered into the National Joint Registry (NJR) database. The NJR collects data on hip and knee replacements in order to monitor the performance of joint implants. Use this session to discuss any further concerns you may have about

your surgery, preparations beforehand or recovery afterwards.

There are a number of things you can do beforehand to prepare for your operation to make your stay in hospital and your return home go as smoothly as possible:

Take responsibility for finding out as much as you can about what your operation involves – there is a wealth of information on the internet (see ‘Further resources’ at the end of this booklet) or ask your hospital what leaflets or videos they may have that you could look at. However, be cautious that not everything you see and read may relate to you or your care.

Ensure you arrange transport back from the hospital as you will not be allowed to drive yourself home; line up a friend or relative to help you at home for a week or two.

You may wish to stock up on food that is easy to prepare such as frozen meals,

cans and staples such as rice and pasta.

- Before leaving home, have a long bath or shower, cut your nails (remove any nail polish), wash your hair and put on freshly washed clothes. This helps prevent unwanted bacteria coming into hospital with you and complicating your care.
- Ensure that you take along everything you need for your stay in hospital:
- Personal belongings including toothpaste, toothbrush, hairbrush, comb, face cloths, towels, deodorant, soap, shampoo, shaving equipment, underwear, robe.
- Slippers or flat, rubber-soled shoes for walking.
- A tracksuit or other suitably loose-fitting, comfortable garment for daywear in the hospital and for wearing home.
- Any medication you are currently taking, together with a list to give to the nursing staff detailing necessary strength, dosage and timings.

Remember your inhaler or nebuliser if you suffer with asthma.

- Leave all valuables such as jewellery, credit cards, cheque books and any other items of personal value at home. Wedding rings may be left on as these will be taped up prior to going into theatre.
- Take a small amount of money for newspapers and magazines etc.

You should not eat or drink anything for six hours prior to surgery.

The operation

You will normally be admitted to the hospital on the day of surgery. At this time you may expect the following to happen:

- A member of the nursing staff will show you to your room.
 - You will be given an ID bracelet and be asked if you have any known allergies. If this is the case, you will be given an additional red bracelet that alerts the rest of the team to this.
 - You will be measured for a pair of surgical stockings to wear (these will be put on by the nursing staff if you have difficulty) to help reduce the risk of blood clots.
 - The physiotherapist may visit and discuss a post-operative exercise programme to mobilise you as soon as possible after surgery.
 - The anaesthetist will visit you to discuss the anaesthetic. He/she will enquire about your general health, whether or not you are a smoker, whether you currently wear contact lenses or have any dental crowns.
- Mr Stafford will go through a consent form, which you will need to sign. This shows you understand the procedure and the risks, and are in full agreement for Mr Stafford to proceed.
 - An arrow will be applied just above the knee to mark the leg that is to be operated on.

You will not be permitted anything to eat or drink for approximately six hours before your operation. Ward staff will help you to put on a surgical gown if you need it. You will also have to remove make-up, nail polish or jewellery (it is advisable to leave valuables at home). If you wear glasses or false teeth, these can be removed in the anaesthetic room if you wish.

Your anaesthetist will already have been to see you to go through the process. You will be taken from the ward to the operating theatre and, before going into theatre; you will be taken into the anaesthetic room, accompanied by a

nurse. You will be asked a number of questions from a checklist which you will already have answered, this procedure is therefore purely to double-check.

Three sticky patches are applied to the chest area, which allow the heart to be monitored during surgery. A small plastic tube (cannula) is inserted into a vein, usually at the back of the hand. This is taped in place and is the route through which all necessary drugs will be injected.

You will be given either a general anaesthetic where you will be sent to sleep, or a local anaesthetic injection such as a 'spinal' or 'epidural' in your back that we prefer. With the latter kind you can remain conscious throughout the procedure although we prefer to give you sedation so that you are sleepy and not aware of the operation going on. The benefit of this is that you will not feel as sick or nauseous after the operation allowing us to get you up and going much faster (which reduces the risk of blood clots). Which type of

anaesthesia you receive depends on your situation as well as your surgeon's and anaesthetist's recommendations – discuss this with them beforehand if you have any concerns regarding this.

With both general anaesthetic and sedation, once the sedative is injected, which normally feels slightly cold, you will begin to feel drowsy. You may be asked to count backwards from ten; invariably you will be asleep well before you reach the number one.

The leg being operated on will be scrubbed with an antiseptic solution and your whole body covered in sterile drapes. Once ready to start, Mr Stafford will make an initial cut along the side of the hip.

The upper part of the hip (femoral head) is removed and the natural socket (the acetabulum) is hollowed out. The replacement socket is fitted into the pelvis. The stem, with a ceramic ball on its upper end is placed into the femur. The hip is then put back together and tested

for stability. Mr Stafford will also inject a local anaesthetic during the procedure for additional post-operative pain relief. When happy with the leg length and stability, the joint capsule and tissues are closed. Mr Stafford always uses dissolvable stitches with a layer of skin glue to seal the wound before a water resistant dressing is applied.

The length of surgery may vary, but usually about an hour depending on implants used and complexity.



Immediately after your operation

To manage your own expectations about how quickly you will be 'back on your feet', it is important to understand what will happen both immediately after your surgery and in the months that follow.

When you leave the operating theatre, you will usually have an intravenous drip in your arm for fluids and any necessary drugs. You will be taken to a recovery room where you will remain until you are fully awake and the team are happy that your condition is stable. At this point you will be taken back to the ward. You will be mobilised about four hours after the procedure has finished with the physiotherapists or nurses, initially with a frame and then with crutches or a stick. You may also utilise an exercise bike (if available) with the physiotherapists. The cannula is usually removed within 24-48 hours. It is important to sit out of bed as much as possible and walk as much as you can. You should wear your own clothes the day after the operation and the remainder of your stay in hospital.

An x-ray will be performed either on the same day or next day following surgery to double check the position of the implants. A blood test will be performed on day two post-operatively unless otherwise indicated. It is extremely unlikely that you will need a 'top-up' blood transfusion, but occasionally it is needed, especially in older patients.



Physiotherapy and occupational therapy

As mentioned previously, you will see the physiotherapist during your hospital stay and he/she will help you to get moving again, also advising on exercises to strengthen your muscles. You will receive guidance on the standard 'dos and don'ts' following hip surgery – for example, how to get in and out of bed, climb stairs, use the shower, etc.

The exercises recommended by your physiotherapist are a crucial part of your recovery, so it is essential that you continue to do them. There are certain combinations of movements that you should avoid during early recovery; your physiotherapist will give you advice and tips to protect your new joint. However, the movement to avoid is a combination of deep flexion, bringing your knee across the front of your body and rotating the leg outwards.

Mr Stafford does not use 'routine hip precautions'. This is because studies have shown that they do not have an effect of post-operative dislocation rates.

Any extreme of motion has the potential to dislocate your new hip, but as long as you are sensible, this is very unlikely to happen. You do not have to sleep on your back for six weeks. We are very happy for you to sleep on your unoperated side with a pillow under your knee for comfort.

The occupational therapist will provide information on whether you need any help at home and offer advice on how to maintain independence in your daily life. He/she will assess how physically capable you are and assess your circumstances at home when you are about to leave hospital – they may also be able to provide specialised devices to help around the home. However, raised toilet seats and chairs are not needed unless you are very tall, when you may find them more comfortable for a week or two.

Leaving hospital

The overwhelming majority of patients are ready to leave hospital after two or three nights. Occasionally, some patients are ready to go home the next day, but it is natural to feel apprehensive after your surgery about going home. How quickly you return to 'normal' will also depend on the individual – your age, overall state of health, muscle strength, etc.

An outpatient appointment will be made to see Mr Stafford about two-weeks post-operatively. This is mainly to check the wound and ensure everything is going to plan. A further appointment is made at the six-week mark following surgery. This appointment is a routine check-up and a check x-ray may also be performed at this point.



The first few weeks

Once you return home, you may need to continue to take painkillers if needed. You will also be given approximately five weeks of tablets to thin the blood to try and prevent blood clots forming. We also advise to continue to wear compression stockings that you will have been given for a further few weeks until you are fully mobile. These can be difficult to put on and take off, so you may need someone to help you with this.

Some patients experience swelling on the operated side, but this usually disappears quite quickly. Mr Stafford will remove your dressing at your outpatient appointment after two weeks. At this point, you may clean the wound and in the early period it can be beneficial to rub moisturiser into the area to help disperse the swelling and help the healing process. A few patients may experience clicking or other sounds from their new hip, but this is not abnormal and usually disappears after a short time.

You must take care to avoid dislocating your new hip and not try to test your new joint to see how far it will go. The joint capsule and muscles need time to heal and recover. Again, the movement to avoid is a combination of deep flexion, bringing your knee across the front of your body and rotating the leg outwards.

Initially you will tire more easily, not least because there will continue to be traces of anaesthesia in your body for some time.

You should contact your doctor immediately in the case of any undue pain, severe redness around the operation site or drainage from the wound.

Walking without the aid of a stick is often possible from about two weeks after surgery, although this will be determined by your confidence and progress and you should follow the advice of Mr Stafford or your physiotherapist. Your return to driving depends on your strength and reaction times. You must be safe to perform an emergency stop if necessary.

We advise that you check with your insurance company as some also have stipulations. Your return to work will also be determined by you.

Improvements can continue for a year or more, depending on your condition prior to surgery. It is important that you take regular exercise to build up the strength of the muscles around your new hip. However, it is essential that you listen to the advice of your physiotherapist as to the suitability of different forms of activity so as to avoid damaging or dislocating the new joint.

By around 8 weeks it should be possible to perform exercises such as cycling, swimming, golf or gym classes. It is generally advised to avoid rigorous sports that put undue stress on the joint. However, you will be able to return to almost all previous normal pastimes within a few months of your operation. Ask Mr Stafford if you are unsure about the suitability of any activity.

Further resources

For more information go to **www.coringroup.com**. You may also find the following websites helpful in continuing your research:

- Association of Anaesthetists of Great Britain and Ireland
www.aagbi.org
- American Academy of Orthopaedic Surgeons
www.aaos.org
- Arthritis Foundation
www.arthritis.org
- Arthritis Care
www.arthritiscare.org.uk
- Australian Orthopaedic Association
www.aoa.org.au
- British Orthopaedic Association
www.boa.ac.uk
- The European Society of Regional Anaesthesia and Pain Therapy
www.esraeurope.org
- Joint Action
www.jointaction.org.uk
- National Institute for Clinical Excellence
www.nice.org.uk
- National Joint Registry
www.njrcentre.org.uk
- Pain Concern
www.painconcern.org.uk
- Royal Association for Disability & Rehabilitation
www.radar.org.uk
- Royal College of Anaesthetists
www.rcoa.ac.uk

The organizations above are independent of Corin Group PLC. Corin does not recommend any service or product you may find on these sites and does not guarantee the accuracy of information.

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