# Informed Patient Tutorial

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## Informed Patient - Total Hip Replacement

### Introduction

Welcome to the American Academy of Orthopaedic Surgeons' Informed Patient Program. These online learning modules have been developed by orthopaedic surgeons to help you better understand your condition and the treatments your doctor recommends.

The buttons at the bottom of this screen will help you navigate through the learning module. You may choose to turn the audio off or back on at any time during the module.

We also offer a printer-friendly version of this module. Simply click the "Print" button in the bottom left corner to create a paper copy.

Click the ***"Next"*** button to begin your learning module.

Total hip replacement is the most common surgical procedure used to treat a painful hip. According to the Agency for Healthcare Research and Quality (AHRQ), approximately 238,000 total hip replacements were performed in the United States in 2004.

This tutorial will explain why your hip may hurt and what treatment may be used to relieve the pain. It will show you some of the causes of a painful hip. It will tell you some of the ways to treat your hip without surgery. It will then explain why you may need a total hip replacement and what you can expect from surgery.

There are ten parts to the tutorial. As you work through them, you

will be asked whether you understand the information, and you will be reminded to write down any questions you still have in order to remember to ask about them when you next talk with your orthopaedic surgeon.

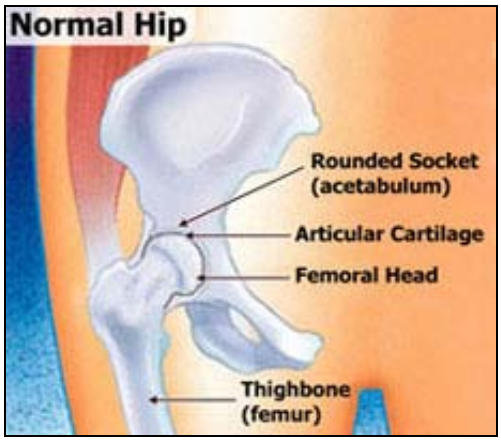
The tutorial includes the following sections:

1. *Your Hip:* The anatomy of the hip is explained.
2. *Causes:* Many conditions cause a painful hip. This section describes some of the conditions that may lead to hip pain.
3. *Symptoms:* This section explains some of the signs to look for in a painful, osteoarthritic hip.
4. *Diagnosis:* This section explains some of the ways hip arthritis is diagnosed.
5. *Nonsurgical Treatment:* There are many nonsurgical options physicians have to treat osteoarthritis. Some of these are explained in this section.
6. *Surgical Treatment:* This section describes some of the aspects of surgical treatment.
7. *Your Surgery:* This section reviews what you may expect during surgery.
8. *After Surgery:* This section explains what you may expect after surgery.
9. *Risks and Complications:* Some risks and complications can be expected with any surgery. This section outlines a few.
10. *Conclusion:* This section sums up the information and provides you with an opportunity to add more questions for your doctor.

## Your Hip

### Anatomy

The hip is one of the largest weight-bearing joints in your body. It is shaped like a ball and socket. The ball is the top of the thigh bone, which is called the *femoral head*. The socket, which is cup-shaped, is called the *acetabulum*. It sits in the pelvis.



Both sides of the joint are covered by a smooth white substance called *cartilage*. Joint fluid lubricates the joint. The hip is held in place by a group of *ligaments* called the *capsule*.

When the cartilage wears down, the ball can no longer move smoothly against the socket. The hip joint may become stiff and painful. This is arthritis.

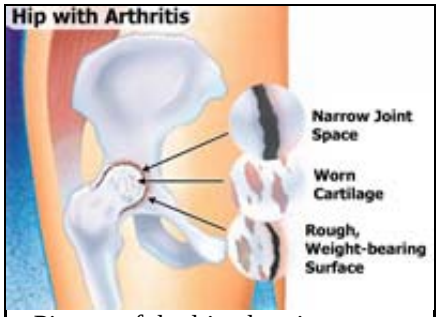
## Causes of Hip Pain

Many diseases can cause a painful hip. Some of these include:

1. Osteoarthritis
2. Rheumatoid arthritis
3. Posttraumatic arthritis
4. Avascular necrosis
5. Childhood hip disease

### Osteoarthritis

Osteoarthritis is the most common reason why people need a total hip replacement. Osteoarthritis is a result of wear and tear. It is common in older patients. Most often it occurs in one joint at a time. When osteoarthritis develops, the joint surfaces break down. The joint space between the bones narrows and spurs may form. The surfaces become hard, or sclerotic. The hip can no longer move as easily as it once did.



Picture of the hip showing changes that can occur with arthritis.

This is an X ray of a hip without disease. The bone is smooth and there is space (arrows) between the top of the thighbone (femur) and the cup of the hip bone (acetabulum).

Narrowing of the joint space, hard whitish (sclerotic) bone

and formation of bone spurs.

## Rheumatoid Arthritis

Unlike osteoarthritis, RA affects many joints throughout the body at the same time. Multiple joints become swollen, painful, and stiff. The bone becomes soft and the joint surfaces are destroyed.

Rheumatoid arthritis of the hand
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## Posttraumatic Arthritis

If a bone breaks (fractures) within or near a joint, the joint surface may be damaged. This may lead to arthritis in that joint years after the injury.

Healed fracture of femoral

neck with pins in place.

Same case as to the left. The pins have been removed and the hip has developed post-traumatic arthritis.

## Avascular Necrosis

An injury to the hip such as a joint dislocation or femoral neck fracture, may limit the blood flow to the femoral head. Some diseases may also cause this to happen.

The lack of blood may cause the joint surface of the femoral head to collapse, and arthritis will result.

A wedge shaped area of avascular necrosis in the femoral head shown between the arrows.

Same case as left. Closeup showing collapse of the joint surface of the femoral head.

## 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. Examples of childhood hip disease include developmental dysplasia of the hip, Perthes disease, and slipped

epiphysis.

Arthritis due to childhood hip disease. The femoral head is unusually wide and flat due to Perthes disease.

## Symptoms

The onset of symptoms in your hip may be gradual. The pain may come and go. It may occur only when you walk long distances, bend over, or climb stairs. As the disease gets worse, you may notice pain when you are sitting, lying down, or even sleeping. The pain may last for longer periods of time and may never go away.

Typically, you will first feel the pain in your groin or on the side or back of your hip. It may extend to the front of your thigh and down to your knee. Your hip may feel stiff or tight.

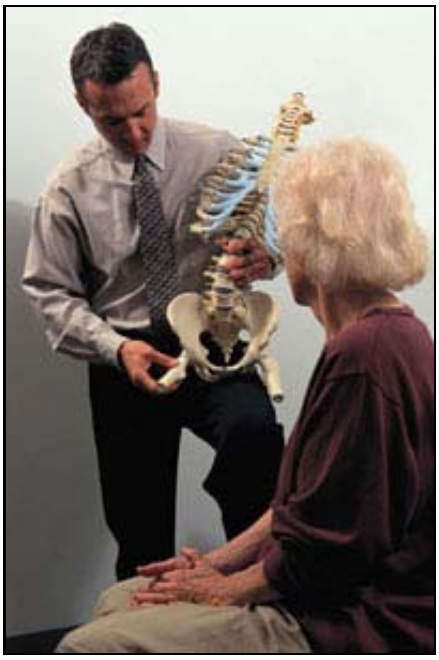
You may find it hard to do things like cutting your toe nails, putting on socks or getting dressed. It may be hard to get up from a chair or to get in and out of a car. You may need to climb stairs one at a time. You may have difficulty taking your first few steps when you start to walk. You may limp or have to stop and rest after you have been walking for a few minutes. As time goes on you may feel that you are unable to straighten your leg or that your "bad" leg feels shorter than your "normal" one.

Your orthopaedic surgeon can diagnose and help you treat your painful hip.

## Diagnosis

If your hip is stiff or painful or you are having trouble walking, a visit to your orthopaedic surgeon can help find the cause of your symptoms.

Your surgeon will ask you to describe your symptoms. He may ask questions about the location of your pain, when your symptoms started, and when the pain occurs. He will ask about your medical history.



Your surgeon will then examine your hip and any other areas that might be causing your pain. He may order several tests, including an X ray.

The diagnosis of hip arthritis is based on your medical history, physical examination, and X ray findings.

## Nonsurgical Treatment

There are many ways to treat an arthritic hip without surgery. These include:

- Activity changes
- Medications
- Weight loss and exercise
- Walking aids

### Activity Changes

First, you should limit or change the activities that make your hip hurt. You may want to stop and rest if you are walking long distances. You may want to avoid bending and lifting. You can limit exercises that have a heavy impact on your hip or shorten your time in sports activities, such as hiking or tennis.

## Medications

Non-steroidal anti-inflammatory medications, or NSAIDs, may help to control your symptoms. Some examples of NSAIDs are aspirin, ibuprofen, and naproxen. These may be taken on a regular basis or only when you have pain. They can, however, have side effects, such as nausea, stomach upset, or bleeding. It is important to see your doctor on a regular basis if you are taking any of these drugs.

Other non-prescription drugs, like glucosamine and chondroitin, may also help to control your symptoms.

## Weight Loss and Exercise

If you are heavy, weight loss may reduce the stress on your hip and relieve some of the pain.

A program of regular exercise or physical therapy can help to preserve the motion in your hip. This can prevent stiffness and allow you to do more.

## Walking Aides

An external walking aid such as a cane can provide support and balance. You should hold a cane in the hand opposite the side of your bad hip.

Nonsurgical treatment can improve the symptoms in your hips. While arthritis is painful and affects the quality of your life, it is not life threatening. The decision for surgery is individual and is based on your symptoms. There is no medical risk to not having surgery.

## Surgical Treatment

Total hip replacement is the most common surgical procedure used to treat an arthritic hip. Other procedures such as partial or bipolar replacement, hip fusion, and surface replacement, are less common.

## Components

The two components of a total hip are a metal ball which replaces the head of the femur and a metal socket with a plastic lining that replaces the normal socket, the acetabulum. The ball is attached to a metal stem that fits inside the normal femur.

Standard non-cemented femoral component

Femoral and acetabular components - articulating ball and socket

## Materials

The metal is typically stainless steel or a metal alloy of cobalt, chrome or titanium. The plastic is a durable material called polyethylene.

In some cases, other materials such as ceramics may be used, or the joint may be a metal ball and an all-metal socket.

Plastic (polyethylene) liner of acetabulum inside metal shell

Frequently, the metal surfaces of the stem or the acetabulum have a porous coating that allows bone to grow into the metal and hold the component in place.

All of the components come in multiple sizes. Each side of the joint is prepared to accept the right size component.

Porous surface of acetabular component allows for bone ingrowth.

Closeup of femoral component showing porous surface for bone ingrowth (arrows).

The components may be pressed directly into bone (press fit), or they may be held in place with special cement called methyl methacrylate. Sometimes a cemented stem is used with a non-cemented socket (hybrid replacement).

Total hip

with non-cemented femoral and acetabular components

Non-cemented acetabular and cemented femoral components. Arrows point to cement in the femoral canal.

## Your Surgery

### Before Surgery

Your orthopaedic surgeon will help you plan and prepare for your surgical procedure. You may have to obtain tests such as blood tests, cardiogram or chest X ray

You should tell your surgeon about any medical history and any medications you are taking. Your orthopaedic surgeon may ask that you see your primary doctor to make sure that you have no medical problems that need to be treated before your surgery.

Any dental problems or urinary or sinus infections must be treated before surgery.

You may be asked to donate your own blood in case you need blood transfusion after the procedure.

### The Day of Surgery

Most patients are admitted to the hospital on the day of surgery. Before surgery, you will be evaluated by an anesthesiologist. She will review your medical history and discuss anesthesia choices with you. Anesthesia can be either general (you are put to sleep) or spinal (you are awake but your body is numb from the waist down).

### The Procedure

There are several different surgical approaches for total hip replacement. Your surgeon may make an incision on the front, back, or side of your hip. Newer, minimally invasive, techniques allow for the procedure to be done through one or two smaller incisions.

The long-term results of minimally invasive and other newer procedures are not yet known. Your orthopaedic surgeon can discuss the risks and benefits as well as his or her experience with this type of surgery.

## After Surgery

After surgery you will be admitted to the hospital. You will be monitored during the post-operative period and given pain medicine. You will be given antibiotics to protect your hip from infection. Blood thinners and other measures such as support stockings help prevent clots from forming in your legs.

### Physical Therapy

Physical therapy will be started on the day of surgery or one to two days after. A therapist will teach you how to use a walker or crutches and give you exercises to strengthen your hip. You may be given assistive devices to help you put on your shoes or pick up objects from the floor. After a short stay in the hospital you will either go home or to a rehabilitation center.

Once you are home you will have outpatient physical therapy. It is important to make a strong effort at exercise and rehabilitation in order to achieve a good result. Complete rehabilitation may take two to four months.

## Risks and Complications

The complication rate for total hip surgery is low. Most problems are minor and can be easily treated. Major complications occur in less than 2% of cases. It is important that you know and understand the risks before you make a decision to have surgery. Possible surgical complications include:

1. Infection
2. Blood Clots
3. Loosening
4. Dislocation
5. Leg Length Inequality

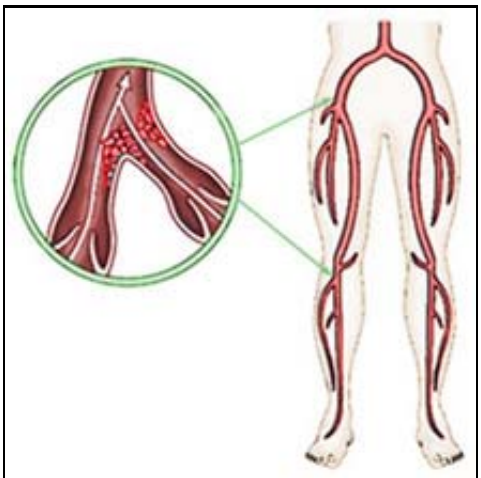
## Infection

You will be given antibiotics before the start of your surgery and these will be continued for about 24 hours afterward. This is done to help prevent infection. A superficial infection may involve only the skin and soft tissues. A deeper infection may enter the hip joint and bone.

Infections can occur right after surgery or years later if bacteria enter the bloodstream from another part of the body. For this reason it is recommended that you take antibiotics before you have dental work (http://orthoinfo.aaos.org/topic.cfm?topic=A00226) or cleaning. You should also take antibiotics if you have an open wound, are having surgery, or have an infection in any other part of your body.

Many infections can be treated with antibiotics. A deep infection may require a procedure to remove all of the hip replacement components. This would be followed by antibiotic treatment, and then a second surgery to implant a new ball and socket.

## Blood Clots



Clot formation

Blood clots can form in the deep veins of the legs or pelvis after surgery. Blood thinners such as warfarin (Coumadin), low-molecular-weight heparin, aspirin, or other drugs can help to prevent this problem. Other measures, such as compression stockings, or pneumatic boots are also used.

Clots are most likely to form in the first four weeks after surgery.

Signs of a clot include unexplained pain, swelling, and redness in one or both legs. If your surgeon suspects a clot he or she will order a special test called an ultrasound. If the test is positive you may need to stay on blood thinners for several weeks.

Rarely, a clot may break off from the legs and go to another area such as the lungs.

## Loosening

Most total hip replacements will last for many years. Over time, however, one or both components can separate from bone. This is called loosening. It is most often due to everyday wear and activity. It can also result from a biologic thinning of the bone called *osteolysis*.

If loosening is painful, a second surgical procedure called "revision" may be necessary.

Newer techniques and materials are expected to reduce the incidence of loosening in the future.

Thinning of the bone (arrows) causing loosening of the femoral component

## Dislocation

Dislocation occurs when the ball comes out of the socket. The risk of dislocation is greatest in the first few months after surgery while the tissues are healing. Your therapist will tell you how to protect your new hip. You should avoid positions that can cause dislocation such as crossing your legs or bending too far.

The overall incidence of dislocation is low. If the ball does come out of the socket, a procedure called a "reduction" can put it back in place.

The ball has come out of the socket.

## Leg Length Inequality

In some circumstances after hip replacement, one of your legs may feel longer than the other. If your leg was shortened due to arthritis before surgery it may feel longer when it has been corrected. A curvature in your spine may also cause your legs to feel unequal.

Sometimes the need to balance muscle and soft tissue tension or the need to create stability can affect leg

lengths during surgery. Sometimes it may be necessary to lengthen your leg to prevent dislocation. Your surgeon will take all these factors into account during your procedure.

If your legs feel unequal, that is, one leg feels longer than the other, you may be more comfortable wearing a shoe lift on one side.

### Other Complications

Other, less common, orthopaedic complications include injury to nerves and vessels around the hip, and fracture (break) of the femur or the socket.

In a small number of patients, pain may continue after surgery, or new pain can develop.

Major medical complications such as pneumonia, heart problems, stroke, or death, are unusual but can occur following any type of major surgery.

## Conclusion

Total hip replacement is a highly successful procedure that can relieve pain in your hip and improve your mobility.

Understanding the goals of surgery, the benefits, and the risks is important when you are making the decision to have or not have surgery.

Your orthopaedic surgeon is a highly trained specialist who can answer your questions and provide more information about hip replacement surgery.