ALAN H. LEE, M.D.
ORTHOPAEDIC SURGERY AND SPORTS MEDICINE

Keck School of Medicine of USC

About Your Surgery: Understanding Joint Replacement Surgery

Alan H. Lee, M.D.
Board-certified Orthopaedic Surgeon
Fellowship-trained in Sports Medicine and Arthroscopy

How A Normal Joint Works

A joint is a place in the body where two or more bones come together. The various structures in and around the joint allow the bones to move and enable you to walk, reach, grasp, chew, and perform countless other activities. Normal joint function is needed to perform these everyday activities easily and without discomfort.

All healthy joints in the body, large and small, consist of bones covered by a smooth, pearl-white coating of cartilage - an elastic tissue that cushions the bones and allows pain-free motion. Moveable joints are lined with a thin, smooth lining called the synovium which produces a special fluid that lubricates the joint and reduces friction. Many structures are involved in smooth joint motion, including the muscles, nerves, tendons, and ligaments that surround the joint itself.

The bones in a joint can connect in several different ways, resulting in different types of joints. Your hip a ball and socket joint. It connects your upper leg to your pelvis. The upper end of the thigh bone (femur) ends in a ball, which fits into a special groove or socket (acetabulum) in the pelvic bone. Ligaments and muscles surrounding the joint provide motion and stability.

Your knee the hinge-like connection between the lower end of the thigh bone (femur) and the upper end of the shin bone (tibia). The kneecap (patella) slides within a groove on the end of the femur when the knee bends and straightens. Ligaments provide stability, and the long thigh muscles provide the knee with motion and strength.

Arthritis

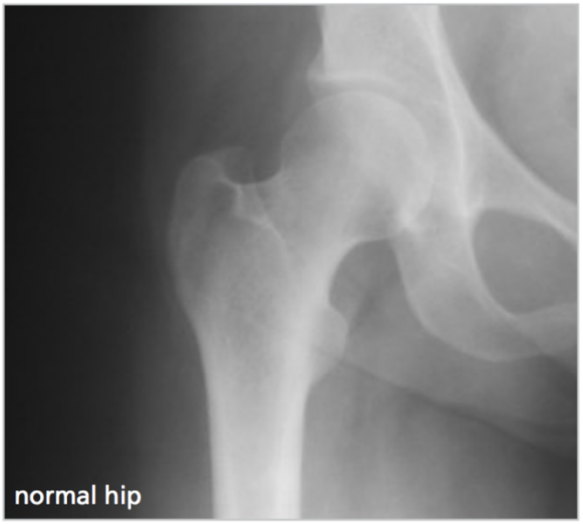
Under normal, healthy circumstances, all of the parts of a joint work smoothly together to allow painless motion. But a number of things can go wrong with the joint and cause pain, stiffness, weakness, and loss of motion. Arthritis is a term we use to describe a diseased and painful joint.

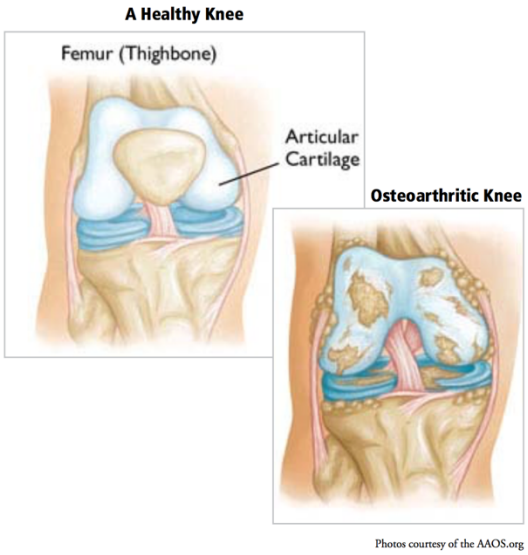
In the early stages, arthritis pain is caused by inflammation or swelling of the joint structures. In later stages, the cartilage covering the joint bones is worn away and the underlying bone

becomes exposed. The bones of the joint begin to rub together, causing friction and pain. There are several different types of arthritis.

Osteoarthritis (OA)

Osteoarthritis (OA), or degenerative joint disease, is by far the most common form of arthritis. It is the result of the stresses and strains on the joint that occur over many years. It occurs most often in the weight-bearing joints of the hip, knee, ankle, and foot. The joint cartilage on the ends of the bones becomes damaged, pitted, and worn away, which prevents smooth, friction-free movement inside the joint. With osteoarthritis, you may have a painful, grinding feeling as the joint moves and the bone surfaces rub against each other. Pain, stiffness, swelling, and difficulty walking are common as the cartilage continues to wear away. In some cases, family history plays a role in the development of OA.





normal knee

knee with osteoarthritis

Rheumatoid Arthritis (RA)

Rheumatoid arthritis (RA) is an inflammatory disease of the synovium - the tissue that lines the inside of the joints and produces a slippery fluid that keeps the joints lubricated. Unlike osteoarthritis, which is largely caused by stress and strain to the joint, rheumatoid arthritis is a disease that causes the joint's synovium to become inflamed and thickened. This breaks down the surrounding cartilage, ligaments, and even bone. The joints become swollen, painful, stiff, and deformed. Because RA is a "systemic" disease (a disease that affects the whole body), some patients with RA have other problems not related to the joints.

Traumatic Arthritis

Traumatic arthritis can develop in someone who has had a serious injury in or around a joint (ligament disruption, bone fracture, etc.) at some point in the past. Trauma to the joint can eventually cause imbalances and premature destruction of cartilage similar to what occurs in osteoarthritis.

Avascular Necrosis (AVN)

Avascular necrosis (AVN), or osteonecrosis, is a type of arthritis caused by a lack of blood supply to a joint. It may be related to an underlying medical condition, to drugs that have been needed to treat some other illness, or to lifestyle issues. This loss of blood supply causes the bone cells to die. The joint collapses into an irregular shape and the cartilage covering the bones breaks down.

Joint Replacement Surgery and Recovery

Joint replacement surgery is a procedure that can restore joint mobility and function in patients with significant joint disease. It can enable patients with arthritis to move with renewed ease, freedom of motion, and comfort. During the procedure, the surgeon makes a limited incision to expose the damaged joint. Only the diseased portions of the bone and joint are removed and replaced with artificial parts that have been custom-sized for your joint. The parts are made of titanium or cobalt chrome metal, polyethylene, and/or ceramic. These materials provide the joint with a new, smooth surface for weight bearing. Your surgeon will leave as much of your natural joint in place as possible; only the diseased and damaged bone and cartilage surfaces will be removed (so this is really "resurfacing"). The artificial joint may be a complete ("total") or a partial ("unicompartmental") replacement of your joint, depending upon your specific requirements.

Total hip replacements have been performed since the 1960's, and total knee replacements

followed a few years later. Other joints can be replaced as well. Today these surgeries are quite common and very successful when performed by surgeons who specialize in these complex procedures.

Photo courtesy of the AAOS.org

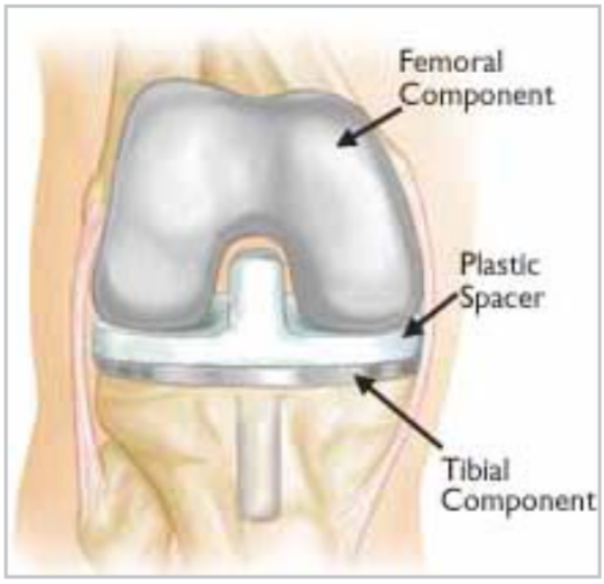


Photo courtesy of the AAOS.org

Risks and Complications

As with any operation, there are risks and complications associated with joint replacement surgery. However, these problems occur very infrequently. Here are some of the risks and complications that can occur. Please ask your surgeon for more detailed information that may apply to you.

Symptomatic blood clots in the legs (deep vein thrombosis) or the lungs (pulmonary embolus) - This can be a very serious problem but fortunately the occurrence is very low. Steps to prevent this complication are discussed in detail in other sections of this manual.
If blood clots do occur, treatment may include changes in your activity and longer duration of blood-thinning medications such as Lovenox or Coumadin.

Infection - We take many steps to prevent this uncommon complication, including giving you antibiotics by vein and operating in special sterile rooms and using sterile surgical suits. However, if an infection does develop, it can be serious and may require removal of the new artificial joint with insertion of a temporary antibiotic spacer in the leg, followed a couple of months later with implantation of a new artificial joint. Deep infections occur in approximately 1% of patients having joint replacement surgery.

Damage to the nerves, blood vessels, or bones during surgery - In rare cases, nerves or blood vessels can be damaged. Sometimes, nerve damage is related to scar tissue from previous surgery. Fractures of the femur or tibia bone occur in less than 1% of patients, and are more common in revision surgery (surgery on a previously replaced joint).

Need for bone grafting - Sometimes, bone "grafts" from a bone bank are needed during surgery. Ask your surgeon for more information about bone grafting if you are having a revision joint replacement surgery.

Other complications may include problems with the incision or stiffness in the joint. As with any operation, there is a risk of serious problems or even death, but this risk is very low.

Anesthesia Options

The most common types of anesthesia used for joint replacement surgery are described here. Typically we use some combination of anesthetics. An anesthesiologist meets with each patient before surgery to determine the types of anesthesia that are best.

General anesthesia is a complete, deep sleep state that involves the entire body. The medications are injected into an intravenous (IV) line and given as inhaled gas.

Regional anesthesia comes in many forms, and involves injecting a nerve-blocking medicine through a needle to keep certain parts of your body numb. Patients receiving regional anesthesia also receive sedatives through an IV. Here are some examples of regional anesthesia.

- **A femoral nerve block** is often performed for knee replacement surgery. It numbs the front portion of the leg.
- **A sciatic nerve block** numbs the back portion of the leg.
- **Epidural anesthesia or a spinal anesthesia** makes the body numb from the waist down. Patients receiving this type of anesthesia are not be able to move their legs until the medicine wears off or is discontinued. The medicine is introduced into the low back through a needle.
- **Local anesthesia** is numbing medicine given by your surgeon directly into the area of the surgery at the time of the procedure.

Recovery from Surgery

Most hip and knee replacement surgeries are very successful in relieving pain and improving motion, but the recuperation can be uncomfortable and requires considerable time and effort by the patient. For most patients, discomfort is controlled with medication. Recovery includes physical therapy, medications to relieve pain, incision care, and more. A comfortable return to daily living activities depends on your health and conditioning before the procedure, your age, your weight, your motivation for rehabilitation, and the type of joint replacement that you require. Typically, patients may need three to six months to achieve a full return of strength, energy, motion, and comfort.

Is Joint Replacement Surgery Right for You?

There are a number of factors to consider in deciding if joint replacement surgery is right for you. You should discuss these factors with your family, your primary care doctor, and your orthopaedic surgeon. This guidebook and other resources will give you valuable information, but it is unlikely that any single resource will answer all of your questions. Write down your questions for your surgeon so you don't forget them. By working as a team with your providers, you will be better able to make the decision that is right for you.

Timing is an important consideration. Joint replacement is an elective procedure - you will never need a knee or hip replacement if you are willing to continue to live with the pain. We strongly encourage you to remain active just as long as you can on your own natural joints before having a joint replaced for the first time. While quite durable, artificial joints, along with your bone that supports them, do wear out and may fail over time.

On the other hand, unless you are now quite young for a joint replacement, waiting for years in the hope of some major advancement in surgical technique or changes in artificial joint design or durability may prove disappointing to you in the long run. Improvements in artificial joint technologies and surgical techniques occur steadily, but slowly. If your disability has not responded satisfactorily to your best conservative efforts, and you want to regain a life now that includes significantly less pain, then this may be a reasonable time to move forward with joint replacement surgery.

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Factors You Should Consider

There are a number of factors you should consider when deciding about joint replacement. Some of these are:

- Is the time right for me?
- What benefits can I expect from the surgery?
- What will I need to do to protect a new joint?
- How long will the new joint last?
- What are the risks of surgery?

Reason You May Elect Surgery

You may elect to have joint replacement surgery for these reasons:

- **Severe pain** that limits your everyday activities including walking, climbing stairs, and getting out of chairs
- **Difficulty walking** more than a few blocks without significant pain, and/or the need to use a cane, walker, or leg brace
- **Significant pain** while resting or sleeping, either day or night
- **Deformity -** a bowing of your knees or progressive shortening of the leg
- **Joint stiffness -** inability to bend or straighten your hip or knee
- **Limitations of medication -** failure to obtain relief from swelling and pain with rest and/or a variety of non-steroidal anti-inflammatory drugs (NSAIDs). These medications often are more effective in the earlier stages of arthritis, but they cannot influence the outcome of arthritis. The NSAIDs all have potentially serious side effects from prolonged usage.
- **Complications of medications -** inability to tolerate potential complications of long term usage of NSAID medications (e.g., stomach ulcers, heartburn, bleeding, dizziness, colitis, diverticulitis, kidney or liver disease, asthma, etc.).
- **Failure of other therapies -** failure to substantially improve after lesser joint surgeries (eg, arthroscopy, osteotomy) or with conservative (i.e., non-surgical) treatments such as cortisone injections, physical therapy, weight loss, bracing, use of a cane, etc.

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Permanent Activity Guidelines

Permanent activity guidelines following joint replacement surgery:

Approved:

- Walking
- Climbing stairs
- Moderate housework
- Light or moderate hiking
- Swimming
- Moderate weight training
- Riding a bicycle or a horse
- Repetitive aerobic stair climbing
- Bowling or golfing
- Dancing
- Doubles tennis
- Cross-country skiing
- Moderate alpine skiing

Not recommended:

- Singles tennis
- Repetitive lifting of 50+ pounds

Should be strictly avoided:

- Jogging or running
- All sports that involve jumping
- Basketball
- Contact sports
- Very heavy lifting
- High-impact aerobics

It is also very important for you to understand what you can and cannot expect from joint replacement surgery before deciding to proceed. In the end, more than 90% of individuals who undergo total joint replacement experience a dramatic reduction of pain and a significant improvement in the ability to perform common activities of daily living. A small portion of patients may have some amount of persistent discomfort.

A total joint replacement won't make you an athlete or allow you to do more than you could in the years before you started to develop arthritis. The goal is a return to comfortable and enjoyable activities of daily life.

Two additional factors are important in your decision. You need to understand what to do to protect your new joint and how your joint can be expected to function over time.

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Protecting a New Joint

Joint replacement can help you return to a fuller, more active life. But it is important that you not put unnecessary strain on your artificial joint or it could fail. High-impact activities, excessive body weight, and having a joint replaced at an early age are factors that will accelerate the normal wear of the artificial joint and surrounding bone and may cause it to loosen prematurely, becoming painful and unstable. The box on the previous page lists some representative activities that you will and will not be able to do following joint replacement.

Joint Function Over Time

You may also want to talk with your surgeon about how long your new joint will function over time. With proper care, most joint replacements perform well for 15 - 20 years or more. On average, the failure rate (a problem with the joint that requires revision surgery) is about 1% per year during the first 20 years after surgery. That is, within 15 years after your surgery you will have about a 15% chance of needing revision surgery to your joint. Revision surgery to repair bone loss and to replace worn or loose parts may be much more difficult than initial joint replacement surgery, and the outcomes are less predictable. That is why it's important for you to protect your artificial joint by following the instructions you are given.

While you are deciding about surgery or waiting for your surgical date, we recommend that you **remain as active as possible** - even if exercise causes some pain. Some people may try to "save" the joint by becoming very inactive. It's important to understand that this will actually have an opposite effect. Being inactive can cause you to lose bone and muscle strength. It also puts you at risk for weight gain and other declines in general health and mental wellbeing. People with arthritis who push themselves to remain active with walking, cycling, and swimming do best. However, be sure to avoid running, jumping, and heavy lifting activities.

Adapted courtesy of Beth Israel Deaconness Medical Center (Boston, MA).