

# Hip Replacement Surgery – Complete Guide

This guide will help you in understanding the hip replacement procedure.

## I. Diagnosis and Qualification

### 1. Main reasons for the hip replacement

The main symptom leading to consideration of hip replacement procedure is a chronic hip pain. Usually, it is caused by arthritis – osteoarthritis, rheumatoid arthritis and traumatic arthritis. Sometimes is the serious injury such as break of the hip bone in the older age, or inborn diseases/changes.

- **Osteoarthritis** is a medical condition caused by ageing or obesity that occurs mostly in people over 50 years old. The hip joint simply is used up – the cartilage and the bones rub each causing symptoms like strong hip pain and stiffness. As a result of combined all of the loads and forces affecting the cartilage, it loses the cushioning ability. Other reason of osteoarthritis may also be an incorrect hip development in the childhood. Sometimes the early symptom of the hip osteoarthritis is a radiating knee pain.
- **Rheumatoid arthritis** - An autoimmune disease which leads to a chronic inflammation of the hip joint, in which the synovial membrane becomes swollen and thickened. It can damage the whole joint by distortion and deformation, which is followed by limited mobility, cartilage loss, intense pain and progressive physical disability. Most common symptoms are the hip pain, increased pain while walking, decrease range of motion.

- **Post-traumatic arthritis** - Sometimes the serious injury can lead to arthritis – the cartilage can be damaged causing hip pain and stiffness. In elderly age, usually as a result of osteoporosis, it comes to femoral neck fracture.
- **Inborn changes** – leading to abnormal joint biomechanics and accelerated the destruction of cartilage. In some cases even if the infant hip problems are treated properly, they may still cause arthritis in older age.
- **Avascular necrosis** –is the death of bone tissues as a result of lack of blood supply. The blood flow to a bone section can be interrupted by a bone dislocation or fracture.

## **2. Am I a good candidate for the hip replacement surgery?**

As the recommendation is fully individual and based on Patients condition including pain and disability, there are no age restrictions. If the Patient's overall health is good, the surgery can be performed on a 90 – year old. Most Patients are between 50 to 80 years old, but sometimes younger people with arthritis also need this procedure. There are also no weight restrictions, but if you are overweight, your surgeon may ask you to lose some pounds, as the pressure influences your hip and the implant. As the surgery is irreversible, it is addressed to people who can truly benefit from it. If your:

- Hip pain makes it impossible to walk, stops you from your daily routines,
- Pain is also intolerable at night or while resting,
- The relief from other supports available is not insufficient (including painkillers, anti-inflammatory drugs, psychotherapy).

### 3. What does my orthopaedic surgeon need to know?

Before the surgeon agrees to the hip replacement procedure, he needs to evaluate many factors carefully. The first thing is to investigate your medical history to see if your general health lets you undergo this complex surgery. He will ask questions and make some general tests like blood samples, urinalysis, EKG. He will examine the level of your hip problem, how it affects your daily activities, how burdensome the pain is. During the physical examination, your orthopaedic surgeon needs to assess your hip mobility, alignment and strength; It will be not possible without precise imaging tests like MRI and X-Rays. You will be asked for the:

- Ortho- X-Ray (image physique of the lower limbs and pelvis) – in order to assess leg length,
- Hip MRI,
- X-RAY axial with the evaluation of articular labrum alpha and beta angle,
- X – RAY pelvis with joints,
- Valid hepatitis vaccination.

#### **4. You should talk with your Doctor**

You will both decide if the hip replacement surgery is the best method to improve your life satisfaction – increase mobility, relieve pain. There are always non-invasive methods to try first – medications, physical therapy, exercises. Your doctor will explain in details potential benefits and risks related to the surgery. If you have any doubts – you should always ask; if a medical term is not clear, or you are not sure about some details.

More than 90% of Patients experience a great pain reduction, and after a rehabilitation process can get back to daily activities without soreness.

## II. Procedure



### 1. General information:

Hip replacement is a procedure in which a prosthetic implant replaces your joint. Depending on the case it can be performed as a total or partial replacement. Most common indication for this surgical procedure is a strong arthritis pain. Arthroplasty is considered to be one of the most significant medical achievements of the last century. It is a chance of returning to full fitness – it can be a life-changing procedure for someone who is debilitated by severe joint damage.

If you are suffering from arthritis, or your hip joint has been damaged by a fracture, or you have been injured in an accident, the daily activities such as walking, sleeping or even resting in a chair may become painful and tiring. If your hip is stiff and you feel uncomfortable you may consider a hip replacement. Your doctor will try a medication therapy, walking support or physical therapy in the first place but if those are not helping, it may be necessary to consider the hip replacement.

#### Facts:

- >90 % – number of successful procedure outcomes around the world
- 310,800 – number of total hip replacement procedures performed in the United States in 2010
- 160,000 total hip and knee replacement procedures performed each year in the UK
- 1960 – first arthroplasty surgery was performed

## 2. Benefits:

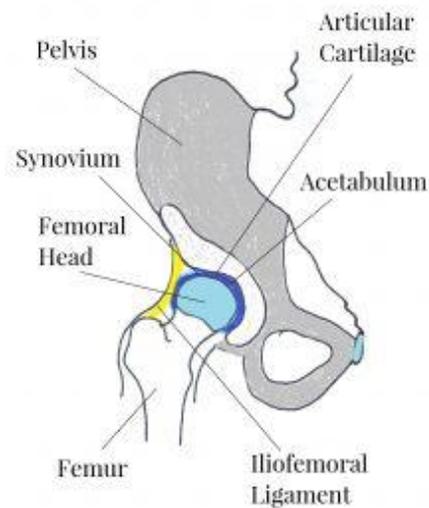
- Significant pain reduction – no necessity of taking painkillers.
- Returning to daily activities or even sports (biking, golf, swimming, Nordic walking etc.)
- Achieving back a full range of motion in your hip,
- Painless sleeping,
- Reduced risk of diabetes, heart problems, depression,
- A better social life
- A better intimate life

Bare in mind that total hip replacement is a very complex, irreversible surgical procedure and always carries a risk of complications, that is why **we recommend choosing an experienced surgeon**, and a clinic using the modern type of prosthesis.

### 3. About the procedure:

In total arthroplasty both the acetabulum and the femoral head are replaced while in partial hip replacement (hemiarthroplasty) the implant replaces only the femoral head.

#### Anatomy of the hip



The hip joint is one of the largest and most important joints in the human body. It is crucial for any activity – walking, running, jumping and even sitting. It is one of the most flexible joints (except the shoulder) with a great range of motion (360 degrees). Hip is a ball-and-socket synovial joint located between the hip bone and femur. The socket for the hip joint is formed by a cup-shaped structure called acetabulum.

- The rounded head of the hip bone forms the ball of the joint.
- Hyaline cartilage acts as a shock absorber during movements as well as provides a smooth surface for the bones to glide. The synovial fluid lubricates the whole capsule.
- Around the joint, there are many tough but elastic ligaments preventing dislocation.
- Not only is the joint flexible, but also it supports half of the body weight.

#### 4. Procedure description:

The whole hip replacement procedure involves removing damaged bone and cartilage and replacing it with implants (prosthetic components). This process is complex and precise and takes a few hours.

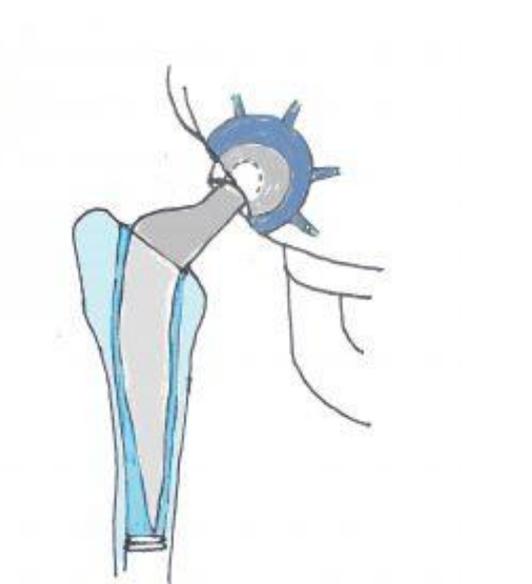
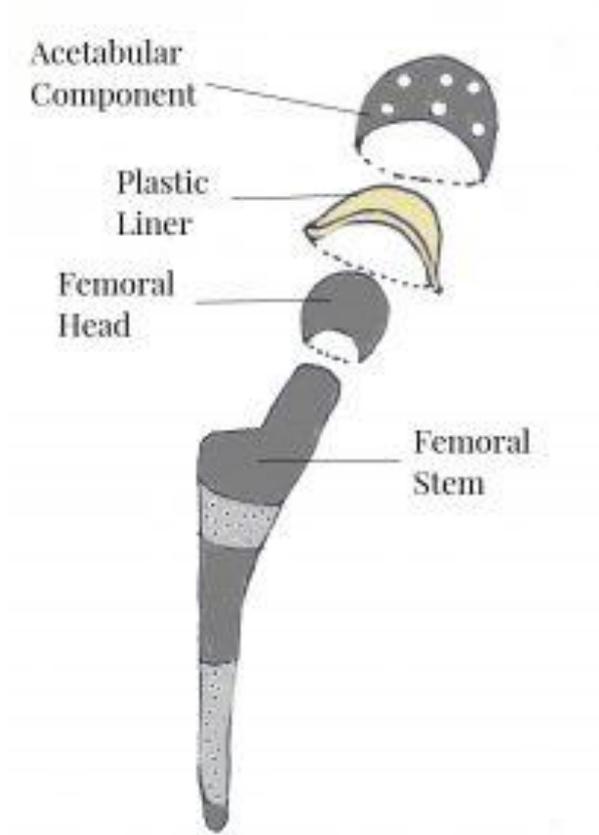
1) In the first step, the surgeon removes the damaged femoral head and replaces it with a metal stem. The femoral stem is placed into the hollow centre. It may be either press fit or cemented.

2) The surgeon places the ball (made from metal or ceramic) on the upper part of the stem instead of the damaged femoral head.

3) The surgeon also removes the damaged cartilage surface of the acetabulum (the socket) and places the metal implant instead.

4) To keep the component in place sometimes a cement or screw is used.

5) To achieve a smooth gliding surface, the spacer made of plastic, ceramic or metal is placed between the two new parts – ball and socket.



*Graphics: Implant components, the implant fitted into the hip joint.*

As the procedure is quite aggravating to your body, you will need several days in the hospital to recovery and rest. It is also important that the anesthesiologist or nurse is with you to moderate pain. You must protect your hip during the early phase of the recovery process – you should use a pillow to keep your leg in the right position. You can read more about the post-surgery care in **our free handbook about managing at home with hip replacement**.

Hip arthroplasty is considered as a safe procedure with the overall low rate of complications. Serious problems as infection happen in less than 2 % cases, but the chronic illness (especially heart problems) may increase the potential risks such as stroke – it is the matter of adhibiting a general anesthetization. There is always a risk that any of the followings may appear:

## 5. Possible Complications

- **Infection**– During almost every invasive procedure such as a hip replacement surgery, there is a risk of an infection. It can be a general infection, a wound infection, or an infection around the prosthesis. It may occur a couple of days after the procedure, but may also occur months later. Minor infections are treated with antibiotics and usually should not cause concern. Major infections, especially in the wound or deep around the prosthesis may lead to a surgical intervention and in utmost cases even the implant removal. Infections rate is very low, less than 1 percent.
- **Thrombus (Blood Clots)** – Our blood is liquid when it flows through the veins in our bodies. But when we wound ourselves it has to stem the bleeding by creating a clot. Sometimes it may happen inside our bodies, for example after extensive surgery, where many body tissues are violated. It may break free and travel to your lungs or heart causing a disaster. Your surgeon will outline a prevention program – there are effective injections that rarefy your blood.
- **Inadequate leg length** – Our body is unsymmetrical. Your orthopaedic surgeon will make every effort to adjust the implant length so your legs lengths are even, but sometimes one leg may feel shorter than the other. Sometimes it is done by purpose to maximise the biomechanics and stability of the hip.
- **Hip implant dislocation** – you need to treat your new hip carefully during the early recovery process. The tissues surrounding the hip are healing and are not that resistant. Sometimes because of incorrect leg position the ball jumps out of the socket. It happens uncommonly, in most cases, it is possible to locate it back on the place without any surgical intervention.
- **Loosening of the implant** – due to daily activity or osteolysis your implant may become loose over the years. If this is painful, your surgeon may consider a revision surgery.
- **Heterotopic Ossification** – is the process of bone forming outside the skeleton, which causes the calcification of soft tissues. Usually, it occurs in the body regions where trauma has occurred. In the hip replacement case, the muscles around the hip can become stiff. Typically the anti-inflammation drugs and some low-radiation are enough to treat this problem.

- **Periprosthetic Fractures** – small breaks of the bone around the implant. As it can weaken the bone may also cause the implant to fail. Usually, fractures are caused by osteoporosis or medications. It may occur in less than 1 % of hip replacement surgeries and 4 % of revision surgeries.

## 6. Type of implants

There are two main prosthesis types:

- **A cemented hip prosthesis**
- **A non-cemented (cementless) hip prosthesis.**

A cemented hip implant is fixed to the bone using “a bone cement” (typically acrylic polymer called polymethylmethacrylate (PMMA)) which is a specialised and body safe glue. This type is usually more common among elderly Patients who suffer from osteoporosis or rheumatoid arthritis.

A non-cemented prosthesis (also called press-fit) is implanted into the bone and owing to its special texture the bone grow onto it over time. It is usually used in younger Patients, who have a good bone substrate. Some prosthesis components are attached to the bone with screws or pegs to keep the implant in place until the bone grow onto it.

Each prosthesis used for hip arthroplasty consists of two parts: one which embed in the pelvis (in the place of the hip joint socket) and the femur part which replaces the head and neck of the femur.

As constantly the age of people who want the highest mobility level, the best life quality, and require the hip prosthesis surgery is decreasing, surgeons recommend partial replacements – resurfacing. The bone loss during the placement is much lower, as it only restores the joint surfaces. Some doctors believe that it is better to use the classic implant but with the shorter pin – after the bone growth, it allows a high physical activity.

## **Cemented Joint Prosthesis:**

### **Benefits and Risks / Advantages and Disadvantages**

#### **Advantages:**

- The surgeon can affix the hip implant components also to the bone that is porous due to an osteoporosis
- Lower risk of infections – The surgeon can add a small amount of antibiotic material to the cement.
- The bone cement dries in 10 minutes, so right after the surgery, the Patient can be sure, the implant is in the right place.

#### **Disadvantages:**

- Over time the bone cement may degrade, and small bits of cement can break off from the prosthesis causing some problems: the prosthesis may become loose, the small bits can cause inflammation, in extremely rare cases the bit can enter the bloodstream
- This little parts of cement can be removed arthroscopically to prevent symptoms.

## **Non – Cemented Joint Prosthesis:**

### **Benefits and Risks / Advantages and Advantages**

#### **Advantages:**

- A large percentage of surgeons prefer non-cemented hip prosthesis components because it offers a better bond with the bone. It also eliminates the risk of breaking down of the cement.

### **Disadvantages:**

- It only can be used in Patients with healthy bones. Osteoporosis is a precluding factor for this kind of prosthesis.
- It takes time until the bone grows into the implant – Patients should not put their full weight on the hip joint unless it is fully grown into the bone.

### **Implant Components**

Hip implants are produced by many companies and each has an own design. Usually, the ball component is made of ceramic or highly polished metal, and the socket is made of plastic, ceramic or metal.

### III. Pre-Operative Preparation

#### 1. Pre-Surgery Preparation

To minimize the possibility of complications and to achieve the best outcome and recovery in a quick and comfortable way, you should prepare yourself in three main areas:

- Your body,
- Your mind,
- Your house.

We have divided this part into three sections.



## 2. Body Preparation

The most important case is the medical evaluation. You will make the decision together with your orthopaedic surgeon. You will be examined carefully to ensure you are healthy enough to undergo the hip replacement surgery. If you suffer from any chronic illness, you should also be evaluated by a specialist, such as a neurologist or a cardiologist.

- You will need to undergo several tests such as blood and urine samples, MRI, hip and legs X-Rays, EKG, sometimes a chest X-Ray may also be needed.
- You should not have any active infections in your organism, as it can quickly spread through the bloodstream – skin infections, urinary infections, general infections, flu
- You should have a dental evaluation done – a bacteria may enter the bloodstream during dental procedures, so you should take care of your teeth before undergoing a hip replacement.
- You will need to control the chronic illnesses and talk through each one with your doctor.
- You will be measured and weighted by your doctor and asked to lose some weight before the procedure. A hip joint will be less stressed and loaded if your body weight will be lower.
- You will be asked to stop smoking – smoking causes 50% higher risk of post-surgery infections and respiratory complications.
- You will talk with your doctor about the medications you are taking. He will decide if you should continue or stop taking some of them.
- To prepare your body, you should wash with a chlorhexidine shower gel.
- In some cases, you may be advised to donate your blood before the surgery. It will be stored in case you will need it after the procedure.

### 3. Mind and social preparation

- You are doing an excellent step right now – familiarising yourself with surgery details and information. You should not have any doubts – please ask your doctor or a medical team everything that bothers you. When it comes to health, there are no silly questions.
- You should talk to your Family and close people – although you will be able to walk with a walker or crutches in a very short time after surgery, you will still need some help with other daily tasks – shopping, bathing, cooking. If you live with someone, discuss if this person will be able to help and assist during physical therapy exercises as well as give emotional support. If you live alone, we recommend inviting a social worker or a nurse. We encourage to extend the care facility during your early recovery and use a rehabilitation centre, sanatory or extend your stay in the hospital.



## 4. Home preparation

After the surgery, it will take time since you will be fully physically fit. You should prepare your apartment for the recovery time:

- It is recommended to arrange a living space on one house level – right after the surgery you should avoid stairs.
- You should prepare stable, comfortable and hard-surface chairs with the seat over your knees level. Armrests will also be useful.
- You should remove all carpets.
- You should remove all items which may interrupt while walking with crutch or walker.
- You should remove all electrical wires from your walking ways.
- You should fasten safety bars or handrails in your bath or shower
- You may need a small chair for bathing and a long -handled sponge
- You may need a raised toilet seat
- You should set up a “recovery centre”, a place at home with a comfortable chair and a table with all of the necessary items reachable (remote control, phone, books, medications, water).
- It is a good idea to prepare and freeze meals earlier, so you (or your attendant) can easily cook them. Make a bigger grocery shopping before your surgery, as you do not need to go out. Remember also about your prescriptions medicines and a sick leave documents.



## 5. Pre- Hospital Preparation

### What shall I take to the hospital?

- Comfortable sneakers (without laces),
- Loose and comfortable pyjamas (night dress),
- Loose and comfortable daily clothes,
- Towels,
- Hygiene products,
- Outwear clothes for a way back home,
- Currently used supporting equipment for walking,
- Medications,
- Your currently used glasses, hearing aid, dentures,
- Long – handle items (sponge etc.),
- Leg rails if used,
- Still water, snack that does not need to be stored in the fridge,
- House keys,
- A small amount of money to use in the hospital shop (it may be necessary to buy an orthopaedic leg protection).

### Do not take with you to the hospital:

- Valuables, jewellery
- Big suitcases
- Foods which need to be stored in the fridge



## **IV. Post-Operative Care**

### **1. Pain management**

As the hip replacement is a complex and invasive surgery, it is natural that you will feel some pain afterwards. This is a part of the healing and recovery process.

Your medical team – surgeon, anesthesiologist and nurses will do their best to reduce your pain sensations so that you could rest peacefully and recover faster. In the most cases, your doctor will prescribe painkiller medicines (sometimes opioids, non-steroidal anti-inflammatory drugs). If your pain has not begun to improve 14 days after surgery, you should talk to your GP.

The overall success of your surgery will depend on your involvement in the rehabilitation and care process during the first crucial weeks after the surgery.

### **2. Wound Care**

To get into your hip, the surgeon will need to make an incision in the skin, which will be closed with stitches to help the skin to grow together. Stitches will be removed about 10-14 days after the surgery. Try to keep the wound dry until it has thoroughly sealed. You should use a bandage to prevent the wound from irritation. Cover the wound with the waterproof bandage while showering.

### **3. Proper diet**

Right after the surgery, you will probably have less appetite than usually. Remember that your hip tissues need a balanced diet and an iron supplementation to heal properly as well as a good hydration.

### **4. Preventing Pneumonia**

It is very important to take frequent deep breaths in order to keep your lungs healthy. Due to an increased time spent in bed as well as anaesthesia you may feel that your breath become shallow. It can lead to pneumonia. To prevent this, you should do some breathing exercises.

## **5. Compression socks**

These are high and tight socks helping your blood to circulate and prevent from retention of the fluid in the lower legs. You should wear them up to 6 weeks from the surgery.

## **6. Convalescence and resting**

Convalescence after such a complex surgery may take some time. You should not overtire your body. We recommend a nap during the day, or 10-15 minutes breaks during your daily activities.

## **7. Protection**

Although your new hip was designed for all the daily activities, you should avoid strenuous and high impact sports. Walking, biking, swimming are a great solution for you. To keep your hip replacement in good condition you should take special precautions to avoid injuries, especially falls. You should exercise regularly and even if everything seems fine you should visit an orthopaedic periodically. To prevent infections you should also inform your dentist that you have a hip prosthesis – he will prescribe an antibiotic before dental procedures.

You should also pay attention to the pain moderation and a wound surrounding – if it becomes irritated, your calf is swollen, pain has not subsided after painkillers – you should contact a doctor.

## **8. Driving a car / Working / Commuting**

You should wait until the hip is fully healed in order to drive. Usually, it takes up to 8 weeks, but your doctor should evaluate when are you ready.

Coming back to work depends on the work type that you are into, typically you can return in 8 weeks (office job), but it depends on the individual Patient features. You can freely use public transport; just make sure you have a stable position to avoid falling.

## **9. Activity**

Physical exercise is a critical part of your home convalescence and care. In an early period after surgery, you need to focus on rehabilitation. After 3 up to 6 weeks after the surgery, you should be able to get back to normal daily activities. You should start with an experienced therapist who will teach you how to walk slowly and later increase your mobility, how to sit with the hip prosthesis and how to bathe, stand up from your bed and use a toilet. As the exercising is really important, we recommend using a rehabilitation centre facility in order to recover under supervision and with help.

## **10. Physical therapy**

The most important part of your recovery. Most patients begin standing on the surgery day or a day after. The physical therapist will teach you how to walk and exercise to strengthen your hip.