

ASK THE DOCS

The Ins and Outs of Minimally Invasive Total Joint Arthroplasty

By Mark C. Hartley, MD; Mark P. Madden, MD; and Bruce S. Zimmer, MD

If walking, climbing stairs, and performing simple daily activities turns into a complicated process because of pain in the hip, knee, thigh, groin, or buttocks, osteoarthritis may be the culprit. Innovative minimally invasive total joint arthroplasty techniques can return patients to their normal lives sooner and with less pain.

What Causes Osteoarthritis and Its Associated Pain?

Generally, osteoarthritis results from a lifetime of wear and tear on the joints. As the most common type of arthritis, especially among older people, this condition can also result from an injury or developmental abnormalities of the hip.

Osteoarthritis affects the cartilage, the slippery tissue that covers the ends of bones in a joint. While healthy cartilage allows bones to glide over one another and absorbs energy from the shock of physical movement, in osteoarthritis patients, the surface layer of cartilage breaks down and wears away, allowing the bones under the cartilage to grind against each other. For some, the joint may lose its normal shape. The pain can also result in a limp, which puts strain

on other muscles and joints, placing them at risk for injury.

How Is Osteoarthritis Diagnosed and Treated?

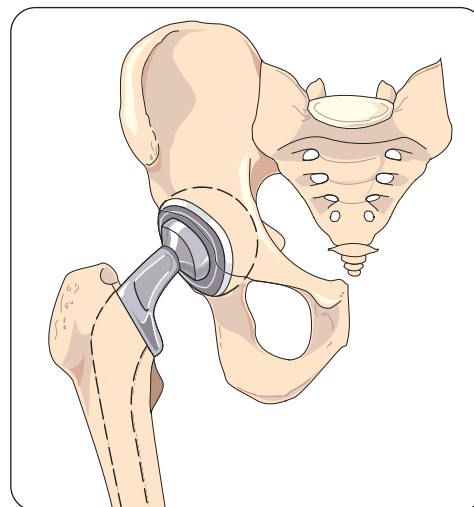
Diagnosing osteoarthritis is relatively simple. A combination of methods rule out other possible conditions. The first step is to determine the

patient's clinical history. At this point, the physician and patient discuss when and how the symptoms first occurred. Through a physical exam, the physician checks the patient's general health, including reflexes and muscle strength, and carefully examines the painful joint. Then, x-rays are taken to determine the extent of the joint damage.

Physical therapy and gentle, supervised yoga are sometimes recommended to alleviate the pain associated with osteoarthritis. These exercises help bring stability and lubrication to the hip joint as well as stretch and strengthen the surrounding muscles, which tend to tighten due to the joint's instability. For more severe osteoarthritis, surgery is often indicated.

What New Surgical Techniques Are Available?

A confirmed osteoarthritis diagnosis may warrant hip or knee replacement surgery. In fact, osteoarthritis of the hip is the most common diagnosis that leads to hip replacement. Over the years, joint replacement surgery has earned its place as one of the most successful orthopaedic procedures, as measured by patient satisfaction.



Anterior view of the pelvic skeleton where the bones comprising the ball-and-socket joint of the hip have been replaced with a prosthesis.

One of the newest and least invasive techniques for joint replacement is minimally invasive hip replacement surgery. While conventional hip replacement involves making a 10-inch to 12-inch incision to repair the hip, minimally invasive total joint arthroplasty is performed through one or two smaller incisions that measure only 3 inches or 6 inches each, depending on the patient's size and the procedure's difficulty.

The extent of soft tissue dissection is also less than with longer incisions. Physicians have adapted to this new procedure through training and experience, developing a new mindset to incorporate innovative instruments such as lighted retractors to achieve a better view of anatomical structures through smaller incisions.

The incision is usually placed over the outside of the thigh. Specially designed instruments prepare the socket and femur and place the implants properly. Using this technique, muscles and tendons are split or detached to a lesser extent than in traditional hip replacement surgery. They are routinely repaired after the implants are placed to promote healing and prevent hip dislocation.

A no-wear hip replacement (which is metal on metal instead of metal on plastic) uses a new surface that shows no evidence of wear after more than 30 million steps, or the equivalent of 30 years' use. This replacement is perhaps more expensive and potentially as long lasting as the traditional method, so it is generally geared more toward the younger patient. Often, older patients are best suited for the traditional replacement.

Minimally invasive knee replacement also produces smaller scars and a faster recovery than traditional total knee replacement. For some patients whose arthritis only affects one compartment of the knee, a partial knee replacement is often indicated. This procedure results in a smaller incision and leaves the healthy parts of the natural knee intact.

ORTHO FACT

According to the National Institute of Arthritis and Musculoskeletal and Skin Diseases, more than 20 million people in the United States have osteoarthritis. And by 2030, 20% of Americans — approximately 70 million people — will have passed their 65th birthdays, increasing their risk for the disease.

ORTHO FACT

Over the past 50 years, there have been many advances in total joint arthroplasty. Orthopaedic surgeons can replace painful, stiff hips with durable prostheses made of metal alloys, high-grade plastics, and polymeric materials. All materials used in total hip replacements have four characteristics in common:

1. They are biocompatible, meaning they won't create a local or a systemic rejection response.
2. They are durable, meaning they are resistant to corrosion, degradation, and wear and will retain their strength and shape for a long time.
3. They are functional, meaning they have mechanical properties that duplicate the replaced structures, such as the strength to handle weight-bearing loads, the flexibility to bear stress, and the ability to glide against each other.
4. They are high quality, meaning they meet the highest fabrication standards at a reasonable cost.

Source: American Academy of Orthopaedic Surgeons

What about Rehabilitation?

Recuperating from minimally invasive hip replacement is a shorter process than with traditional surgery. Hospital stays average four to five days for traditional hip replacement, with many patients requiring extensive rehabilitation afterward.

With minimally invasive procedures, the hospital stay is often as short as two days, and many patients are able to bear full weight on the affected leg within 24 hours. Crutches and other walking aids are usually used during the first few weeks.

Reston Hospital Center, Virginia Hospital Center, and Alexandria Hospital — all Commonwealth Orthopaedics & Rehabilitation locations — have implemented a comprehensive Total Joint Program that includes the involvement of preoperative education coordinators. Coordinators meet with patients and discuss

what to expect during the course of their stays at the hospitals and their rehabilitations.

An experienced anesthesia team reduces the hospital stay and provides pain management for a more comfortable recovery period. The Clinical Pathways Program helps patients get out of bed and dressed for rehabilitation early in the day to facilitate the recovery process.

What Innovations Does the Future Hold?

In the future, fluoroscopic (x-ray) and computer guidance for implant insertion is expected to make this operation, as well as patient recovery, even easier by allowing the physician to watch as the implant is guided to the proper spot on an x-ray screen. This technique splits the muscles but does not detach them.

The decision to have minimally invasive hip replacement surgery requires a thorough evaluation and discussion with the operating surgeon about the associated risks and benefits. [COR](#)



Mark C. Hartley, MD, graduated from Georgetown Medical School and received his orthopaedic surgery training, orthopaedic residency, and surgical internship at Georgetown University Hospital. He completed additional hip and knee replacement training at Union Memorial Hospital in Baltimore. Dr. Hartley is a Fellow in the American Academy of Orthopaedic Surgeons and the American College of Surgeons. He is also a member of the American Association of Hip and Knee Surgeons.



Mark P. Madden, MD, graduated from Georgetown Medical School and served as Chief Resident of Orthopaedic Surgery at Georgetown University Hospital. He is a member of the American Medical Association, Medical Society of Virginia, Medical Society of Northern Virginia, Virginia Orthopaedic Society, Southern Medical Association, and Southern Orthopaedic Association.



Bruce S. Zimmer, MD, graduated with his medical degree and completed his residency at the Medical College of Virginia in Richmond. He is board certified by the American Board of Orthopaedic Surgery and is a Fellow of the American Academy of Orthopaedic Surgeons. Dr. Zimmer is a member of the American Academy of Orthopaedic Surgeons and the Medical Society of Virginia.