

# Joint Replacement Center

at Cooley Dickinson Hospital



## Understanding What's New In Joint Replacement

## Minimally Invasive Surgery

There has been much discussion in the media about minimally invasive joint replacement surgery. A better way to describe this would be minimal incision joint replacement. Whether you have a traditional 10- or 12-inch incision, a single, smaller 4- to 6-inch incision or two, 2-inch incisions, this is still an invasive surgery that requires cutting bones, parting deep tissues and implanting fairly large metal parts. Specialized instruments, and in some cases, X-rays and computers, are needed to accomplish joint replacement using small incisions. The longterm risks and benefits of smaller incisions have not yet been shown to represent any improvement over traditional incisions, but some people report less pain, shorter hospital stays and faster rehabilitation in the early period after surgery. Whether a surgeon uses a traditional or mini incision, most muscles, tendons and ligaments are parted, not cut. Not everyone is a candidate for very small incisions. This method works best on thinner people. A mini, two-incision hip replacement may take two or three times as long to perform. Potential disadvantages are soft tissue damage from forceful retraction of tissue and implant malposition due to poor visualization. It is important that a surgeon be skilled and experienced in whichever technique is used. One less day in the hospital is not as important as a good, solid, long-lasting joint replacement!

## Hip Resurfacing

Hip resurfacing, or surface replacement, was first attempted in 1973. At that time, results were poor and the technique was abandoned by most surgeons. With recent improvements in instruments and materials, there has been a resurgence in hip resurfacing. Like a total hip replacement, this surgery involves placing a new cup in the pelvis. The difference is that the entire head of the femur is not removed. Instead, it is shaved and fitted with a new cap. This is a lengthy surgery and relies on good bone in the neck of the thigh bone. This area can be fragile in many women. Again, longterm studies are not available. This surgery may be a new choice for younger patients with good bone. The advantage would be leaving more preserved bone if a total hip replacement is needed in the future.

## Joint Replacement Centers

Studies show that well-prepared patients who receive close attention by an experienced joint replacement team have better outcomes. This is the theory behind Cooley Dickinson's Joint Replacement Center, the Pioneer Valley's only all-inclusive joint replacement center. The eight-bed center on the fourth floor of the new North Building is devoted to total joint replacement, from surgery and recovery to rehabilitation. A dedicated team of experienced surgeons, physical and occupational therapists and nursing staff specialize in getting patients back on their feet.

## Conclusion

The search for new materials and techniques to refine the practice of joint replacement will continue, but a motivated, well-informed patient remains a key factor in the success of surgery. We hope this information encourages you to discuss your concerns with an orthopedic surgeon.

## Our Affiliated Practice

**Hampshire Orthopedics**  
(413) 586-8200

Henry Drinker, M.D.  
Jonathan Kurtis, M.D.  
Joseph Lellman, M.D.  
Daniel McBride, M.D.  
Bernard Rerri, M.D.  
William Lohrer, M.D.  
Maurice Bernaiche, D.O.

COOLEY DICKINSON HOSPITAL

Member of  DARTMOUTH-HITCHCOCK ALLIANCE

Cooley Dickinson Hospital  
Joint Replacement Center  
30 Locust St., Northampton, MA 01061  
(413) 582-2534  
[www.cooley-dickinson.org](http://www.cooley-dickinson.org)

5/07

COOLEY DICKINSON HOSPITAL  
Member of  DARTMOUTH-HITCHCOCK ALLIANCE

## Innovations In Joint Replacement

Both total knee and total hip replacement are orthopedic success stories that have enabled hundreds of thousands of people to live fuller, more active lives. Orthopedic surgeons are able to replace damaged, dysfunctional cartilage and bone with a smooth, long-wearing prosthesis. Over the past few decades, there have been many advances in design, construction and implantation of the prosthesis resulting in successful long-term outcomes. Today, total joint replacements have a 90 percent chance or greater of lasting a minimum of 15 years.

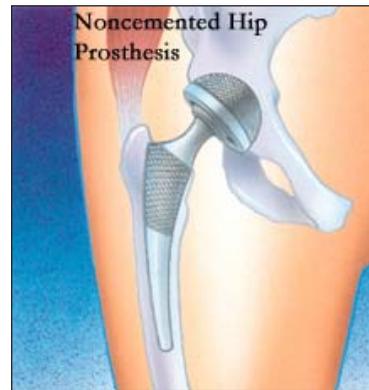
## Implant Design and Construction

Several manufacturers make total hip and knee implants in many sizes and styles. The type used by your doctor or hospital depends on several factors, including your needs (based on age, weight, activity level, bone quality and health), the doctor's experience with the device and the cost and performance record of the implant. All implants have these factors in common:

- ◆ They are biocompatible; that is, they can function in the body without creating a rejection response.
- ◆ They are resistant to corrosion and wear, so they will retain their shape and strength.
- ◆ They have mechanical properties that duplicate the structures they replace.
- ◆ They meet the highest standards of fabrication and quality control.

## Materials and Wear

Both hip and knee implants are mostly made of titanium or a cobalt/chromium-based metal. High density polyethylene is also part of many replacements. Knee replacements have a high density polyethylene plate on top of the metal piece that covers the tibia or shin bone. The back of the kneecap is usually resurfaced with a polyethylene button. In knees, these materials do not vary much from brand to brand.



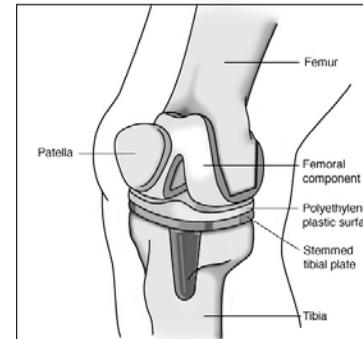
In hip replacements, the lining of the socket is frequently made of high-density polyethylene. Recently, ceramics are being used for both the lining of the hip socket and to replace the "ball" portion of the femoral

(thigh) component. Another choice is an all-metal hip. The metal and polyethylene hip is "tried and true" and has a survival rate of 80 percent at 20 years. The ceramic and all-metal choices for hips are newer and show the possibility of longer wear in laboratories, but studies demonstrating "real-life" wear over time do not exist yet. It is true that all hip and knee implants last longest when patients are not overweight and engage in moderate physical activity.

## Cement Vs. Cementless Hips

Most implants are fixed to the bone using an acrylic polymer called polymethylmethacrylate. In the 1980s, cementless hip implants were introduced. These implants have a textured surface that allows bone to grow onto the implant. Depending on the design, these hip implants may also have small screws, spikes or fins that hold them in place while bone is attaching. While the cementless hip has the potential to last longer, this type of hip is slightly larger and depends on good bone.

## New Designs and Advertising



The basic design of implants has been refined over time and is similar from brand to brand. In order to distinguish themselves, some

companies are advertising slight differences directly to the public. An example of this is "gender-specific knees." Knee replacement has long been highly successful for men as well as women, and all companies make their implants in a variety of sizes. Surgeons agree the most important factor is measuring and fitting each individual's knee appropriately.

Knees with a rotating platform or mobile-bearing surface are also available. In these models, the polyethylene plate atop the metal

tibial piece moves or rotates slightly. Theoretically, this movement will reduce wear. While these two types of knee replacements show wear in different places, at this time, most studies show similar rates of wear. Another type of knee you may see advertised is the high-flexion knee. This knee may be able to accommodate a greater degree of flexion (bend) but only if the individual is capable of high flexion. Most standard knee replacements can accommodate 120 degrees of bend, and individuals are able to kneel, garden, ride bikes and climb stairs with them.

## Unicompartmental Knee Replacement

A unicompartmental knee is sometimes called a partial knee replacement. This is because the cartilage is replaced on one side, or compartment, of the knee. Both the end of the thigh and shinbone receive metal replacement parts, but only on either the outside (lateral) compartment or the inside (medial) compartment. This is only considered if the rest of the cartilage in the knee is in good shape. The unicompartmental knee was controversial when it was introduced about 30 years ago, but success rates have improved with better patient selection and improved designs. A new type of unicompartmental knee called the Oxford® knee also has a mobile-bearing surface. Because all unicompartmental replacements are much smaller than total knee replacements, they usually require smaller incisions.