

## Total Hip Replacement

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Whether you have just begun exploring treatment options or have already decided to undergo hip replacement surgery, this information will help you understand the benefits and limitations of total hip replacement. This article describes how a normal hip works, the causes of hip pain, what to expect from hip replacement surgery, and what exercises and activities will help restore your mobility and strength, and enable you to return to everyday activities.

If your hip has been damaged by arthritis, a fracture, or other conditions, common activities such as walking or getting in and out of a chair may be painful and difficult. Your hip may be stiff, and it may be hard to put on your shoes and socks. You may even feel uncomfortable while resting.

If medications, changes in your everyday activities, and the use of walking supports do not adequately help your symptoms, you may consider hip replacement surgery. Hip replacement surgery is a safe and effective procedure that can relieve your pain, increase motion, and help you get back to enjoying normal, everyday activities.

First performed in 1960, hip replacement surgery is one of the most successful operations in all of medicine. Since 1960, improvements in joint replacement surgical techniques and technology have greatly increased the effectiveness of total hip replacement. According to the Agency for Healthcare Research and Quality, more than 300,000 total hip replacements are performed each year in the United States.

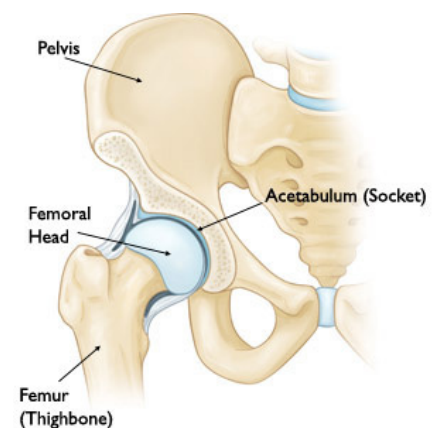
### Anatomy

The hip is one of the body's largest joints. It is a ball-and-socket joint. The socket is formed by the acetabulum, which is part of the large pelvis bone. The ball is the femoral head, which is the upper end of the femur (thighbone).

The bone surfaces of the ball and socket are covered with articular cartilage, a smooth tissue that cushions the ends of the bones and enables them to move easily.

A thin tissue called synovial membrane surrounds the hip joint. In a healthy hip, this membrane makes a small amount of fluid that lubricates the cartilage and eliminates almost all friction during hip movement.

Bands of tissue called ligaments (the hip capsule) connect the ball to the socket and provide stability to the joint.



Normal hip anatomy.

## Common Causes of Hip Pain

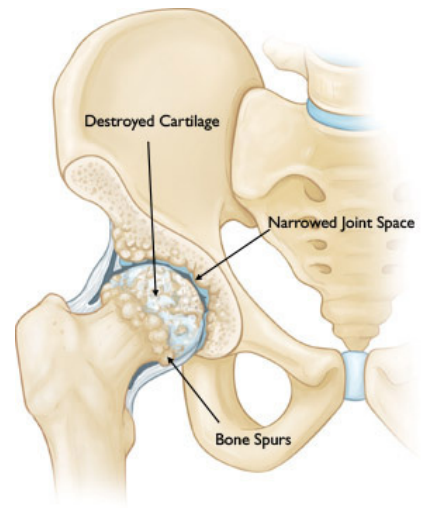
The most common cause of chronic hip pain and disability is arthritis. Osteoarthritis, rheumatoid arthritis, and traumatic arthritis are the most common forms of this disease.

- **Osteoarthritis.** This is an age-related “wear and tear” type of arthritis. It usually occurs in people 50 years of age and older and often in individuals with a family history of arthritis. The cartilage cushioning the bones of the hip wears away. The bones then rub against each other, causing hip pain and stiffness. Osteoarthritis may also be caused or accelerated by subtle irregularities in how the hip developed in childhood.
- **Rheumatoid arthritis.** This is an autoimmune disease in which the synovial membrane becomes inflamed and thickened. This chronic inflammation can damage the cartilage, leading to pain and stiffness. Rheumatoid arthritis is the most common type of a group of disorders termed “inflammatory arthritis.”
- **Post-traumatic arthritis.** This can follow a serious hip injury or fracture. The cartilage may become damaged and lead to hip pain and stiffness over time.
- **Avascular necrosis.** An injury to the hip, such as a dislocation or fracture, may limit the blood supply to the femoral head. This is called avascular necrosis (also commonly referred to as “osteonecrosis”). The lack of blood may cause the surface of the bone to collapse, and arthritis will result. Some diseases can also cause avascular necrosis.
- **Childhood hip disease.** Some infants and children have hip problems. Even though the problems are successfully treated during childhood, they may still cause arthritis later on in life. This happens because the hip may not grow normally, and the joint surfaces are affected.

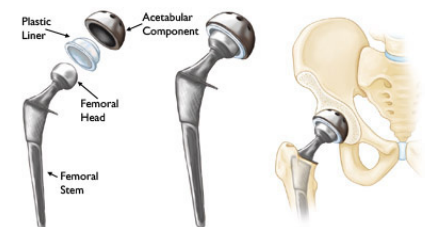
## Description

In a total hip replacement (also called total hip arthroplasty), the damaged bone and cartilage is removed and replaced with prosthetic components.

- The damaged femoral head is removed and replaced with a metal stem that is placed into the hollow center of the femur. The femoral stem may be either cemented or “press fit” into the bone.
- A metal or ceramic ball is placed on the upper part of the stem. This ball replaces the damaged femoral head that was removed.
- The damaged cartilage surface of the socket (acetabulum) is removed and replaced with a metal socket. Screws or cement are sometimes used to hold the socket in place.



A hip with osteoarthritis.



(Left) The individual components of a total hip replacement. (Center) The components merged into an implant. (Right) The implant as it fits into the hip.

- A plastic, ceramic, or metal spacer is inserted between the new ball and the socket to allow for a smooth gliding surface. However both arms can be affected.

## Is Hip Replacement Surgery for You?

The decision to have hip replacement surgery should be a cooperative one made by you, your family, your primary care doctor, and your orthopaedic surgeon. The process of making this decision typically begins with a referral by your doctor to an orthopaedic surgeon for an initial evaluation.

### Candidates for Surgery

There are no absolute age or weight restrictions for total hip replacements.

Recommendations for surgery are based on a patient's pain and disability, not age. Most patients who undergo total hip replacement are age 50 to 80, but orthopaedic surgeons evaluate patients individually. Total hip replacements have been performed successfully at all ages, from the young teenager with juvenile arthritis to the elderly patient with degenerative arthritis.

### When Surgery Is Recommended

There are several reasons why your doctor may recommend hip replacement surgery. People who benefit from hip replacement surgery often have:

- Hip pain that limits everyday activities, such as walking or bending
- Hip pain that continues while resting, either day or night
- Stiffness in a hip that limits the ability to move or lift the leg
- Inadequate pain relief from anti-inflammatory drugs, physical therapy, or walking supports

## The Orthopaedic Evaluation

An evaluation with an orthopaedic surgeon consists of several components.

- **Medical history.** Your orthopaedic surgeon will gather information about your general health and ask questions about the extent of your hip pain and how it affects your ability to perform everyday activities.
- **Physical examination.** This will assess hip mobility, strength, and alignment.
- **X-rays.** These images help to determine the extent of damage or deformity in your hip.
- **Other tests.** Occasionally other tests, such as a magnetic resonance imaging (MRI) scan, may be needed to determine the condition of the bone and soft tissues of your hip.

## Deciding to Have Hip Replacement Surgery

### Talk With Your Doctor

Your orthopaedic surgeon will review the results of your evaluation with you and discuss whether hip replacement surgery is the best method to relieve your pain and improve your mobility. Other treatment options – such as medications, physical therapy, or other types of surgery – also may be considered.

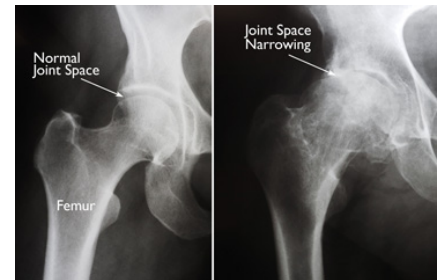
In addition, your orthopaedic surgeon will explain the potential risks and complications of hip replacement surgery, including those related to the surgery itself and those that can occur over time after your surgery.

Never hesitate to ask your doctor questions when you do not understand. The more you know, the better you will be able to manage the changes that hip replacement surgery will make in your life.

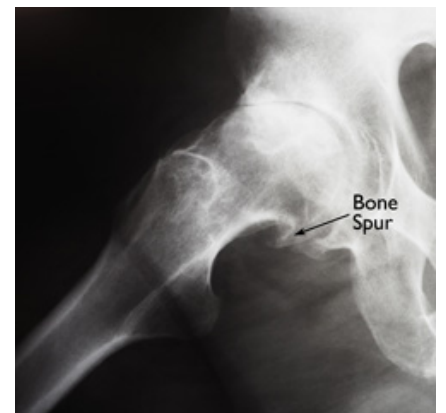
### Realistic Expectations

An important factor in deciding whether to have hip replacement surgery is understanding what the procedure can and cannot do. Most people who undergo hip replacement surgery experience a dramatic reduction of hip pain and a significant improvement in their ability to perform the common activities of daily living.

With normal use and activity, the material between the head and the socket of every hip replacement implant begins to wear. Excessive activity or being overweight may speed up this normal wear and cause the hip replacement to loosen and become painful. Therefore, most surgeons advise against high-impact activities such as running, jogging, jumping, or other high-impact sports.



(Left) In this x-ray of a normal hip, the space between the ball and socket indicates healthy cartilage. (Right) This x-ray of an arthritic hip shows severe loss of joint space.



This x-ray shows a large bone spur that has developed on the ball of an arthritic hip.

## Preparing for Surgery

### Medical Evaluation

If you decide to have hip replacement surgery, your orthopaedic surgeon may ask you to have a complete physical examination by your primary care doctor before your surgical procedure. This is needed to make sure you are healthy enough to have the surgery and complete the recovery process. Many patients with chronic medical conditions, like heart disease, may also be evaluated by a specialist, such a cardiologist, before the surgery.

### Tests

Several tests, such as blood and urine samples, an electrocardiogram (EKG), and chest x-rays, may be needed to help plan your surgery.

### Preparing Your Skin

Your skin should not have any infections or irritations before surgery. If either is present, contact your orthopaedic surgeon for treatment to improve your skin before surgery.

### Blood Donations

You may be advised to donate your own blood prior to surgery. It will be stored in the event you need blood after surgery.

### Medications

Tell your orthopaedic surgeon about the medications you are taking. He or she or your primary care doctor will advise you which medications you should stop taking and which you can continue to take before surgery.

### Weight Loss

If you are overweight, your doctor may ask you to lose some weight before surgery to minimize the stress on your new hip and possibly decrease the risks of surgery.

### Dental Evaluation

Although infections after hip replacement are not common, an infection can occur if bacteria enter your bloodstream. Because bacteria can enter the bloodstream during dental procedures, major dental procedures (such as tooth extractions and periodontal work) should be completed before your hip replacement surgery. Routine cleaning of your teeth should be delayed for several weeks after surgery.

### Urinary Evaluation

Individuals with a history of recent or frequent urinary infections should have a urological evaluation before surgery. Older men with prostate disease should consider completing required treatment before having surgery.

### Social Planning

Although you will be able to walk with crutches or a walker soon after surgery, you will need some help for several weeks with such tasks as cooking, shopping, bathing, and laundry.

If you live alone, your orthopaedic surgeon's office, a social worker, or a discharge planner at the hospital can help you make advance arrangements to have someone assist you at your home. A short stay in an extended care facility during your recovery after surgery also may be arranged.

### Home Planning

Several modifications can make your home easier to navigate during your recovery. The following items may help with daily activities:

- Securely fastened safety bars or handrails in your shower or bath
- Secure handrails along all stairways
- A stable chair for your early recovery with a firm seat cushion (that allows your knees to remain lower than your hips), a firm back, and two arms
- A raised toilet seat
- A stable shower bench or chair for bathing
- A long-handled sponge and shower hose
- A dressing stick, a sock aid, and a long-handled shoe horn for putting on and taking off shoes and socks without excessively bending your new hip
- A reacher that will allow you to grab objects without excessive bending of your hips
- Firm pillows for your chairs, sofas, and car that enable you to sit with your knees lower than your hips
- Removal of all loose carpets and electrical cords from the areas where you walk in your home

### Your Surgery

You will most likely be admitted to the hospital on the day of your surgery.

### Anesthesia

After admission, you will be evaluated by a member of the anesthesia team. The most common types of anesthesia are general anesthesia (you are put to sleep) or spinal, epidural, or regional nerve block anesthesia (you are awake but your body is numb from the waist down). The anesthesia team, with your input, will determine which type of anesthesia will be best for you.



Set up a "recovery center" where you will spend most of your time. Things like the phone, television remote control, reading materials, and medications should all be within reach.



### Implant Components

Many different types of designs and materials are currently used in artificial hip joints. All of them consist of two basic components: the ball component (made of highly polished strong metal or ceramic material) and the socket component (a durable cup of plastic, ceramic or metal, which may have an outer metal shell).

The prosthetic components may be “press fit” into the bone to allow your bone to grow onto the components or they may be cemented into place. The decision to press fit or to cement the components is based on a number of factors, such as the quality and strength of your bone. A combination of a cemented stem and a non-cemented socket may also be used.

Your orthopaedic surgeon will choose the type of prosthesis that best meets your needs.

### Procedure

The surgical procedure takes a few hours. Your orthopaedic surgeon will remove the damaged cartilage and bone and then position new metal, plastic, or ceramic implants to restore the alignment and function of your hip.

After surgery, you will be moved to the recovery room where you will remain for several hours while your recovery from anesthesia is monitored. After you wake up, you will be taken to your hospital room.

### Your Stay in the Hospital

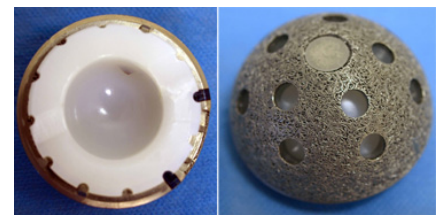
You will most likely stay in the hospital for a few days. To protect your hip during early recovery, a positioning splint, such as a foam pillow placed between your legs, may be used.

### Pain Management

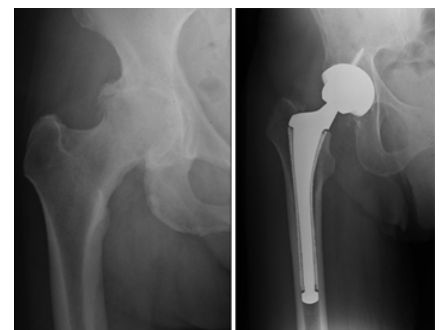
After surgery, you will feel some pain, but your surgeon and nurses will provide medication to make you feel as comfortable as possible. Pain management is an important part of your recovery. Movement will begin soon after surgery, and when you feel less pain, you can start moving sooner and get your strength back more quickly. Talk with your surgeon if postoperative pain becomes a problem.



**(Left)** A standard non-cemented femoral component. **(Center)** A close-up of this component showing the porous surface for bone ingrowth. **(Right)** The femoral component and the acetabular component working together.



**(Left)** The acetabular component shows the plastic (polyethylene) liner inside the metal shell. **(Right)** The porous surface of this acetabular component allows for bone ingrowth. The holes around the cup are used if screws are needed to hold the cup in place.



X-rays before and after total hip replacement. In this case, non-cemented components were used.

### Physical Therapy

Walking and light activity are important to your recovery. Most patients who undergo total hip replacement begin standing and walking with the help of a walking support and a physical therapist the day after surgery. In some cases, patients begin standing and walking on the actual day of surgery. The physical therapist will teach you specific exercises to strengthen your hip and restore movement for walking and other normal daily activities.

### Preventing Pneumonia

It is common for patients to have shallow breathing in the early postoperative period. This is usually due to the effects of anesthesia, pain medications, and increased time spent in bed. This shallow breathing can lead to a partial collapse of the lungs (termed "atelectasis") which can make patients susceptible to pneumonia. To help prevent this, it is important to take frequent deep breaths. Your nurse may provide a simple breathing apparatus called a spirometer to encourage you to take deep breaths.

### Recovery

The success of your surgery will depend in large measure on how well you follow your orthopaedic surgeon's instructions regarding home care during the first few weeks after surgery.

### Wound Care

You may have stitches or staples running along your wound or a suture beneath your skin. The stitches or staples will be removed approximately 2 weeks after surgery.

Avoid getting the wound wet until it has thoroughly sealed and dried. You may continue to bandage the wound to prevent irritation from clothing or support stockings.

### Diet

Some loss of appetite is common for several weeks after surgery. A balanced diet, often with an iron supplement, is important to promote proper tissue healing and restore muscle strength. Be sure to drink plenty of fluids.

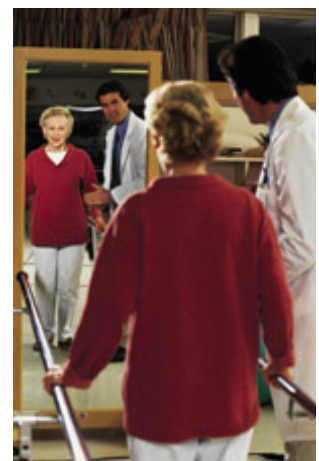
### Activity

Exercise is a critical component of home care, particularly during the first few weeks after surgery. You should be able to resume most normal light activities of daily living within 3 to 6 weeks following surgery. Some discomfort with activity and at night is common for several weeks.



A spirometer measures the amount of air you breathe in and out.

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Your activity program should include:

- A graduated walking program to slowly increase your mobility, initially in your home and later outside
- Resuming other normal household activities, such as sitting, standing, and climbing stairs
- Specific exercises several times a day to restore movement and strengthen your hip. You probably will be able to perform the exercises without help, but you may have a physical therapist help you at home or in a therapy center the first few weeks after surgery

## Possible Complications of Surgery

The complication rate following hip replacement surgery is low. Serious complications, such as joint infection, occur in less than 2% of patients. Major medical complications, such as heart attack or stroke, occur even less frequently. However, chronic illnesses may increase the potential for complications. Although uncommon, when these complications occur they can prolong or limit full recovery.

### Infection

Infection may occur superficially in the wound or deep around the prosthesis. It may happen while in the hospital or after you go home. It may even occur years later.

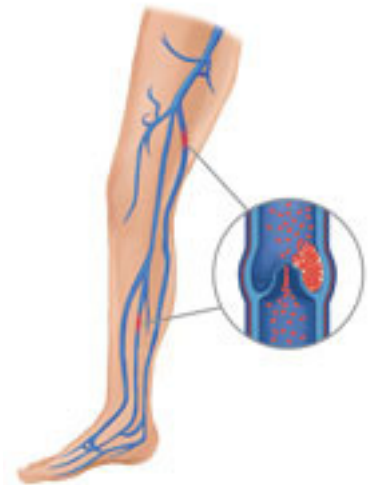
Minor infections of the wound are generally treated with antibiotics. Major or deep infections may require more surgery and removal of the prosthesis. Any infection in your body can spread to your joint replacement.

### Blood Clots

Blood clots in the leg veins or pelvis are one of the most common complications of hip replacement surgery. These clots can be life-threatening if they break free and travel to your lungs. Your orthopaedic surgeon will outline a prevention program which may include blood thinning medications, support hose, inflatable leg coverings, ankle pump exercises, and early mobilization.

### Leg-length Inequality

Sometimes after a hip replacement, one leg may feel longer or shorter than the other. Your orthopaedic surgeon will make every effort to make your leg lengths even, but may lengthen or shorten your leg slightly in order to maximize the stability and biomechanics of the hip. Some patients may feel more comfortable with a shoe lift after surgery.



Blood clots may form in the leg veins or pelvis.

### Dislocation

This occurs when the ball comes out of the socket. The risk for dislocation is greatest in the first few months after surgery while the tissues are healing. Dislocation is uncommon. If the ball does come out of the socket, a closed reduction usually can put it back into place without the need for more surgery. In situations in which the hip continues to dislocate, further surgery may be necessary.

### Loosening and Implant Wear

Over years, the hip prosthesis may wear out or loosen. This is most often due to everyday activity. It can also result from a biologic thinning of the bone called osteolysis. If loosening is painful, a second surgery called a revision may be necessary.

### Other Complications

Nerve and blood vessel injury, bleeding, fracture, and stiffness can occur. In a small number of patients, some pain can continue or new pain can occur after surgery.

## Avoiding Problems After Surgery

### Recognizing the Signs of a Blood Clot

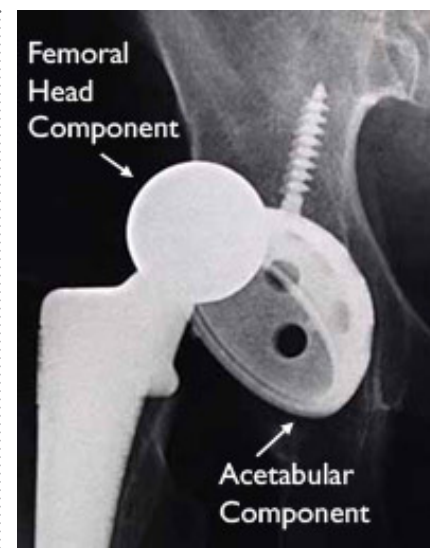
Follow your orthopaedic surgeon's instructions carefully to reduce the risk of blood clots developing during the first several weeks of your recovery. He or she may recommend that you continue taking the blood thinning medication you started in the hospital. Notify your doctor immediately if you develop any of the following warning signs.

**Warning signs of blood clots.** The warning signs of possible blood clot in your leg include:

- Pain in your calf and leg that is unrelated to your incision
- Tenderness or redness of your calf
- New or increasing swelling of your thigh, calf, ankle, or foot

**Warning signs of pulmonary embolism.** The warning signs that a blood clot has traveled to your lung include:

- Sudden shortness of breath
- Sudden onset of chest pain
- Localized chest pain with coughing



Hip implant dislocation.

### Preventing Infection

A common cause of infection following hip replacement surgery is from bacteria that enter the bloodstream during dental procedures, urinary tract infections, or skin infections.

Following surgery, patients with certain risk factors may need to take antibiotics prior to dental work, including dental cleanings, or before any surgical procedure that could allow bacteria to enter your bloodstream. Your orthopaedic surgeon will discuss with you whether taking preventive antibiotics before dental procedures is needed in your situation.

**Warning signs of infection.** Notify your doctor immediately if you develop any of the following signs of a possible hip replacement infection:

- Persistent fever (higher than 100°F orally)
- Shaking chills
- Increasing redness, tenderness, or swelling of the hip wound
- Drainage from the hip wound
- Increasing hip pain with both activity and rest

### Avoiding Falls

A fall during the first few weeks after surgery can damage your new hip and may result in a need for more surgery. Stairs are a particular hazard until your hip is strong and mobile. You should use a cane, crutches, a walker, or handrails or have someone help you until you improve your balance, flexibility, and strength.

Your orthopaedic surgeon and physical therapist will help you decide which assistive aides will be required following surgery, and when those aides can safely be discontinued.

### Other Precautions

To assure proper recovery and prevent dislocation of the prosthesis, you may be asked to take special precautions when sitting, bending, or sleeping – usually for the first 6 weeks after surgery. These precautions will vary from patient to patient, depending on the surgical approach your surgeon used to perform your hip replacement.

Prior to discharge from the hospital, your surgeon and physical therapist will provide you with any specific precautions you should follow.

## Outcomes

### How Your New Hip Is Different

You may feel some numbness in the skin around your incision. You also may feel some stiffness, particularly with excessive bending. These differences often diminish with time, and most patients find these are minor compared with the pain and limited function they experienced prior to surgery.

Your new hip may activate metal detectors required for security in airports and some buildings. Tell the security agent about your hip replacement if the alarm is activated. You may ask your orthopaedic surgeon for a card confirming that you have an artificial hip.

### Protecting Your Hip Replacement

There are many things you can do to protect your hip replacement and extend the life of your hip implant.

- Participate in a regular light exercise program to maintain proper strength and mobility of your new hip.
- Take special precautions to avoid falls and injuries. If you break a bone in your leg, you may require more surgery.
- Make sure your dentist knows that you have a hip replacement. Talk with your orthopaedic surgeon about whether you need to take antibiotics prior to dental procedures.
- See your orthopaedic surgeon periodically for routine follow-up examinations and x-rays, even if your hip replacement seems to be doing fine.

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