



# Louisville Orthopaedic Clinic

**Hip and Knee  
Joint Replacement:  
State-of-the-Art  
Implants Available to  
the Surgeon and  
Patient** page 8

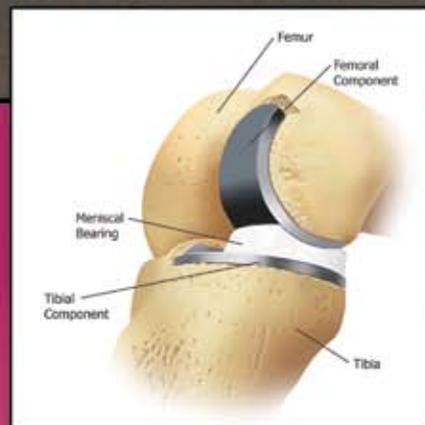
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Using a Large Head  
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## The Oxford Partial Knee Replacement

by Richard A. Sweet, M.D. • page 12



### Non-union risk factors:

Smoking



Advanced age



Diabetes



Large fracture gap



NSAIDs



Obesity



EXOGEN<sup>◊</sup> ultrasound treatment has the highest heal rate for non-unions, including patients with certain comorbidities<sup>1</sup>



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<sup>1</sup> Highest rate of healing reported among pre-market approval submissions to FDA based on variable fracture types, sites and conditions. See EXOGEN – PMA 900009 – 10/05/1994, EXOGEN – PMA 900009, Supplement – 02/23/2000, Bioelectronic – PMA P850022 – 02/18/1986, EBI – PMA P790002 – 11/06/1979, Orthofix/AME – PMA P850007 – 02/21/1986, Orthologic – PMA P910066 – 03/04/1994, EBI – PMA P790005 – 01/25/1980.

<sup>2</sup> Heckman JD, Ryaby JP, McCabe J, Frey JJ, Kilcoyne RF. Acceleration of fibial fracture-healing by non-invasive, low-intensity pulsed ultrasound. *J Bone Joint Surg Am.* 1994 Jan;76(1):26–34.

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<sup>3</sup> A non-union is considered to be established when the fracture site shows no visibly progressive signs of healing. Rx only.

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# Greetings from

## THE ADMINISTRATOR OF LOUISVILLE ORTHOPAEDIC CLINIC



We welcome you to the third edition of the Louisville Orthopaedic Clinic Magazine. It is our way of providing you with valuable information in the advancing field of orthopaedic surgery. The Louisville Orthopaedic Clinic and Sports Rehabilitation Center's goal is to provide comprehensive care for specialized orthopaedic needs, in a caring and pleasant atmosphere.

The group began in 1974 with three orthopaedic surgeons. Today our facility includes nine orthopaedic surgeons, two physician assistants and two nurse practitioners. Our surgeons are board certified in orthopaedic surgery and have completed specialized training in custom total joint replacement; arthroscopic procedures of the knee, shoulder and ankle; surgery of the spine; foot and ankle disorders and sports medicine. To better accommodate the needs of our patients, we have an open MRI, outpatient surgery suites and a physical therapy department. Digital x-ray equipment and registered technicians insure the highest quality images possible to aid in the diagnosis and treatment of our patients.

As part of our sports medicine program, we are team physicians for Ballard, KY Country Day, Manual, Sacred Heart and St. Xavier High Schools along with Spaulding University providing sports physicals and urgent care. We are dedicated to providing education and treatment to the community.

Our comprehensive website at [www.louisvilleorthopedic.com](http://www.louisvilleorthopedic.com) offers a wide range of features which includes; general office information, detailed educational background on physicians, new patient registration forms, MapQuest driving directions and e-mail interaction for non-urgent medical request. The website also provides patients with the resources they need to understand their condition and their treatment options. Our physicians participate in numerous research studies; contribute to medical journals and publications, all accessible on our website.

It is our sincere hope this issue of the Louisville Orthopaedic Clinic Magazine provides you with the information needed to make decisions regarding your orthopaedic care.

We look forward to serving you in the future.

Deborah Martin  
*Administrator*



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**Benefit of the Exercise Versus  
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**A HIP REPLACEMENT  
FOR A LIFETIME**

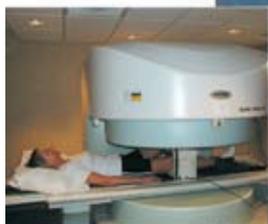
Three alternative options — see if  
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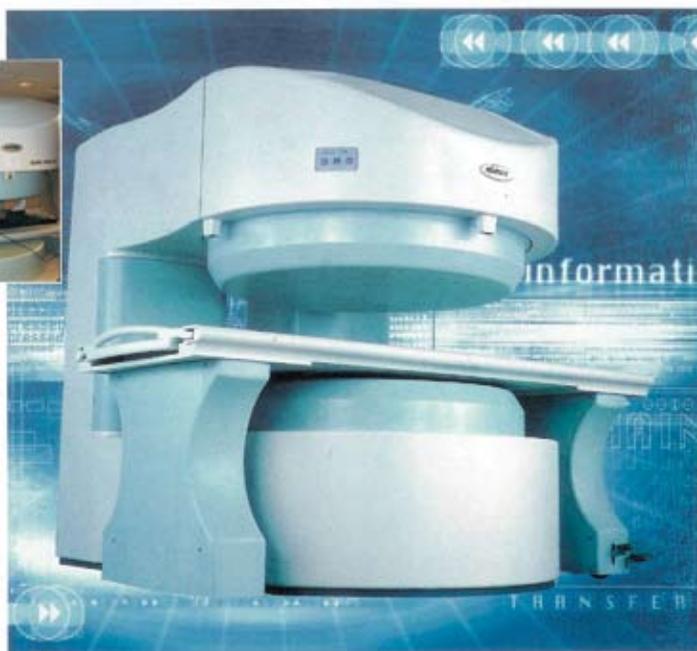
## Louisville Orthopaedic Clinic offers Open MRI

# **Superopen 0.35T**

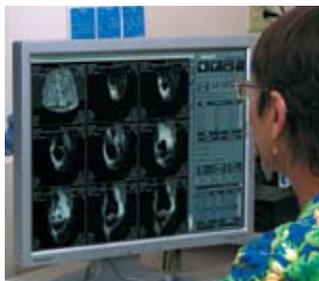
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# Hip and Knee Joint Replacement:

## State-of-the-Art Implants Available to the Surgeon and Patient

In the United States, we are well into the fourth decade with hip replacement and the third decade in the knee implant. There has been a constant improvement evolving from continued research and development by many surgeons, and particularly our orthopaedic companies. Due to the information age now, patients have more insight in decision making not only with their surgeon, but with the various implant variables.

### TOTAL HIP REPLACEMENT

Titanium implants have long been a friend to bone, and are excellent in permanent union in the hip socket and femur. Initially used more in younger patients, under 70, these newer types of hip replacement can be performed at practically any age. Where there is poor bone quality, cement may still be necessary.

Various materials, such as highly polished chrome cobalt and ceramic have replaced the old plastic sockets with the metal/metal hips. The mega or large head replacements are nearly the same as the ball and socket being replaced in the human. These large head sizes are not only more stable (resistant to dislocation), but have better wear characteristics. Initially these were used for younger patients, but now can be used well into the 70's depending upon the health and bone density of the patient.



**Summit metal**



**Summit ceramic**



**TaperLoc**



**Magnum TaperLoc**

Resurfacing, a procedure that came into vogue in the late 70's and again in the late 80's, has been put back on the shelf by many surgeons throughout the country and in Europe. However, it is now making another entry with different materials, although with the same surgical technique.



**Cemented femoral head**



**Recap**

While resurfacing of the hip minimizes the amount of bone taken, the procedure itself involves significant trauma to the ligaments and the circulatory status of the hip, predominantly the ball portion of the joint. The socket must be reamed and the ball joint of the hip must be fashioned in a perfect hemisphere to allow implantation of a metal surface. A difficulty of this procedure in past years has been a high failure rate due to loss of circulation within the bone, loosening of the “head cover”.



**Inside spread**

In the very young patient, such as 25 or 30 with adequate bone and circulation, this may be a wise choice. If it fails, changing to a complete hip replacement is not the same degree of health issue as in an older counterpart.

With the new uncemented hip replacements using the large metal/metal or ceramic heads, a laboratory durability of 25 to 30 years, there may be little to gain from a procedure that has a more questionable lifespan.



**ASR-XL blowout**



**BioloXdelta**



**Stem cup combo**

## TOTAL KNEE REPLACEMENT

The most dramatic improvement in technology and long-term results has been in the knee. Some of our cemented hips from 28 years ago or more are still functioning quite well while the average lifespan of a knee should be in the 15 to 20 year or more category now. This has not always been the case.

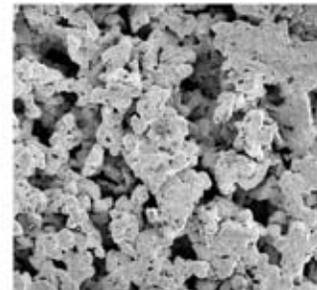
Modern knee replacement includes a traditional type of joint, with or without cement, a hemi or partial knee replacement, using with cement, and a rotating platform type of knee with or without cement. These are all major procedures, but with minimum or no muscle involvement in the surgery, recovery has been more rapid and with fewer complications. Uncemented knees in the younger, more active patients are becoming more popular and several companies are working actively on improving the rate of success of bony ingrowth into a knee implant.



**Oxford**



**Side view**



**Magnification**



**Inside spread**

The rotating platform type of knee has specific indications for the younger and more active individual, but is a more complex procedure.

The partial or hemi knee can be very successful for many years, perhaps 10 to 15. However, it does present the possibility of failure within a few years, thus leading to a complete knee replacement. Computer-assisted knee replacement has had increasing interest in surgeons, although in my experience at many of the knee centers around the country it is used only on occasion. Technical ability, successful results, and higher surgery numbers by the surgeon may dictate the need for computer usage.

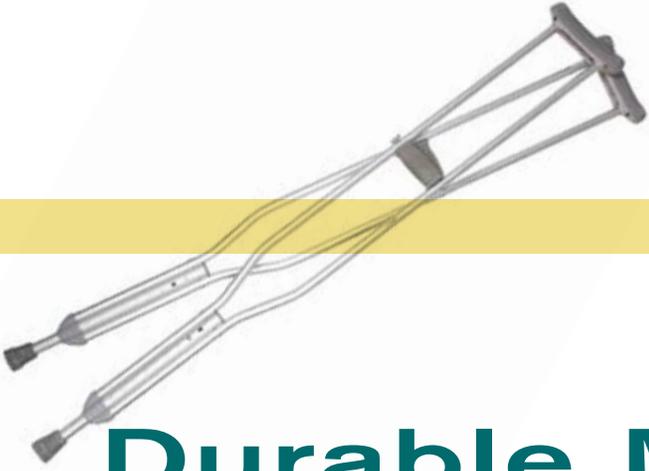
## CONCLUSION

Orthopaedics is now at an age where hip and knee replacements offered to patients are very successful. Increasing numbers of uncemented hip replacements, with large head size and avoidance of plastic has made this a more life-long experience. While the knees do not quite have the longevity of the hips, the progress of uncemented joints is now available on the horizon and with replaceable plastic parts of the knee, permanent solution may be possible.

Joint replacement is an everyday event now, but remains a complex and difficult procedure in providing excellent results. Patients must be as selective in the physician as the type of implant.



**Brain lab system**



MIKE PARSON, ATC

# Durable Medical Equipment Services at Louisville Orthopaedic Clinic

Louisville Orthopaedic Clinic has taken a new approach to providing our patients with everything they need. Offering ancillary services is an emerging trend among orthopaedic practices and Louisville Orthopaedic is no exception. In addition to diagnostic imaging, physical therapy and surgical facilities, we also offer a wide array of durable medical equipment. Durable medical equipment, or DME, includes items such as braces, crutches and splints. We offer a full range of over 80 DME items, including prefabricated splints and supports, custom made braces, crutches and walkers, bone growth stimulators, and passive motion devices.

Unlike many offices, we have a dedicated member of our staff who oversees our DME program. Mike Parson is a certified athletic trainer with eight years experience in orthopaedics. He has worked with collegiate and high school sports, and in physical therapy clinics. Mike works closely with our physicians, physician assistants, and nurse practitioners to provide the highest quality medical devices that are most appropriate for a patient's condition. Mike also works with our insurance and billing staff to ensure that any necessary prior authorization is obtained.

With braces and splints for almost every body part, we are able to meet our patients' needs in most cases. We have braces and supports for the care of sprains and strains, immobilizers and splints for post-surgical and fracture care, and crutches and walkers for mobility assistance. Bone growth stimulators are available for treatment of complex or nonhealing fractures, and passive motion devices for certain postoperative conditions. Our physicians, physician assistants, and nurse practitioners will determine what, if any, DME is appropriate for our patients' conditions.





## THE OXFORD PARTIAL KNEE REPLACEMENT: The Normal Feeling Replacement

Each year hundreds of thousands of Americans with painful arthritic knees face the prospect of knee replacement surgery. Recent advances in minimally invasive techniques have shortened the rehabilitation period while advances in implant design have improved overall clinical results. However, patients with successful and pain free knee replacements often report that the new knee still does not feel “normal”. This is in part due to the fact that the anterior cruciate ligament (ACL) is sacrificed in all complete knee replacement designs. The result is that the artificial knee does not have the same stability or kinematics through the arc of motion as does a normal knee.

For many patients the “partial” knee replacement may be an appealing alternative. This procedure, also known as the “hemi” or “unicompartmental” knee replacement, has several potential significant advantages. These include:

1. Preservation of the bone and cartilage of healthy and normal compartments of the knee.
2. The operation is more amenable to the “minimal incision approach” leading to faster recovery and rehabilitation, a quicker return to full activity, and a shorter incision. Usually the surgeon can completely avoid cutting into the quadriceps tendon or muscle, and it is the sparing of the quad mechanism that is the key surgical step in making the approach “minimal” in nature.
3. Perhaps the most significant advantage of partial knee replacement is the preservation of the anterior cruciate ligament (ACL). The ACL is routinely sacrificed in all full knee replacement procedures. Sacrifice of the ACL in full knee replacements can lead to the sense of knee being somewhat “lax” or loose. Hemi knee replacement patients, on the other hand, typically find their new joint feels much more like the normal knee due to the preservation of the ACL and of normal knee stability.

To be considered for partial knee replacement surgery, strict indications must be fulfilled. Patients should have activity and rest pain severe enough to justify surgery. Patients with mild to moderate pain that can be controlled by other measures such as use of nonsteroidal anti-inflammatories (NSAIDs), steroid (cortisone) injections, viscosupplementation hyaluronate injections (Synvisc, Hyalgan and others), or arthroscopic surgical measures should not be considered for partial arthroplasty. The pain should primarily be located

over the inside of the knee joint. Special x-rays of the knee can be performed in the office to help confirm the location of the arthritis. And the anterior cruciate ligament (ACL) must be intact.

## **THE OXFORD MOBILE BEARING PARTIAL REPLACEMENT:**

### **THE SOLUTION TO PAST UNICOMPARTMENTAL PROBLEMS**

Partial knee replacements have been performed in some fashion for over three decades with varying success. Older implant designs have been subject to the twin problems of cement loosening and plastic wear. A new implant has been designed to address these problems. This implant is the Oxford Mobile Bearing Partial Knee. Developed by surgeons in Oxford, England almost 20 years ago, it was released by the FDA for use in the United States in April of 2004. The Oxford group has reported long term clinical data demonstrating the increased durability and dependability of the mobile bearing design.

There are two major differences between the Oxford Knee and other hemi knee replacements. These include:

1. The polyethylene plastic articular insert is “mobile”. In previous partial knee replacement designs the plastic bearing surface is fixed rigidly to the underlying metal tibial base and / or bone. Every day normal active use of the knee as it bends and rotates applies sheer stress to the plastic of these fixed bearing implants. These stresses are transferred directly to the bone cement interface which can lead to early loosening of the cement from the bone. In the Oxford Mobile Bearing Knee the plastic insert is allowed to freely “float” on top of the tibial base. The stresses to which the knee is exposed are absorbed by the mobility of the plastic insert thus protecting the underlying bone cement interface. Thus, the Oxford implant is much more resistant to the forces leading to implant loosening. The result is an implant that is much more durable and long lasting than any previous partial knee replacement design.

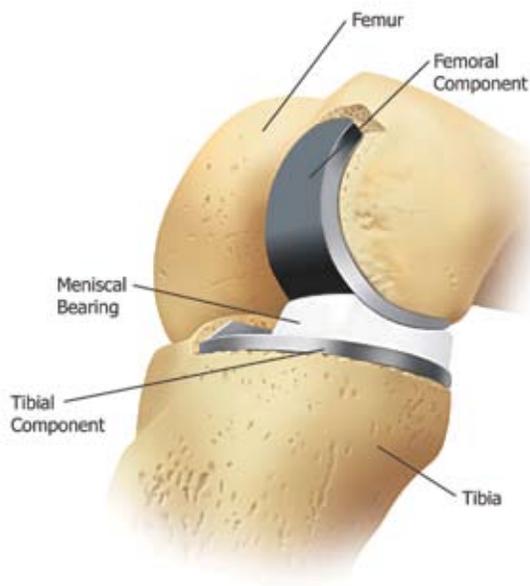


**Figure 1. Front View of the Oxford Partial Knee Replacement Implant**



**Figure 2. Side View of the Oxford Implant**  
The plastic (polyethylene) insert can float freely on its underlying metal base plate minimizing stress on the cement.

2. Because the plastic insert is mobile, it can be designed with a curved articular surface exactly conforming to the curve of the femoral implant. This spreads the weight bearing out over the entire plastic polyethylene surface thus reducing wear. Extensive studies from England's Oxford group have confirmed that the wear rate of the plastic in the Oxford Mobile Bearing Knee is extremely low.



**Figure 3. The Oxford implant replacing only the arthritic inside (medial) part of the knee leaving the rest of the knee and the ACL intact.**

uninvolved in the arthritic process. The result is the maintenance of normal knee stability leading to a joint that feels more “normal”. The hemi knee replacement is especially amenable to minimal incision surgical techniques thus shortening the hospital stay and the rehab period. In short, patients recover much more quickly after partial knee replacement surgery. The twin problems of wear and loosening of past hemi replacement designs appear to have been solved by the unique features of the Oxford Mobile Bearing design.

Clinical follow up data from the Oxford group demonstrates the successfulness of the mobile bearing hemi-replacement design concept. The problem of poly (plastic) wear seems to largely be eliminated. The problem of loosening has similarly found to be minimized or nearly eliminated through the first decade of follow up. Over 95% of the implants followed survive the first decade of use without failure. Other European centers have reported similar results. Encouragingly, early U.S. results seem to support and match the long term European data

In conclusion, the partial (hemi) knee replacement is an inherently appealing option for the treatment of isolated medial compartment arthritis of the knee. As opposed to the standard full tricompartmental knee replacement, the hemi replacement preserves the anterior cruciate ligament and the bone and cartilage of the parts of the knee

## FAQS: Oxford Mobile Bearing Partial Knee Replacement

### 1. When it is time to consider knee replacement surgery?

Patients suffering from arthritis of the knee often are faced with the prospect of undergoing knee replacement surgery. Once it is determined that activity and rest pain is severe enough, then this surgery can be considered as a treatment option. Patients with mild to moderate arthritic pain that can be controlled by other measures such as the use of nonsteroidal anti-inflammatories (NSAIDs), steroid (cortisone) injections, viscosupplementation hyaluronate injections (Synvisc, Hyalgan and others), or arthroscopic surgical measures should not be considered for any type of knee replacement.

### 2. Are there alternatives available to a full knee replacement?

Some patients may have an alternative to the complete knee replacement. One of the most common forms of knee arthritis is that isolated to the medial or inside part of the knee. Patients with this common type of arthritis may be candidates for a less invasive procedure, the “partial” or “hemi” knee replacement.

### **3. Which patients are candidates for “partial” knee replacement surgery?**

Partial or hemi knee replacements are indicated for patients with arthritis isolated to the inside or medial aspect of the knee. This condition can be confirmed by x-rays. Patients considering partial knee replacement must have an intact anterior cruciate ligament (ACL).

### **4. Is the partial knee replacement appropriate for older age groups?**

The partial knee replacement can be particularly appealing for an older patient due to the quick recovery and the minimum amount of physical therapy required.

### **5. What is the biggest advantage of partial knee replacement versus a full knee replacement?**

Probably the single biggest advantage of the partial knee replacement is preservation of the anterior cruciate ligament, which is routinely sacrificed with full knee replacement surgery. Sacrifice of the ACL, which occurs in all full knee replacements, can lead to the sense of the knee being somewhat “lax” or loose. Due to the preservation of the ACL, partial knee replacement patients typically find their new joint feels much more like the normal knee.

### **6. Are there other advantages to partial replacement surgery?**

There are other potential advantages of partial or partial knee replacement surgery. These include preservation of healthy, non-arthritic parts of the knee, which are not replaced in a partial knee replacement. Also the operation is more amenable to the “minimal incision surgery”. This leads to a much faster recovery and rehabilitation, a quicker return to full activity, and a shorter incision.

### **7. What unique features of the Oxford Mobile Bearing knee make it so appealing over previous partial knee replacement implant designs?**

As opposed to other partial knee replacement designs, the plastic insert or cushion of the Oxford knee is “mobile”. It is allowed to freely “float” on top of the cemented metal tibial base as the knee flexes and extends. Sheer stresses that otherwise would be absorbed by the cement fixation to the bone are instead absorbed by the mobility of the plastic insert. This protects the underlying bone cement interface from loosening. The result is an implant that studies have shown to be as durable and long lasting as a full knee replacement. And because the plastic insert is mobile, it can be designed with a curved articular surface exactly conforming to the curve of the femoral implant in all planes. This nearly eliminates plastic wear, which has been a significant problem of previous partial “fixed” bearing knee replacement designs.

### **8. What should I expect during my hospital stay?**

The hospital stay for a partial knee replacement is brief. Many patients are discharged as soon as 24 to 36 after surgery. Patients are kept comfortable after surgery by nerve blocks administered by the anesthesia team just prior to the operation. Antibiotics are given just before and after surgery to prevent infection. Blood thinners are utilized for 2 to 3 weeks after surgery to prevent blood clots.

### **9. What is involved in the rehabilitation and therapy program postoperatively?**

Full weight bearing is immediately allowed and started the evening of the operation. Range of motion and strengthening exercises are also started immediately. The walker or crutches may be discarded as soon as tolerated (often at the end of the first week). Physical therapy is necessary for only a few weeks. Light recreational activities such as golf are allowed as soon as the swelling and soreness has subsided, usually by 4 to 6 weeks.

KATHERINE S. HAMILTON, PA-C



## MID-LEVEL PRACTITIONERS: Physicians Assistants and Nurse Practitioners at Louisville Orthopaedic Clinic

Many cutting-edge orthopaedic surgeons are increasingly utilizing mid-level practitioners to aid in improving the quality of care for their patients. At Louisville Orthopaedic Clinic, Physician Assistants (PA's) and Nurse Practitioners (NP's) have been added to fill this role.

Mid-level practitioners perform physical exams, diagnose and treat musculoskeletal complaints, order and interpret tests, assist in surgery and write prescriptions. PA's and NP's exercise autonomy in medical decision making and provide a wide range of therapeutic services. They work as a medical "team" and see many of the same type of patients as their supervising physician. Often PA's and NP's refer to and/or have close consultation with their supervising physician to treat more difficult orthopaedic cases.

Access to care is a common complaint patients have with their physician. Patients with acute injuries or pain can get same-day or near same-day appointments with the addition of PA's and NP's. Mid-level practitioners are licensed to perform injections and apply casts or splints for common musculoskeletal complaints. If surgery or more definitive treatment is needed, the mid-level practitioner refers to the supervising physician.

Another valuable advantage to PA's and NP's is the increase in time spent with patients. They help patients better understand their diagnosis and provide information on different treatment options. Our goal at Louisville Orthopaedic Clinic is for patients to feel more satisfied and informed after their office visit.

Demanding schedules of orthopaedic surgeons often takes them out of the office and into the operating room. PA's and NP's can help answer telephone messages and refill prescriptions to avoid any delays in treatment.

Mid-level practitioners are representatives of their physician, treating patients in the same style and manner as their supervising physician. Their advantages are becoming more recognized across the country. At Louisville Orthopaedic Clinic our number one priority is the patient. The addition of mid-level practitioners, along with the area's most skilled orthopaedic surgeons, help us deliver the best quality of care for our patients.



“Why get a total knee  
if you only need  
a **partial?**”

Mary Lou Retton  
1984 Olympic Gold Medalist  
Biomet Joint Replacement Patient

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## Louisville Orthopaedic Surgeon Dr. George Quill Designed Medical Tool Now Used World-Wide **Revolutionizing Surgical Ankle Treatment**

Louisville Orthopaedic Clinic's George E. Quill, Jr., M.D., one of the region's first fellowship-trained orthopaedic surgeons sub-specializing in disorders of the foot and ankle, set out to fulfill an orthopaedic niche and succeeded in designing a medical tool now used world-wide to relieve pain and improve function in patients with severe deformity.

When pain treatments fail, patients who have worn away the cartilage between their ankle bones have limited options. While total knee replacements are quite common, total ankle replacements are not, primarily because they only last five to seven years. Dr. Quill wanted to provide relief to patients who had run out of options. "This creation has been especially gratifying," the doctor explains. "I worked with a manufacturer to design something I thought could fill a medical niche – helping people who are otherwise candidates for amputation – and now see the design used all over the world."

Traditional arthrodesis (pronounced ar thro dee sis) dates back to 1882 and involves aligning the ankle and hindfoot joints in the most functional position and fusing them – relieving pain, but causing the patient to lose motion in the joint. Because of his extra training in the foot and ankle, polio and diabetic patients, and others making a last ditch effort to save their feet, were referred to Quill. With the use of the medullary nail, these patients have seen a dramatic change in their lives. In fact, according to Dr. Quill, less than half of patients limp after arthrodesis with the nail.

The medullary nail works like an internal splint, inserted through the bottom of the foot. Medullary actually means internal core of bone – where the nail is placed. The procedure boasts less



postoperative pain, diminished cast time, improved accuracy, and titanium strength. Polio and diabetic patients aren't the only ones benefiting: persons with osteoarthritis, rheumatoid arthritis, severe trauma, and neuromuscular diseases are finding great relief as well.

Dr. Quill shares an interesting history of the medullary nail. During World War II, German fighter pilots were seen with very fresh leg wounds. Turns out, these pilots had been surgically treated with medullary nails and put right back into battle. "The method was reliable and quick then and that same technology can now save even a horrendous case from amputation," he explained.

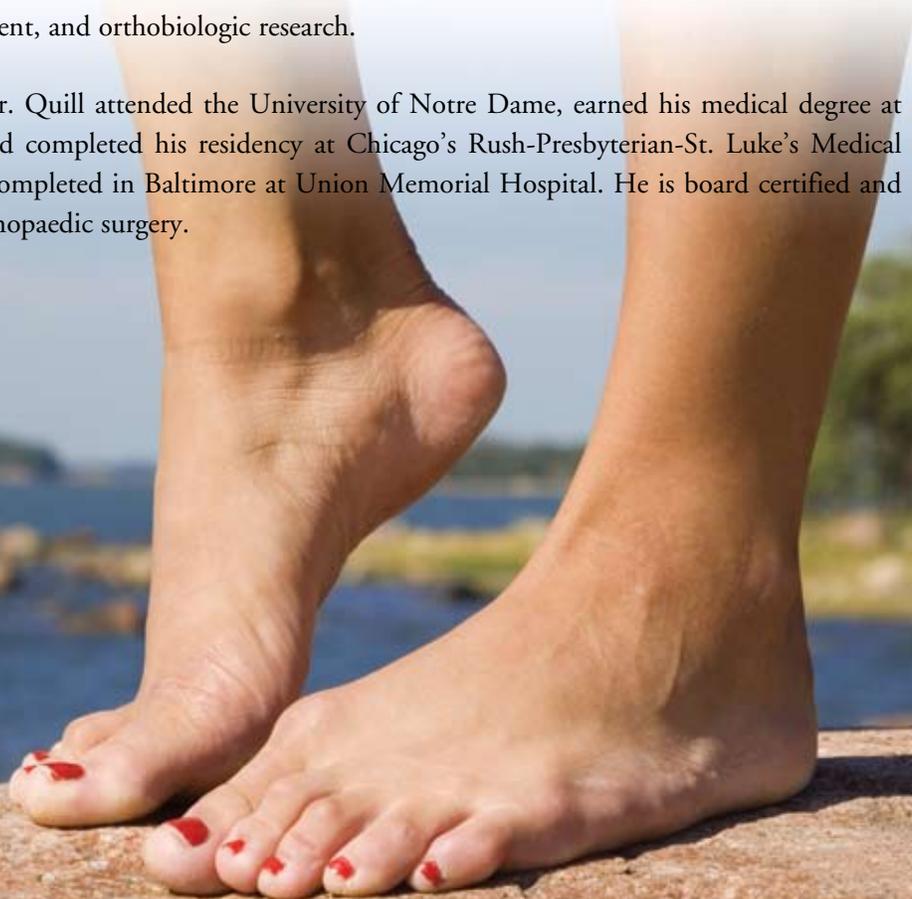


More than fifteen years ago, Dr. Quill began performing ankle arthrodesis with medullary nails intended for the femur. He inserted the femur nail backwards into the ankle until 1998 when his ankle-specific creation was complete. This fall, the second generation design – a refined version – will be released.

Dr. Quill gives many scientific presentations each year on the subject of foot and ankle disorders, and is a member of the clinical faculty at

the University of Louisville School of Medicine. Current interests are in foot and ankle reconstruction, orthopaedic device development, and orthobiologic research.

Born in Chicago, Illinois, Dr. Quill attended the University of Notre Dame, earned his medical degree at Northwestern University, and completed his residency at Chicago's Rush-Presbyterian-St. Luke's Medical Center. His fellowship was completed in Baltimore at Union Memorial Hospital. He is board certified and voluntarily re-certified in orthopaedic surgery.





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# Puzzled

## about making the right choice for Rehabilitation?

After orthopedic surgery many patients may need additional care before returning home. They need a stepping-stone on the road to recovery. Nearly 20% of patients leaving the hospital need a post-hospital setting that provides additional nursing or rehabilitation care before they go home. But sorting through the many terms for options can be confusing, such as, 'nursing home care', 'skilled nursing care', and 'sub-acute rehabilitation'. Many of today's nursing homes do not fit the stereotype of traditional nursing homes. Some nursing homes have evolved into *sub-acute rehabilitation* centers. These are found inside nursing homes (or skilled nursing facilities).

But what is "sub-acute care"? According to the American Health Care Association, sub-acute care is comprehensive inpatient care designed for someone who has an acute illness, injury or exacerbation of a disease process. Sub-acute rehabilitation requires an interdisciplinary team which includes a physician, nurse practitioner, nursing staff, physical, occupational and speech therapist, dietitian, case manager and social worker to help manage the patient's total care. Patients receive high quality care under the management of this interdisciplinary team.

Statistically, patients entering sub-acute rehabilitation in the past tended to be older and in the end required long term care. Today however, you will see a younger generation that requires short-term rehabilitation and will return home to their highest practicable level after experiencing an acute illness or injury.

Sub-acute rehabilitation is more intense than offered in the traditional nursing home. Often, patients who receive sub-acute care tend to have more complex medical conditions and require more highly skilled care. Today's sub-acute rehabilitation units have the look and feel of hospital medical/surgical floors from years ago. This stay assists in transitioning the patient from a complex medical condition or rehabilitation to becoming more independent before they return home.

Sub acute programs offer an expanded level of services for patients in need of short-term rehabilitation. Most sub-acute programs are well suited for patients who may not be medically ready for a full day of intensive rehabilitation in an (acute) rehabilitation hospital. The patient generally receives two or more therapy disciplines with 2-3 hrs of therapy per day in a sub-acute setting.

Patients requiring rehabilitation after debilitating conditions such as stroke, cancer, trauma, orthopedic procedures, brain injuries and spinal cord injuries, neurological disorders and cardiopulmonary conditions are all possible candidates for sub-acute care. To be covered by insurance, the services must be medically necessary with regular documentation supporting significant progress toward treatment goals. The goals are to be quantifiable and attainable for each individual patient's needs.

Many programs are flexible enough for patients just beginning their rehabilitation or continuing their rehabilitation program. Sub-acute care can also be used as a continuation of therapy after their acute/hospital rehabilitation if the patient has not fully met their goals prior to returning home. Patients are required to master certain skills before they can go home, such as toileting or climbing stairs, or they may require specialized education. For example, education or training for wound care, diabetes, colostomy care, or it can be as simple as education concerning their medications prior to going home. A patient's length of stay typically lasts from a few days to a few weeks, depending upon their condition and how quickly they reach their highest practicable level of functioning to return home to a full and productive life.

Paulina Rademaker can speak from personal experience. "As a nurse practitioner, I have worked in several skilled nursing facilities over the last six years. Facilities like Christopher East Healthcare have transitioned themselves to meet the needs of the patient with very specific clinical needs and goals to be met before going home. Christopher East has raised the bar in the field of skilled nursing and rehabilitation."

"Never before has a sub-acute setting looked and felt so close to an acute (hospital) setting. Everything has changed in our skilled nursing world from the type of staff and caregivers that we recruit and train, to advanced equipment such as CPM machines, wound VAC, bladder scan, defibrillator and of course the medical management by advanced nurse practitioners such as myself, and our physician specialist in rehabilitation medicine."

Patients need to select a program based on the *quality of care* they will receive, instead of décor or location. Choosing a rehabilitation facility ill-equipped for their medical needs or going home without the proper support systems in place can potentially be very harmful to the patient. If not monitored closely by qualified staff, the patient can have poor outcomes, such as an orthopedic patient getting a wound infection causing a delay in healing. A patient's orthopedic surgery is a significant investment in improvement of their quality of life. We know that a good rehabilitation outcome is an important part of that investment.

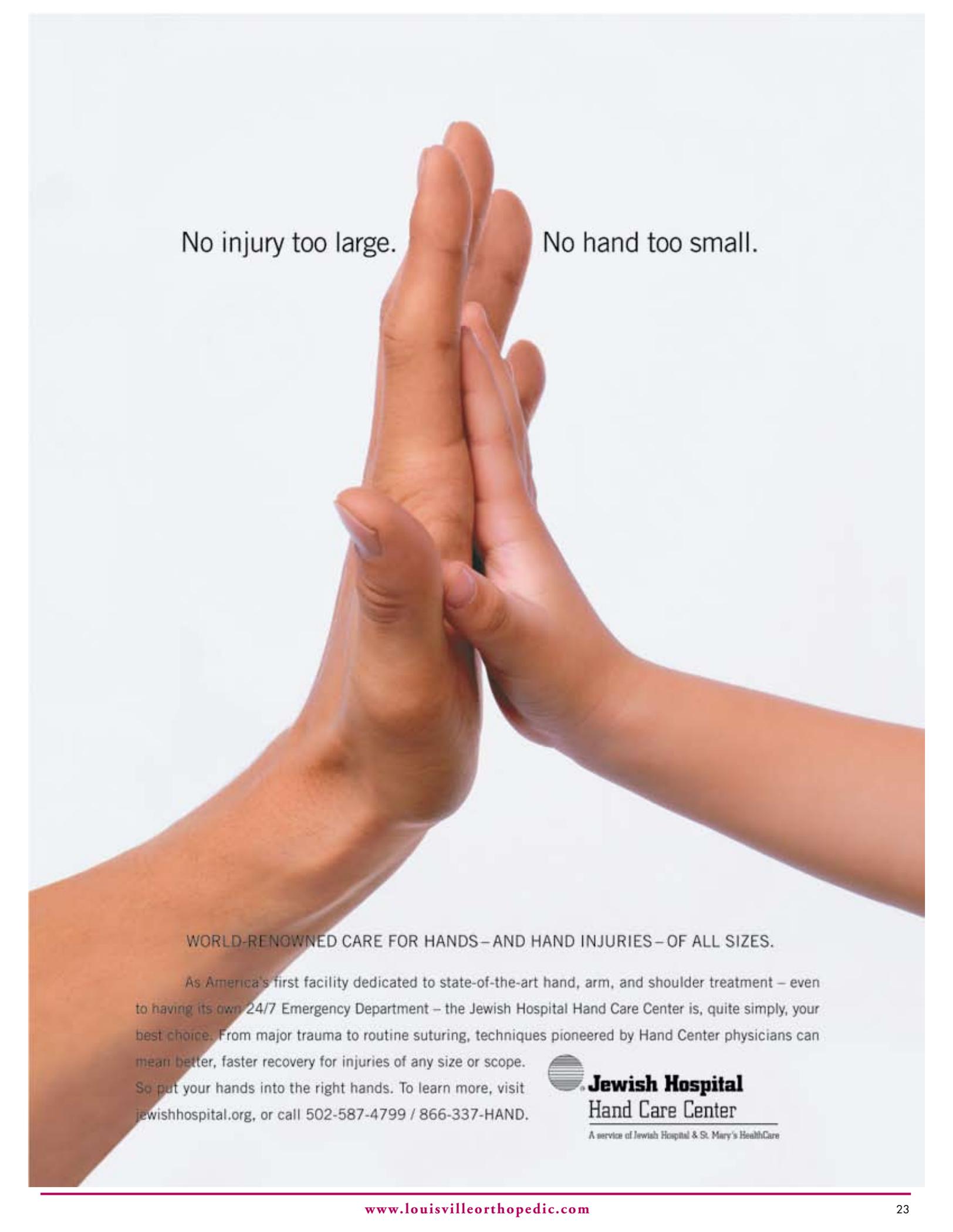
"At Christopher East patients work with therapists in the newly renovated state-of-the art therapy area. The nursing staff provides high quality complex nursing care for patients. The interdisciplinary team works with the patient and their families to ensure that when a patient returns home, they are safe and adequately prepared to care for themselves. Responsible care in a sub-acute setting can help to reduce multiple hospitalizations and the risk of infections or avoid further complications when a patient returns home too quickly."



With the convergence of the baby boom generation on healthcare it is almost certain that sub-acute rehabilitation is truly the wave of the future. Today, as people live longer, fortunately they also can have a better quality of life due to advancements in medical technology and recovery options.

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*Paulina Rademaker, ARNP, is one of the many healthcare professionals dedicated to excellence in sub-acute rehabilitation at Christopher East Health Care.*

A photograph of two hands, one larger and one smaller, being held together in a supportive grip. The hands are positioned vertically, with the larger hand on the left and the smaller hand on the right. The background is a plain, light color.

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# MINIMALLY INVASIVE TOTAL HIP REPLACEMENT Using a Large Head Metal-on-Metal Implant

Hundreds of thousands of people undergo total hip replacement surgery every year. Diseases such as a vascular necrosis, previous trauma and congenital (birth) deformities of the hip are reasons people undergo hip replacement surgery, but the most common diagnosis leading to hip replacement surgery is osteoarthritis.

Osteoarthritis, also known as degenerative arthritis or degenerative joint disease, is the oldest and most common form of arthritis. Osteoarthritis (OA) is a condition that involves the breakdown of joint cartilage. Cartilage is a firm, rubbery material that covers the ends of the moving bones and joints. It acts as both a shock absorber and a lubricant, protecting bones from damage and providing smooth, pain-free movement. The first sign of osteoarthritis of the hip is discomfort and stiffness in the groin, buttock or thigh upon walking in the morning. The pain flares or intensifies when patients are active and then lessens during periods of rest. If left untreated osteoarthritis of the hip will continually worsen until resting no longer relieves the pain. When the cartilage has completely worn out in the hip joint, bone will start to rub against bone, making movement extremely painful. Left untreated, osteoarthritis in the hip may cause a patient to lose the ability to rotate, flex or extend the hip. Inactivity to avoid the pain will cause weakening of the muscles controlling the joint, which may cause an eventual limp.

Typically, we reserve total hip replacement surgery as a last option. Nonsurgical treatment options for osteoarthritis of the hip include resting the hip from overuse, physical therapy for range of motion and strengthening exercises and gentle, regular exercise like swimming, water aerobics or cycling. We will also try medications, including non-steroidal anti-inflammatory medicines (NSAID's), as well as intra-articular hip injections with steroids (most commonly patients think of cortisone injection). Using an assist device such as a cane or walker and weight loss if necessary are important factors in treating hip osteoarthritis.

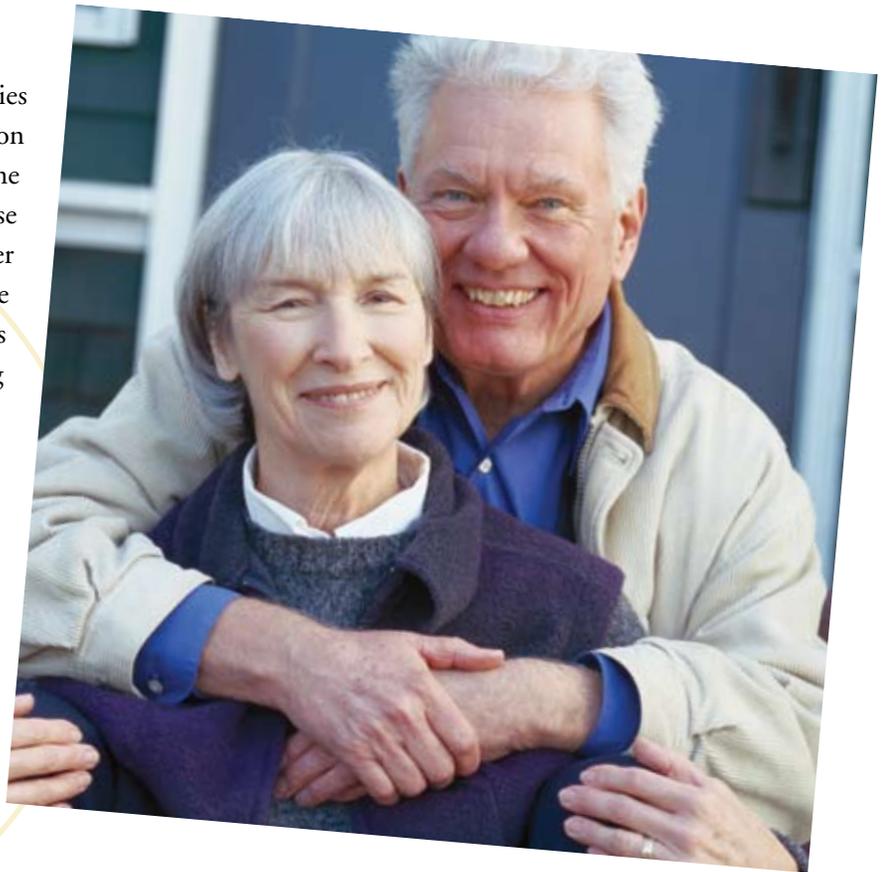
When these conservative measures fail and the pain becomes disabling, the only option is to undergo total hip replacement surgery. The hip joint is a ball-and-socket joint that connects the thigh bone (ball) to the pelvis (socket). We perform a total hip replacement by removing the arthritic ball and placing a metal stem into the femur (thigh bone) and we resurface the socket (pelvis/acetabulum) with a metal shell. The articulation (where the ball and socket meet) can be many different materials, including metal, polyethylene or ceramic. The success of the construct depends on each individual's body growing into the implants themselves. Once the implants are ingrown they are designed to create a new, smoothly functioning joint that prevents painful bone-on-bone contact.

Historically, total hip replacement surgeries only lasted around 10 to 12 years. The reason for this limitation is due to the polyethylene (plastic) acetabular liner. Over the course of the 10 to 12 years the polyethylene liner will deteriorate and potentially need to be replaced. Unfortunately, as the body absorbs the small plastic particles that form during this deterioration process, it will absorb some of the bone surrounding the metal implants. When this absorption reaches a significant level, the acetabular and/or femoral components will become loose and this will result in pain leading to revision or repeat surgery.

Current technology allows us to use various materials at the articular surface between the femoral component (ball) and the acetabular component (socket). In an effort to increase the longevity of the implants we have decreased the use of the polyethylene liner and have chosen to use a large head metal-on-metal implant. These implants feature a metal ball that moves against a metal cup. The metal cup is what provides the additional resistance to deterioration and wear. Metal is much harder than polyethylene, and since the metal resists wear better than polyethylene, the metal-on-metal hip can outlast traditional polyethylene-on-metal hips, which is an important consideration for young patients considering hip replacement surgery.

The most important advantages to the current design of the large head metal-on-metal total hip replacement is that the implants combine increased durability, with increased stability and resistance to dislocation by more closely mimicking a healthy joint's range of motion and stability. Lack of range of motion and stability can lead to impingement and dislocation. The new large head metal-on-metal hip replacement has been designed to provide maximum range of motion before impinging, offering the potential for over 160 degrees range of motion. Larger heads require the head to travel a greater distance before it can "jump" out of the socket, therefore offering greater stability and resistance to dislocation. The large size of the head also allows for better replication of the patient's normal anatomy. With traditional polyethylene-to-metal articulation, the size of the replacement joint is typically smaller than the original joint. The larger head with current designs creates a more "normal" feel to the replaced hip, which leads to a much more satisfactory outcome and a happier patient. The new technology in hip replacement surgery also allows us to consider hip replacement surgery in a much broader range of patients. The benefit in the elderly patients is the increased stability afforded by the large head articulating with the large metal socket. The younger patients will have the benefit of a much more durable and long lasting hip replacement, which can allow them to resume more active lifestyles following hip replacement surgery.

Another important advancement in hip replacement surgery currently is the use of minimally invasive procedures. Total hip replacements in the past have been performed through incisions ranging from 16-20 centimeters (roughly 6-8 inches). Advancements in surgical technique have allowed us to decrease the size of



the incision to the range of 7 to 12 centimeters (3 to 4 inches). By preserving the soft tissue surrounding the hip and decreasing the trauma, patients are able to more quickly resume normal activities. Patients are also able to put full weight on the operative extremity the day of their surgery. They are typically in the hospital for about two to three days and many are walking with a cane within two weeks of their surgery. This rapid mobilization has also decreased many of the complications associated with hip replacement surgery, such as blood clots.

Following full recovery from total hip replacement surgery, many patients will resume extremely active lifestyles. High-impact activities are typically discouraged, but many patient's will return to cycling, hiking or playing golf with little or no pain. The ability to resume a much more normal lifestyle following hip replacement surgery, as well as the ability to recover more quickly coupled with the fact that the implants have increased longevity, all allow patients to realistically consider hip replacement surgery no matter what their age.

## FAQS: LARGE HEAD TOTAL HIP REPLACEMENT

### **1. When is a time to consider hip replacement surgery?**

Total hip replacement surgery should be considered in any patient of any age when pain in the hip joint itself becomes disabling. Ninety percent of patients who undergo total hip replacement surgery have the diagnosis of osteoarthritis. Other common diagnoses include rheumatoid arthritis, avascular necrosis, as well as some congenital hip deformities.

### **2. What is osteoarthritis?**

Osteoarthritis is the disease that involves the breakdown of cartilage. Cartilage is a strong smooth material that caps the articulating, or moving surfaces of the bones in the hip joint. Cartilage allows bone surfaces to glide against each other as you move. When the gliding cartilage breaks down or wears away, the bone grind against each other, which can cause pain and limited joint movement.

### **3. Are there any other treatment options other than total hip replacement?**

Typically, we reserve total hip replacement surgery as the last option. Unfortunately, there is no known cure for osteoarthritis so we attempt to treat the painful hip joint with conservative measures. These conservative measures include non-steroidal anti-inflammatory medicines (NSAIDs), physical therapy for range of motion exercises and strengthening exercises, and intra-articular hip injections with steroids (cortisone).

### **4. What is hip replacement surgery?**

The hip is a ball and socket joint that connects the thigh bone (ball) to the pelvis (socket). When the articulating cartilage between the ball and the socket deteriorates the pain in the joint can become disabling. The only real "fix" for this disabling pain is to replace the ball and the socket. We do this by removing the ball and placing a metal stem into the femur (thigh bone) and attaching a metal or ceramic ball to this stem. We also resurface the socket with a metal shell, which is firmly affixed to the acetabulum, which is part of the pelvis. The implants are designed to create a smoothly functioning joint that prevents painful bone on bone contact.

### **5. How long do current total hip replacements last?**

Historically, total hip arthroplasties which incorporated a metal ball articulating with a polyethylene (plastic) liner would last only 10 to 12 years. The polyethylene liner would unfortunately deteriorate over the course of the 10 to 12 year lifespan and potentially need to be replaced. Unfortunately, as your body absorbs the small plastic particles that form during this deterioration process, it will resorb some of the bone surrounding the metal implants. When the absorption reaches a significant level the acetabular and/or the femoral components would become loose. This would result in pain leading to revision surgery. Current technology allows us to improve the longevity of the implants by using all ceramic or all metal articulations. These “hard” bearing surfaces have the potential to last for many decades since the source of failure, the polyethylene liner, has been removed.

### **6. What are the advantages of large head metal-on-metal hip replacement?**

There are two great advantages to using the large head metal-on-metal total hip replacement systems. By using such a large metal head we can allow for the greatest range of hip motion, which in turn allows the implants to more closely mimic the native hip joint. Secondly, by using such a large metal ball we also can allow for greater stability to the joint, which will hopefully prevent painful dislocations that could require additional surgery. The greater range of motion and stability afforded by these large head metal-on-metal implants allows for a much more normal feel to the replaced hip and this leads to a more satisfactory outcome.

### **7. What should I expect during my hospital stay?**

Patients should expect to remain in the hospital for two to three days following total hip replacement surgery. Using new minimally invasive techniques allow us to preserve soft tissue surrounding the hip, which will allow patients to resume normal activities much more quickly. Physical therapy is started the day of surgery and progresses over the two to three day hospital stay. Intravenous antibiotics are given 30 to 45 minutes prior to the operative procedure and continued for 24 hours after the surgery to help prevent infections. The patients will also be placed on a blood thinners to help prevent the formation of blood clots.

### **8. What can I expect following hospital discharge?**

Patients have two choices following hospital discharge. Since patients are allowed to bear full weight on their operative leg immediately following surgery, rehab can progress quickly. The majority of patients will return to their home and a physical therapist and nurse will visit the home for therapy and evaluation at regular intervals. A smaller group of patients will actually go to an inpatient rehabilitation center where they will stay 24 hours a day until they are mobile enough to return home.

### **9. How long does it take to completely recover from total hip replacement surgery?**

There are many factors involved in how quickly a patient will recover from total hip replacement surgery. Typically patients will walk with a walker or a cane for anywhere from two weeks to six weeks following surgery. At the six-week interval most patients are mobilizing quite well, they just don't have the endurance that they had before surgery. This endurance will improve over the following four to six weeks to the point where most patients are resuming relatively normal activities by three months following surgery.

### **10. What is my activity level long term?**

High-impact activities are typically discouraged, but many patients will return to cycling, hiking or playing golf with little or no pain. The return to a much more active lifestyle has been one of the biggest advantages to the large head metal-on-metal total hip replacement surgery.



# Benefit of the Exercise versus Risk of Injury

As a practicing Physical Therapist (PT) in an outpatient orthopedic clinic, I often educate people on how to initiate or resume an ongoing exercise program after Physical Therapy. Each person is at a different level of fitness from the young athlete through the senior population. I educate individuals on a home exercise program for their specific injury or problem. Most ask questions about how to begin an ongoing more thorough exercise program or how to resume their current program. Some common questions are answered and suggestions are made. The information will aid in enhancing your Home Exercise Program (HEP) from your PT.

This article is written in very basic terms to help individuals get an understanding of how to start or resume a comprehensive exercise program. Often people do not know where to begin, what they should do, or should not be doing. Many do not know who to ask or what to ask. The recommendations in this article will establish some guidelines or tips to help you begin to exercise. This is a guide to get you started and help minimize over training and/or risk of injury. The principle of this program is *“Benefit of the exercise versus Risk of injury”*, a common sense approach to exercise. For example, lifting heavy weight and poor technique increase your risk of injury versus the benefit you would receive from the exercise. We must learn to listen to our body. Remember the often stated “no pain, no gain”. This is not always true. If you are recovering from an injury and have pain with an exercise it is probably causing more harm than good. There is a difference between muscle pain and soreness versus pain that continues, causing injury. The strain you feel should stop when you stop the exercise. If it does not, you are putting yourself at risk for injury. The strengthening exercises you do should closely mimic what you do at work or play. Think about how basketball players look versus a football player. They both lift many weights but their physique is different. Their exercise programs are tailored to what they do and need. Tailor your exercise program to your needs and what your goals are.

It is important to get clearance from your doctor before participating in an extensive exercise program. The HEP will give you a good start in the process of initiating an exercise program with focus on how to further care for your injury or pain.



### Walking/Running Program:

**START SLOW!** Do half of what you think you need or want to do the first time out. This includes running or walking. If walking, go at a normal pace and half the time or distance. See how you feel after and the next day, then add more time or distance. Once you reach your time or distance with no pain or excessive soreness, increase your speed.

When you start a jogging/running program do what is known as circuit or interval training. For example, if you are going to run 20 minutes, walk/run in 5 minute increments respectively. The next time walk 5 minutes and run 8 minutes and progress your way up to the full time running.

A common mistake people make is that they want to walk 2 miles and will walk 1 mile away, then start having pain and have to walk back. Stay close to home or the car. When you start having pain it is time to stop the activity. If you continue, you're increasing your risk of injury. The benefit is little to no gain.

Treadmills are a good way to begin a program. A treadmill is more forgiving

than walking outdoors because of the cushioning built into the deck of the treadmill. The treadmill is also easier, as the floor is moving, taking less energy with your stride. They also offer consistent speed and a flat surface to walk on. As mentioned above, speed is important to remember. The average walking speed for an adult is 1.7 mile per hour.

You do not want to limp on the treadmill. This will cause pain in other areas (back, hip, other leg, etc.). Sometimes walking with a limp is more mental than physical. You get used to walking with a limp and it becomes a habit. A normal walking pattern is basically a heel strike when you step forward and pushing off with your toes when you lift your foot to take the next step. A strategy to help eliminate limping is using a single leg on the treadmill. It will help retrain your gait pattern as well as train the muscles for normal walking. Stand on the side of the treadmill with your uninjured (Good) leg supporting your weight. Start the treadmill at about 1.2 mph. Now begin by stepping forward with your leg and striking your heel (heel strike) on the treadmill with your toes pulled up. Let your foot roll from the heel to flat with the treadmill until you are on your toes then lift your foot (push-off) and repeat. Speed is not

important. Focus on the mechanics and the heel – toe sequence. Apply as much weight as desired and as able. When you can apply all your weight on involved leg without pain or limping, walk on the treadmill with both legs.

The elliptical is also a better choice than running on a treadmill or outdoors. The motion is more fluent with less pounding on joints. It also offers a flat surface and consistent speed for your workout. You will be able to monitor your distance and speed more easily. You can also incline an elliptical if you choose, allowing you to progress into a more aggressive program.

### Stationary Bike Program:

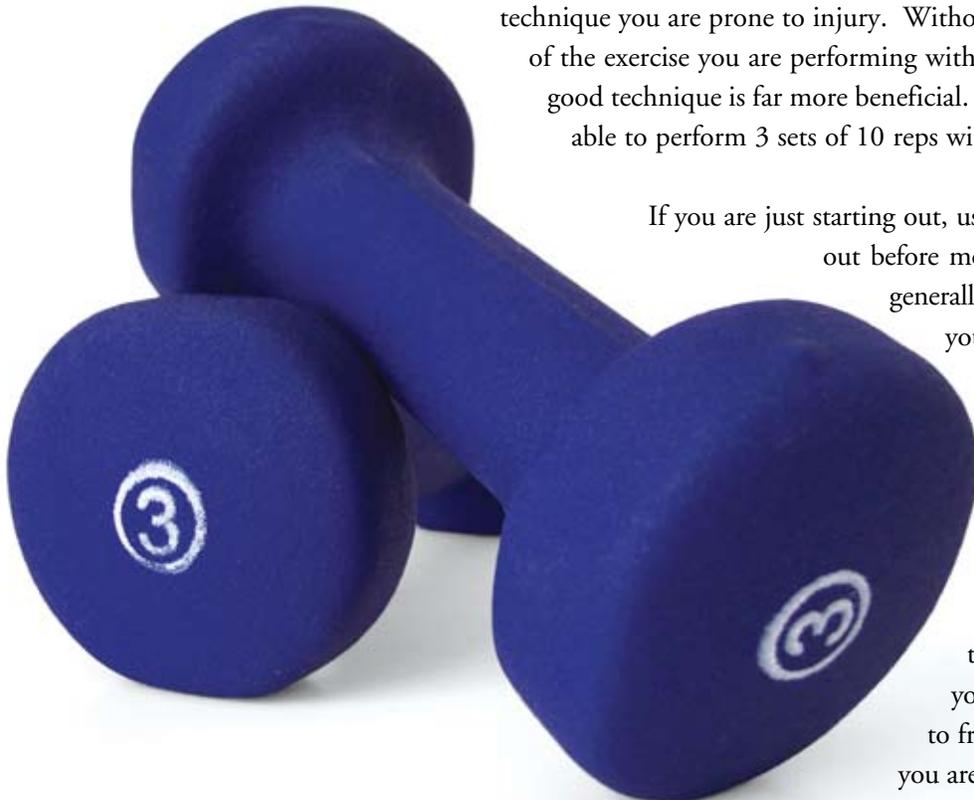
If you start riding a bike, have the seat high enough that your leg is straight as possible while still contacting with the pedal. If you are between seat positions a small bend is okay. This allows you to use less range of motion (ROM) of the knee and is safer for your joints. Generally, not always, the bike is easier on arthritic joints of the lower extremities. The reason is less pounding or percussion on your joints. The motion is more fluent.

Start at a slow pace and ride for 20 to 30 minutes to get the benefit of a cardio workout as well as exercising your leg muscles. You can also increase your heart rate and cardio workout by adding arm motion while riding the bike. Some bikes come with moving handlebars, if not, doing light biceps curls or moving arms without weights is as effective.



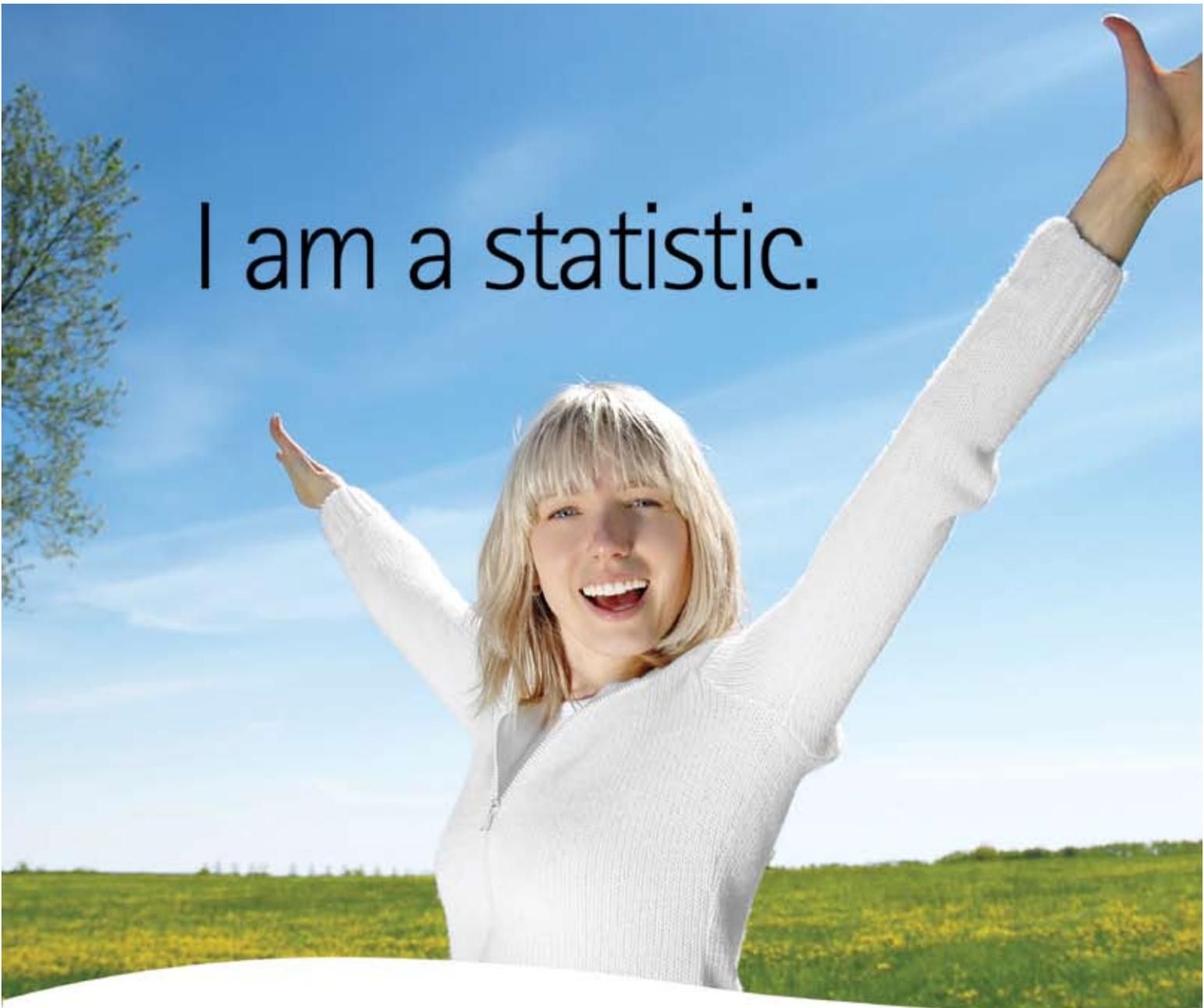
### Strength Training Program:

Good technique is more important than how much weight you lift. If you lose good technique you are prone to injury. Without good technique you lose the benefit of the exercise you are performing with little to no gains. Lighter weight and good technique is far more beneficial. Start with light weight. You should be able to perform 3 sets of 10 reps with weight.



If you are just starting out, use exercise equipment to begin working out before moving to free weights. The equipment generally has a picture of what muscle groups you are working. They also help you with good positioning and technique to help lift properly. **Do not ever hold your breath while lifting weights.** You should exhale during the hardest part of the exercise. Take short rest periods between sets, and a longer rest period between exercises. Hold the weights loosely but firmly. When you are comfortable with these, progress to free weights mimicking the same motion you are doing on the equipment.

*continued on page 38*



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#### ERNEST A. EGGERS, M.D.

Dr. Eggers is one of this area's first physicians to perform total joint replacement surgery. He is considered a foremost expert in the study of joint reconstruction, and his surgical prowess has made his counsel much sought by manufacturers of joint prostheses from all over the U.S.A. His studies have taken him to Germany, Belgium, France and other countries. He has conducted seminars and research on the subject of arthritic joint replacement and continues to strive for innovative ways to reduce arthritic joint pain. He is a member of many local and state societies, including the Society for Arthritic Joint Surgery, The Association of Knee and Hip Society, The Academy of Orthopaedic Surgeons, and he is board certified in orthopaedic surgery.

Dr. Eggers has been involved in minimal invasive hip surgery for over 25 years and is now teaching limited-incision surgery on both hips and knees. Throughout his practice he has performed over 10,000 hip and knee replacements. Metal/metal hip implants have been used in his practice for approximately nine years, and ceramic/ceramic for approximately four years.

Dr. Eggers is a native of Indiana and served in the United States Navy. He completed his internship and residency at the University of Louisville.



#### DONALD T. MCALLISTER, M.D.

Dr. McAllister's love of and participation in sports provided the stimulus that led him to specialize in treating sports-related injuries. His major areas of concentration are the shoulder, hip and knee. His work, therefore, commonly includes arthroscopy, ligament reconstruction and joint replacement. He is a member of the Jefferson County Medical Society, the Kentucky Medical Association and the American Medical Association. He is board certified in orthopaedic surgery by the American Board of Orthopaedic Surgery, and is a member of the American Academy of Orthopaedic Surgeons, American College of Surgeons, American Orthopaedic Society of Sports Medicine and the Arthroscopy Association of North America.

Dr. McAllister was born in Chicago, Illinois, but spent most of his early years in Kentucky. He is a graduate of the University of Notre Dame and the University of Kentucky Medical School. He completed his orthopaedic residency at Yale University in New Haven, Connecticut and a fellowship in Los Angeles.



#### NORMAN V. LEWIS, M.D.

Dr. Lewis specializes in knee injuries, shoulder injuries and minimally invasive disc procedures for spinal injuries. He has performed over 15,000 knee surgeries since 1976. This includes both total knee replacements and arthroscopic procedures. His surgical techniques include the use of lasers. He examines existing and evolving methods of surgery by attending study groups and seminars all over the country.

Dr. Lewis is a Kentucky native and is a graduate of the University of Kentucky Medical School where he earned his medical degree and also completed his residency. He served in the United States Navy after his internship. He is board certified in orthopaedic surgery, and is a member the Kentucky Medical Association, Jefferson County Medical Society and Kentucky Orthopaedic Society, as well as American Medical Association and American Academy of Orthopaedic Surgeons.



#### RICHARD A. SWEET, M.D.

Dr. Sweet specializes in the area of total joint replacement. He completed the Aufrank Reconstruction Fellowship in joint replacement surgery at the New England Baptist Hospital in Boston. He has been involved in both clinical and scientific research in this field, which has included implant and instrument development for hip and knee replacement surgery. These research and development efforts have focused particularly on minimal incision techniques. An avid teacher, he often conducts seminars on the subject of total joint replacement for both medical personnel and the community at large. This includes physician cadaver lab teaching of minimal incision total knee replacement and total hip replacement surgery. He has a special interest in sports medicine and particular expertise in knee reconstructive surgery, and he is the team physician for Ballard High School and Kentucky Country Day.

Dr. Sweet was born in Kentucky and earned his undergraduate and medical degrees at the University of Kentucky. He served his residency at the University of Louisville. He belongs to all the state and local medical societies and is board certified in orthopaedic surgery.



### THOMAS R. LEHMANN, M.D.

Dr. Lehmann is nationally recognized for his research and expertise on diseases of the spine and has received many prestigious awards, including the coveted Volvo Award presented by the International Society for Study of the Lumbar Spine. The acclaimed Acromed Award, presented by the North American Spine Society, was bestowed on him twice. He has published numerous abstracts, chapters in books, and research papers, and has made many presentations relating to the area of the back. He is an associated editor of the journal SPINE.

Dr. Lehmann attended Flaget High School in Louisville and received his B.S. from the University of Notre Dame. He earned his medical degree at the University of Louisville and completed his residency at the University of Texas. He completed a fellowship in spine surgery at Tulane University prior to assuming his reaching responsibilities as a professor at the University of Iowa. He is board certified in orthopaedic surgery.



### GEORGE E. QUILL, JR., M.D.

Dr. Quill is one of the region's first fellowship-trained orthopaedic surgeons sub-specializing in disorders of the foot and ankle. His academic appointments are quite numerous, and many awards and honors have been bestowed on him. His research and writings on the subject of the foot and ankle have been extensive, including seventeen published articles, five book chapters, and Academy-sponsored instructional videotapes and DVD's.

Dr. Quill gives many scientific presentations each year on the subject of foot and ankle disorders, and is a member of the clinical faculty at the University of Louisville School of Medicine. Current interests are in foot and ankle reconstruction, orthopaedic device development, and orthobiologic research.

Dr. Quill was born in Chicago, Illinois. He attended the University of Notre Dame, earned his medical degree at Northwestern University and completed his residency at Chicago's Rush-Presbyterian-St. Luke's Medical Center. His fellowship was completed in Baltimore at Union Memorial Hospital. He is board certified and voluntarily re-certified in orthopaedic surgery.



### SCOTT D. KUIPER, M.D.

Dr. Kuiper specializes in orthopaedic sports medicine and athletic-related injuries. He completed his fellowship training at the American Sports Medicine Institute in Birmingham, Alabama, and has been involved in the care of professional, collegiate and high school athletes. He has published numerous research papers, abstracts, and book chapters, and has made numerous presentations relating to the advancement of arthroscopic surgery in sports medicine. He is also the team physician for St. Xavier High School.

Dr. Kuiper earned his undergraduate degree at DePauw University and attended the University of Louisville School of Medicine. He completed his residency, as well as an Orthopaedic Research Fellowship at the University of California, San Diego. He then completed an Orthopaedic Sports Medicine Fellowship under the direction of Drs. James R. Andrews and William Clancey in Birmingham, Alabama. He is board certified in orthopaedic surgery, and is a member of many national, state and local medical societies.



### TY E. RICHARDSON, M.D.

Dr. Richardson specializes in orthopaedic sports medicine and athletic injuries. He attended Baylor University and earned his medical degree at the University of Texas Medical Branch. He completed his orthopaedic residency at the University of Louisville receiving numerous honors and awards. He has done extensive research and presentations in orthopaedic trauma.

Dr. Richardson attended an Orthopaedic Sports Medicine Fellowship at the Hughston Clinic in Columbus, Georgia. He is board certified in orthopaedic surgery. He is currently the team physician for Manual High School.



### ROBERT A. GOODIN, M.D.

Dr. Goodin is a Louisville native earning his medical degree and completing his orthopaedic residency at the University of Louisville where he received numerous honors and awards. He has done extensive research and presentations in hip and knee techniques. He also attended an Adult Reconstruction Fellowship at Indiana University Medical Center.

Dr. Goodin became board certified by the American Board of Orthopaedic Surgery in July 2004. He is a member of local and state medical and orthopaedic societies, as well as the American Academy of Orthopaedic Surgery.



### LORI L. EDMONDS, ARNP

Lori is a nurse practitioner working in collaboration with George E. Quill, Jr., M.D. specializing in disorders of the foot and ankle. She graduated Magna Cum laude from the University of Louisville with a Master's of Science in Nursing. She also has a Bachelor's degree of Science in Nursing from the University of Louisville in 1997 and received her Master's in 2005.

Lori became board certified by the American Academy of Nurse Practitioners in 2005. She is a member of the American Academy of Nurse Practitioners, The Kentucky Coalition of Nurse Practitioners and Nurse midwives, and a member of Sigma Theta Tau.



### MELISSA D. TAYLOR, MS, PA-C

Melissa is a certified Physician Assistant specializing in orthopaedics under the supervision of Scott D. Kuiper. She was an athletic trainer during her four years at Hanover College and graduated with a Bachelor's degree in Sports Medicine. She worked as research assistant/athletic trainer at Methodist Sports Medicine Clinic in Indianapolis for three years. She then traveled to New Jersey where she attended Seton Hall University and received her Master's degree in Physician Assistant Studies.

Melissa became board certified by the National Commission of Certification of Physician Assistants in 2005 and has been practicing in orthopaedics. She is a member of the American Academy of Physician Assistants and the Kentucky Academy of Physician Assistants.



### KATE S. HAMILTON, PA-C

Kate is a certified Physician Assistant specializing in orthopaedics under the supervision of Richard A Sweet, M.D. She is from Northern Kentucky, graduating from the University of Kentucky with a B.S. in Dietetics, as well as in the Physician Assistant Studies.

Previous to her employment at Louisville Orthopaedic Clinic, she worked in the orthopaedic clinic at Fort Knox, Kentucky for eight years.

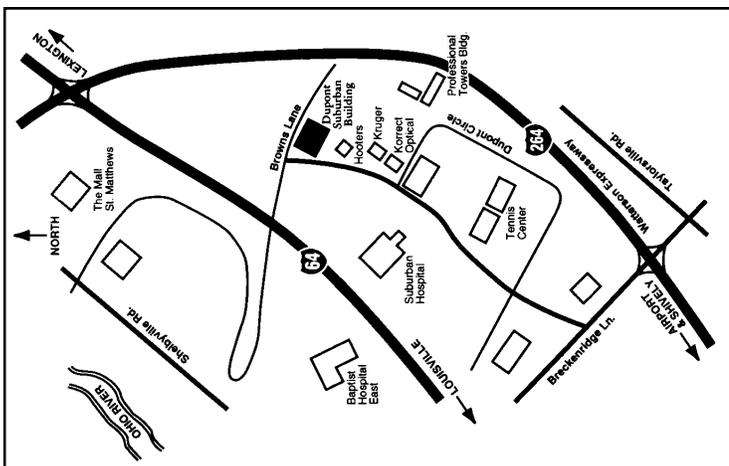
She is a member of the American Academy of Physician Assistants, Kentucky Academy of Physician Assistants, and National Commission on Certification of Physician Assistants.



### CHRISTINA L. FIELDS, ARNP

Christina is a nurse practitioner working in partnership with Norman V. Lewis, M.D. specializing in surgery of the knee. She graduated from the University of Louisville with a Master of Science degree in Nursing in 2002. She also graduated Cum Laude with a Bachelor of Science in Nursing from the University of Kentucky in 1997.

Christina was board certified as a family nurse practitioner by the American Academy of Nurse Practitioners in 2003. She is a member of the American Academy of Nurse Practitioners and the Kentucky Coalition of Nurse Practitioners and Nurse Midwives.



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*continued - "Benefit of Exercise Versus Risk of Injury"*

If you have done weight training before and are resuming after an injury start at 50% of what you did before and progress from there. Start with 3 sets of 10 reps., you will probably feel like you did not do much. That is okay. See how you feel the next day. If you are not sore and pain free add 1 plate (usually 10 pounds) the next time you lift, and do 3 sets of 10 reps. Again if not sore or pain add another plate or 10 pounds the next time and so on. This will allow you to control your progression back into weight training and your muscles to adapt to the lifting. This will also help you from over doing it on the first day. Most people do not feel it when they are lifting the first time. It is generally the day or two after exercise when the soreness begins. Remember this is a long-term process and takes time to develop.

**Helpful Hints:**

1. When doing bench press, keep your elbows close to your torso. Do not drop your elbows below your torso. Use a towel roll on the bar to hit your chest at the point when your elbows are beside your torso so you can focus on lifting weight, and not on where your arms are. If using equipment, you can preset the length of the lift so it will not allow you to go to far.
2. If you have shoulder pain or are prone to shoulder problems, keep arm exercises below shoulder level. The exception to this is lat pull-downs or the chin-up assist machine because the force is pulling down not pushing up. An example of force pushing up is military press or seated press.
3. If you have or had knee pain or an injury in the past, avoid deep knee bending with squats. The leg extension machine can also cause pain because of the force and stress on the kneecap. The leg press is a good alternative to strengthen quads having more support and control during exercise. Please do not lock out knees (legs fully extended) on the leg press. Lunges are also a good alternative for quadriceps strengthening and can be made more difficult by holding dumbbells in your hands.

## Return to Sport:

Returning to sporting activities or dynamic activity requires additional exercises. Most often exercises are performed in straight planes with the body, however, when we play sports we move in diagonal planes and multiple directions at one time. Other things to consider are balance and body awareness in space. You need to do the extra exercises and agility drills to prepare for your return to play.

- Running should begin in straight lines and progress to diagonal running. An example would be on a basketball court. Start at corner of baseline and run to foul line, then to sideline at mid-court, then back to foul line, then baseline corner. Next, progress to lateral movements including side-stepping.
- Balance activities are important for all lower extremity injuries. Start with single leg balance. Do with eyes open and then closed for increased difficulty. You can further increase difficulty by leaning forward or backwards with reaching.
- Jumping can progress from simple bunny hops on single leg to skips with progression to power skips (jumping up with skip motion) and box jumps at multiple levels.
- If returning to golf, start with chipping and putting. If that goes OK, go to the driving range and hit a small bucket of balls. Start with a wedge or 9 iron and progress up through your irons every 5-10 shots, then #3 wood and driver. If that goes well, go up to large bucket and progress through again. Assuming all is well, go play 9 holes. All is not lost if you start having some fatigue or soreness. Most people play with friends or regulars and they know you are on the mend. Let them help you by either playing their drive or have them hit a ball for you and you continue to play the short game. Maybe even only chipping and putting, but you will still be out there on the course and not slowing play. Each time you should progress to more holes, as you get stronger.

Sometimes the hardest part about exercising is getting started. Do not be afraid to ask your doctor or healthcare professional questions or express your concerns about exercise. There are many resources and outlets to educate you on proper exercise. Remember to listen to your body. It is okay to skip a day or two or even a week if you are not feeling well or having problems with pain. An exercise program needs to be part of your daily/weekly routine.





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As with any medical treatment, individual results may vary. Only an orthopaedic surgeon can determine whether an orthopaedic implant is an appropriate course of treatment. There are potential risks and recovery takes time. The life of the new joint depends on weight, activity level, age and other factors. These need to be discussed with your doctor.

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# A HIP REPLACEMENT FOR A LIFETIME: The Cementless Metal-on-Metal Reconstruction

## INTRODUCTION

Total hip replacement surgery (THR) has become a highly successful reconstructive surgical procedure. Many thousands of patients benefit from the procedure annually. Of the commonly replaced joints, the hip is perhaps the one that “feels the most normal”. Though in experienced centers the risk of surgical complications is low, problems do exist. One of the major problems now being addressed is the limited life span of an artificial hip. THR implants historically have failed by one of two mechanisms. These failure modes include 1) implant loosening from the bone and 2) wearing out of the polyethylene (plastic) cup.

## HISTORICAL FAILURE MECHANISM #1: IMPLANT (CEMENT) LOOSENING

In early days of hip replacement surgery all implants were cemented. Cement fixation typically would last 10 to 15 years (less in a younger more active patient). Implant fixation failure would then gradually occur as the cement began to crack and loosen. Over time the problem of cement loosening has largely been eliminated by the development of cementless implants. Cementless implant fixation has now become safe and effective for use in most hips thus largely eliminating the problem of late implant loosening. In certain clinical situations such as in the very elderly or in patients with extreme osteoporosis cementing may still be the optimal fixation option.

## HISTORICAL FAILURE MECHANISM #2: POLYETHYLENE WEAR

Historically the artificial hip has consisted of a cobalt-chrome metal ball (titanium is not used as it scratches when used as an articulating surface) articulating with a high density polyethylene (plastic) socket. The problem with this metal on plastic articulation has been that the metal ball is harder than the plastic socket causing the plastic to gradually “wear away”. The result is that small plastic wear particles are released into the joint. Often these plastic particles set up an inflammatory reaction causing cysts to develop in the bone and contribute to loosening of the implants. This cascade of events typically would occur over 10 to 15 years but were observed to occur at an accelerated pace and over a shorter time period in younger more active patients. Thus the search was on to eliminate the plastic and develop a new more wear resistant articulating surface.

### THREE NEW ALTERNATIVE BEARING OPTIONS

Recently advances have produced three new alternatives to the conventional metal ball on plastic cup articulation. These include 1) a new “cross-linked” plastic that is more resistant to wear 2) the use of a ceramic on ceramic ball and socket articulation 3) the use of a highly polished metal on metal ball and socket articulation. Each of these alternatives has certain advantages and disadvantages.



**Figure 1. Metal on polyethylene articular bearing surface. It consists of a metal ball articulating with the polyethylene (plastic) cup which itself is fixed into a metal shell.**

#### OPTION 1: CROSSLINKED POLYETHYLENE - THE NEW PLASTIC

Recent research has demonstrated that by chemically altering the polyethylene “plastic” liner of the cup it can be made stronger so as to better resist the typical wear patterns to which it is exposed. The most common method of achieving this change is to expose the poly to a low dose of radiation. The irradiation of the plastic increases the bonding, called cross-linking, between polyethylene molecules. Data thus far confirms that this new “cross-linked” poly wears much more slowly than that of previous generations. Other chemical means of cross-linking the polyethylene are also being investigated. One promising technique involves treating the poly with vitamin E which can chemically produce cross-linked polyethylene that appears to wear very slowly.

Advantages of the new cross-linked polyethylene include its relatively low cost (little more than conventional polyethylene), ease in manufacturing, and surgeon familiarity with successfully using the design.

Disadvantages include the fact that there is no long term data yet available confirming the theoretical increased longevity of this new form of polyethylene. Cross-linking is a relatively new technology that thus far has only been proved in the laboratory setting (clinical studies are currently underway and results thus far are encouraging). And, though wear theoretically is diminished by the use of cross-linked poly, it is not eliminated. Wear and polyethylene particle debris generation still does occur, just at a slower rate.

#### OPTION 2: CERAMIC ON CERAMIC BEARING SURFACE

In an effort to eliminate the wear problems of polyethylene entirely, research has been directed at the use of other alternatives. One of these has been in the use of ceramics. Ceramics have been utilized in hip replacement surgery for decades in Europe. Early implants failed not because of the use of ceramic in their composition, but instead due to poor implant design. Research has now produced improved ceramic on ceramic hip replacement designs that have just recently been approved by the FDA for use in this country.

Ceramic's prime advantage includes its minimal wear characteristics and the human body's excellent tolerance and low reactivity to it. In other words, ceramics do not wear appreciably and the human body tolerates them well.

Disadvantages exist, however. Ceramics are a form of glass and are somewhat brittle. If improperly designed, manufactured, or handled there is risk of the ceramic implant breaking. There is theoretic concern that as years pass, fracture of the ceramic implant might become an increasingly common problem. Revising a fractured ceramic implant is difficult due to the presence of many tiny "glass" fragments. And ceramic failures cannot be revised to another ceramic implant. Any revision requires a return to a metal on poly articulation.

A second major disadvantage in the use of ceramics is that due to current implant design constraints concerning femoral head size and socket depth, ceramic hip replacements will not be as stable as other alternatives. Thus there will a greater risk of hip dislocation after surgery. This is a significant drawback to the routine use of a ceramic on ceramic hip implant.

### OPTION 3: METAL ON METAL BEARING SURFACE

Another alternative to the traditional metal on polyethylene articular bearing surface is that of the metal on metal hip. This construct entails use of a highly polished metal ball articulating with a similarly polished metal socket. As previously noted, cobalt-chrome is the metal alloy utilized as titanium is not sufficiently scratch resistant. As with ceramics, the metal on metal design has been in use for decades in Europe. And as



**Figure 2. Ceramic on ceramic articular bearing surface. The ceramic femoral head articulates with the ceramic liner of the cup. The ceramic cup liner fits tightly into the metal shell of the cup.**

with ceramics, early failures were related to poor implant designs and not to the metal on metal bearing surface. Similar to the status of ceramic implants, the FDA has only recently released new improved metal on metal designs for implantation in this country.

Advantages of the metal on metal articulation over the other alternatives are several. Most importantly is the fact that almost no wear occurs. Of all alternatives, metal on metal is clearly the most durable. The issue of potential implant fracture that is of concern with the use of ceramics is non-existent with the use of metal on metal implant designs.

Secondly, there are fewer design constraints with metal on metal hips as opposed to that found with ceramics designs. As a result, in metal on metal designs the femoral head (ball) can be made much larger and the socket thinner than with ceramics. The importance of the issue of head size is in its relationship to hip stability. The larger the diameter of the femoral head the more stable the hip and the less the risk of hip dislocation. Thus because of the larger femoral head size of the metal on metal designs

(potentially almost twice as large as with ceramic implants) the THR can be made much more stable with less risk of dislocation.

The major disadvantage in the use of metal on metal hip articulations is the generation of metal ions that occur due to the friction of the metal head rotating in the metal socket. These metal ions are picked up by the hip's blood supply and carried throughout the body by the red blood cells. The ions are then excreted via the kidneys. Epidemiologic studies have looked exhaustively at several decades of data from European patients who have undergone metal on metal hip replacements and at newer data generated in clinical tests performed in this country over the last several years. No adverse health affects due to the presence of the circulating metal ions has been discovered. The risk of several specific health issues were examined in depth and not found to occur at any increased frequency. This included no statistical increased risk of any type of cancer (including leukemia, lymphoma and other cancers of the blood cell producing bone marrow) or kidney damage. Nor was any increased risk of neurologic disorders such as Alzheimer's discovered. At this point there has been no data to suggest that patients with a metal on metal hip articulation are at any increased risk of these or any other health conditions. Thus the FDA has determined that metal on metal hip designs are safe and have approved them for use.



**Figure 3. Metal on metal articular bearing surface. Note that the large femoral head is nearly as great in diameter as that of the normal bony hip. This large diameter increases hip stability reducing the risk of dislocation. A typical ceramic head is just over half this size.**

## **CONCLUSION: WHAT IS THE BEST HIP REPLACEMENT**

### **CURRENT ALTERNATIVES**

At this time there is no universal consensus among experts as to the best articular bearing surface for routine use. The four alternatives of 1) conventional metal ball on polyethylene cup articulation 2) metal head on the new cross-linked polyethylene cup 3) ceramic on ceramic articulation and 4) metal on metal each have drawbacks. With conventional polyethylene, wear over time is a certainty. With new cross-linked polyethylene wear appears to be slowed, but still present. In addition cross-linked polyethylene is new to clinical use and the apparent advantages over the previous polyethylene generation have yet to be clinically proved. Ceramics, while exhibiting almost no wear and being very well tolerated by the human body, are brittle and there is concern regarding the theoretical risk of implant fracture. In addition due to implant design constraints there is a greater risk of hip dislocation with use of ceramic on ceramic implants. Metal on metal articulations appear to solve the problems of the above alternatives. However the metal ions that are generated by these implants have created concerns regarding the potential for the development of secondary health problems. Despite extensive research no associated adverse health affects have been discovered to date due to the presence of these metal ions.

Trying to sort out for the individual patient which alternative is best is difficult. For patients over 70 to 75 years of age perhaps the safest alternative is the use of a metal on conventional polyethylene bearing surface due to its long successful track record. Slightly younger patients nearer the 65 year old age range may be candidates for use of the new cross-linked poly. Healthy patients under 65 years of age and most patients under the age of 60 may be candidates for metal on metal systems.

Patients nearer the 65 year old age range may be candidates for use of the new cross-linked poly.



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#### THE FUTURE OF HIP REPLACEMENT BEARING SURFACES

Clearly the “perfect” hip has yet to be developed. Research is ongoing into newer still alternatives. Some work is being done on a ceramic femoral head articulation with an all metal cup. Problems of joint stability might remain a problem with these implants. And the risk of ceramic fracture also would still be present. Another avenue of research is examining the potential use of a diamond on diamond bearing surface which could possibly solve all of the various problems of current bearing surface alternatives. As the medical economic situation tightens this alternative may well be cost prohibitive. Suffice it to say that with the baby boom generation aging and the need for hip replacement surgery increasing, social and economic forces will continue to drive research efforts to improve the implant bearing surface into an ever more durable construct. And in the upcoming years if further follow up reveals that metal on metal bearing hip replacements are indeed as safe as is currently believed and the metal ions are a non issue as is suggested by current data, we may already have “the hip replacement for a lifetime”.

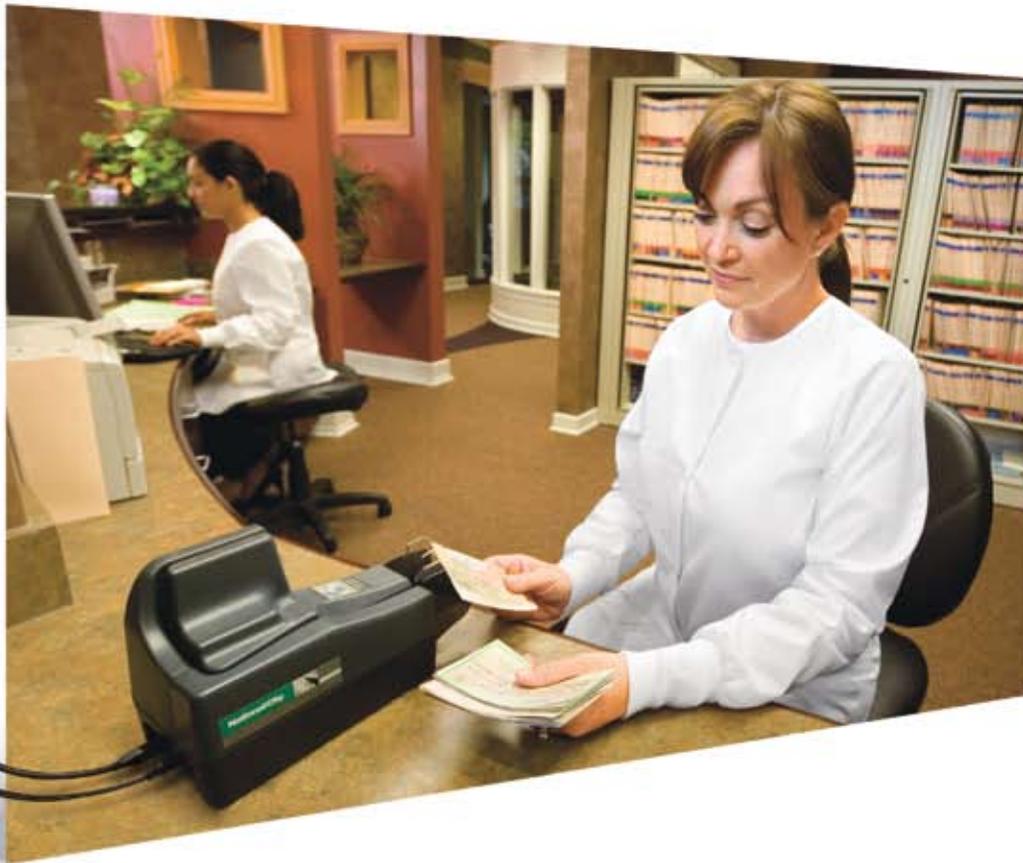


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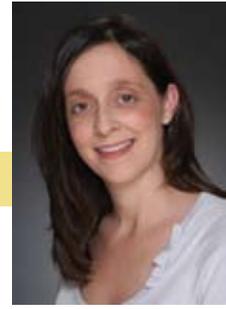
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# Common Conditions of the Foot and Ankle

## Plantar Fasciitis

Plantar fasciitis is inflammation of the sole of the foot. Located just under the skin is a layer of tough tissue called fascia. The fascia in the arch of the foot is exposed to all of the wear and tear the foot experiences. It often starts very gradually, with mild pain that may be felt along the inside of the heel bone and in the arch of the foot. Pain from the inflamed fascia is often felt with the first few steps in the morning, after sitting for a period of time, or after (rather than during) exercising. Sometimes when the plantar fasciitis becomes a chronic condition, a calcium deposit in the area where the plantar fascia is attached to the heel bone may form (often referred to as a heel spur).

Plantar fasciitis rarely requires surgery. For nearly 95% of patients with plantar fasciitis, pain is relieved with exercise and stretching.

### Treatment

First your healthcare provider must rule out other conditions that may be causing your pain. Once the diagnosis of plantar fasciitis has been made, the course of treatment usually requires rest in the initial phase to decrease the inflammation. Stretching for 10 minutes 3 or 4 times a day may bring relief of your symptoms. Sometimes, your doctor may order a non-steroidal anti-inflammatory medication. When pain persists an orthotic (shoe inserts used for support) may help improve your pain.

We suggest you to perform the following exercises at least 3 or 4 times each day:

- **Plantar fascia stretch:** With your shoes on, stand with the ball of the foot on the stair. Reach for the stair below with your heel until a stretch is felt in the arch of your foot and calf. Hold for 1 minute. Repeat 3 times.
- **Towel Stretch:** Loop the towel around the ball of the foot and pull the foot toward your body and hold for at least 30 seconds. Repeat at least 3 times.
- **Standing Calf Stretch:** Facing the wall, place your hands at eye level on the wall. Keep the injured leg back and lean towards the wall until a stretch is felt in the back of the calf. Hold for 1 minute and repeat 3 times.

### Strained plantar fasciitis

#### Remember:

- Stretch before and just after getting out of bed each morning.
- Stretch before and after any exercise.
- Stretch at least 3 or 4 times EVERYDAY.
- Avoid going barefoot.



## Hallux Rigidus



Hallux rigidus is a “stiff big toe joint”. Patients with this condition, which is a form of arthritis, often report that it feels as if they have to force their big toe to bend at the joint when “toeing off” from the ground while walking. Often times, hallux rigidus results in the joint becoming completely rigid. Movement of the big toe joint occurs typically in an up and down plane only. The upward motion is dorsiflexion and the downward motion is plantar flexion. The normal upward movement is approximately 70 degrees and the downward movement is about 25 degrees. You need at least 60 degrees of upward movement of the big toe joint to prevent limping.

### How Hallux Rigidus Occurs

The cause of hallux rigidus is wear and tear on the joint (gout, trauma, rheumatoid arthritis, etc.). The ultra-smooth, thin hyaline cartilage that covers the ends of the bones in joints starts to wear out.

In a normal joint, hyaline cartilage is naturally lubricated by fluids from joint lining called synovium. The lubricated cartilage allows the joint to move smoothly and painlessly. When the hyaline cartilage wears out, joint lubrication is disrupted. This speeds up the degeneration. Joint space narrows and the ends of bones in the joints become exposed.

### Treatment

Treatment of hallux rigidus often has to be surgical, but the joint can be made more comfortable with an appropriate shoe modification. To treat the pain in the big toe joint, the shoes are modified by stiffening the sole, inserting a stiff orthotic arch support in the shoe and sometimes adding a small rocker which is glued on to the bottom of the sole of the shoe.

Thin-soled shoes and high heels aggravate this condition because more stress is placed on the joint, increasing pain. Hallux rigidus can often become simply too painful to live with and may require surgical intervention. There are now several types of surgery and refined techniques that can alleviate stiff big toe joint symptoms.

The decision regarding the most appropriate surgical approach will be based on your orthopedic surgeon's examination of the foot and x-rays. The surgical treatment for hallux rigidus is determined by the extent of the arthritis and deformity. Generally hallux rigidus surgery is performed to help the big toe resume its upward movement. Sometimes the arthritis is so severe that you may require a fusion of the big toe joint to stop painful motion of the big toe joint.

#### Remember:

- Thin-soled shoes and high heels aggravate this condition.
- Mild inflammation and “turf toe” may improve with non-surgical treatment.
- Surgery is recommended for daily pain or stiffness that is intolerable.

## Bunions



A bunion is an enlargement and malalignment of the joint at the base of the big toe. The joint where the bunion occurs is the first metatarsophalangeal joint (MTP joint). When bunions develop and change the way the joint flexes, this not only alters the way we walk, but also affects the way the body's weight is distributed on the feet. That change in the way weight is carried by the body may contribute to the painfulness of bunions.

There appears to be an inherited tendency to have bunions. They tend to be more common among women than men, and loose ligaments or rheumatoid arthritis can increase the chance of having them. Shoes that are short, tight, sharply pointed or extremely high-heeled may seriously aggravate any bunion tendency.

### How Bunions Develop

Bunions cause problems with foot appearance and shoe wear. They are also painful. When a bunion is beginning to develop, the base of the big toe starts to become enlarged and protrude. The big toe itself begins to point toward the second toe and the bones supporting the toes spread apart increasing the width of the foot. In advanced cases, the second toe may rest over the big toe. Unless shoes are fitted for extra width, pain will result from rubbing on the enlarged base of the toe or from bursitis, which may develop due to inflammation and pressure over the joint.

As bunions get larger, greater deformity in the affected joint can cause increasing pain and arthritis. With advancing deformity, normal foot mechanics are altered. This change in weight distribution often causes numbness and tingling, as well as intense pain in the fatty pad behind the toes, and may also cause skin there to harden and thicken.

### Treatment

Wider shoes with broad toes and soft soles often provide considerable relief from bunion pain. Making sure there is no pressure on the ball of the foot can help avoid flare-ups of bursitis. However, many women can not wear the type of shoe required to relieve bunion pain in their places of work. Bunions can often become simply too painful to live with and may require surgical intervention. There are now several types of surgery and refined techniques that can alleviate bunion symptoms.

The decision regarding the most appropriate surgical approach will be based on your orthopedic surgeon's examination of the foot and x-rays. The degree of correction that can be achieved varies. Generally bunion surgery involves realigning bone and soft tissue so that the big toe can resume its normal position. Almost all bunion surgery can be done on an outpatient basis, with no hospitalization.

#### Remember:

Bunion surgery is for patients:

- Who are experiencing daily pain.
- For patients who have noticed the size and shape of their bunion continues to get larger.
- For patients that can no longer find shoes to fit due to the size of their bunion.
- For patients with angulation and deformity of the toes.

## Ankle Sprains

A sprained ankle is a common injury that can happen when you take part in sports and physical activities. It can also happen when you simply step on an uneven surface, or step down at an angle. The ligaments of the ankle hold the ankle bone and joints in position. They protect the ankle joint from abnormal movements-especially twisting, turning, and rolling of the foot. A ligament is an elastic structure. Ligaments usually stretch within their limits, and then go back to their normal position. When a ligament is stretched beyond its normal range, a sprain occurs. A severe sprain causes actual tearing of the elastic fibers. Your ankle sprain may range from a slight stretching and some damage to the fibers of the ligament to a complete tear of the ligament. Significant sprains may mask related ankle injuries and may lead to long term instability, disability, and arthritis.



### Classification of Ankle Sprains

Grade 1 Sprain - Stretching out of the ligaments.

Grade II Sprain - Tearing of some of the ligament fibers.

Grade III Sprain - Complete tear of the ligament.

### Treatment

Once the diagnosis of ankle sprain has been made, the course of treatment usually requires a period of protection in order to heal. Your healthcare provider may suggest crutches for walking or to keep wait off of your ankle. Depending upon the type of injury you may require a cast, cast boot, or a removable air splint.

**Grade I Sprain:** (R.I.C.E.= rest, ice, compression, and elevation). Rest your ankle by not walking on it. Ice should be applied 20 to 30 minutes 3 or 4 times daily. Compression dressing such as bandages or ace-wrap immobilization and support of the injured ankle. Elevate your ankle above your heart level for 48 hours.

**Grade II Sprain:** The R.I.C.E. guidelines can also be used. You may require a device to immobilize or splint the ankle.

**Grade III Sprain:** This type of sprain can be associated with permanent instability. Surgery is rarely needed, but may be required to repair torn ligaments. A short leg cast or a cast-brace may be used for several weeks.

### Rehabilitation

The goal of rehabilitation is to assist you in returning to your daily activities. Our goal is for each patient to regain full range of motion (the ability to move your foot and ankle as well as you did before your injury), full strength, and to alleviate pain.

#### Remember:

- Rest your ankle by not walking on it.
- Ice should be applied 20 to 30 minutes 3 or 4 times daily
- Compression dressing such as bandages or ace-wrap immobilization and support of the injured ankle.
- Elevate your ankle above your heart level for 48 hours.



# RAPID RECOVERY:

## Timeline After Minimally Invasive Joint Replacement Surgery

**Introduction:** The advances of minimally invasive surgical techniques along with those in pain management techniques have provided a recovery timeline after total joint replacement surgery that is dramatically improved over the past experience.

**Pain Management:** With new pain management techniques the patient now is much more comfortable in the immediate postoperative period for the knee. These new techniques include nerve blocks that numb the leg for up to 24 hours or more. Both the femoral nerve (in the front of the hip) and the sciatic nerve (in the back of the hip) are blocked with a long acting local anesthetic. The patient typically is taken from preop admission area to the holding room where the anesthesiologist will first sedate the patient to minimize any discomfort then block the femoral and sciatic nerves approximately 30 minutes prior to surgery.

Other important pain management techniques include the routine administration of both intravenous and oral pain suppressive agents, an icing device to minimize swelling, and “on call” narcotics that can be given either intramuscularly, intravenously or orally.

### KNEE

**Surgical Technique:** With minimally invasive surgery there is less dissection and cutting of the muscles and ligaments of the knee. What the patient observes is that the skin incision is shorter, the quadriceps muscle function returns more quickly, range of motion is regained more rapidly, that the hospital stay is shorter, and that ambulatory aids (cane, walker or crutches) can be discarded sooner. The operation itself usually takes 90 minutes to complete.

**In Hospital Physical Therapy:** Early efforts at mobilizing the patient are made on the day of surgery. Usually a Continuous Passive Motion machine (CPM machine) is applied to the operative leg to start early range of motion. Typically the patient is helped up to a chair that evening as well.

On the day after surgery, therapy starts in earnest. Full weight bearing is allowed from the start. Range of motion and strengthening exercises are started. Ambulation is encouraged. On the second day after surgery stair climbing is taught.

### HIP

**Surgical Technique:** With minimally invasive surgery there is less dissection and cutting of the muscles and ligaments of the hip. The patient observes that the skin incision is shorter, muscle function returns more quickly, that the hospital stay is shorter, and that ambulatory aids (cane, walker or crutches) can be discarded sooner. The operation itself usually takes 90 minutes to complete.

**In Hospital Physical Therapy:** Early efforts at mobilizing the patient are made on the day of surgery. Typically the patient is helped up in a chair and walking that day. On the day after surgery, therapy starts in earnest. Full weight bearing is encouraged. Strengthening exercises are started. Stair climbing is taught.

**Hospital Stay:** The hospital stay is generally two to three days (i.e. Monday surgery would equate to a Wednesday or Thursday discharge). Younger and physically fit patients may be discharged home on the second postop day. Older patients, those less fit, or those planning a discharge to a rehabilitation facility will typically stay three nights

# KNEE

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**Showering Postoperatively:** It is safe to get the wound wet on the 5th day postop if all drainage had ceased. If any drainage persists, the wound should be kept clean and dry with a sterile gauze dressing applied and changed as necessary till it completely stops.

**Physical Therapy after Hospital Discharge:** Three options are available for post hospital therapy.

1. Rehab facility transfer – Direct transfer from the hospital to a rehab facility is sometimes necessary. This option is most appropriate for older patients and for those who live alone. Insurance coverage for rehab stay varies and needs be investigated in advance. Duration of rehab stay can be as short a few days or as long as several weeks and depends on the speed of recovery and the amount of support each patient will have when returning home.
2. Home therapy – This is now the most commonly employed option. Most patients have insurance coverage for home therapy. The quality of home therapy is quite excellent. Duration varies, but is generally employed for two to three weeks.
3. Outpatient therapy - Outpatient therapy in a physical therapy department has the advantage of better equipment vs. what is available in home. More mobile patients often opt for outpatient care. Patients often migrate from home to outpatient therapy as they become more mobile.

**Time on Walker or Crutches:** Full weight bearing is generally allowed immediately after surgery. Most patients can wean off the walker or crutches as their muscle function, swelling and soreness allows. Many patients have moved to the use of a cane by 10 to 14 days postop.

**Time on a Cane:** Once off the walker or crutches, the use of a cane in the opposite hand is helpful (to prevent an excessive limp) for another week or two. Most physically fit patients are off all ambulatory aids including a cane by three weeks postop.

**Returning to Work:** Predicting a return to work date is difficult. Motivational issues play an important role. Great variability exists. In general, patients returning to a sedentary job tend to return to work six weeks postop and those with more physically demanding jobs tend to return at three to four months postop.

**Returning to Recreational Athletics:** Patients can begin to return to light recreational sports such as golf by four to six weeks postop. More strenuous sports such as tennis may require 12 to 16 weeks before a return is possible.

# HIP

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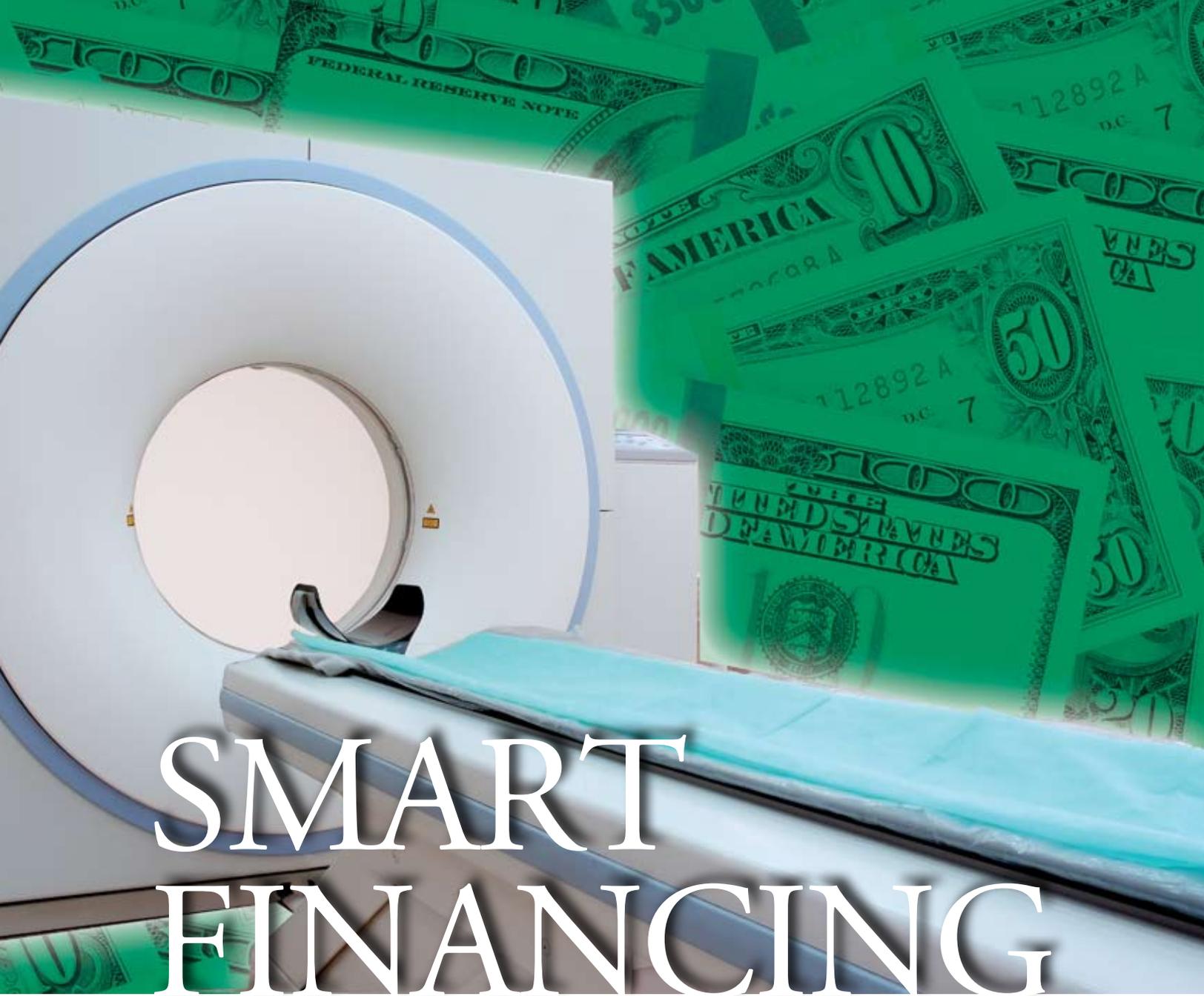
**Time on Walker or Crutches:** Full weight bearing is generally allowed immediately after surgery. Most patients can wean off the walker or crutches as their muscle function, swelling and soreness allows. Many patients have moved to the use of a cane by 1 to 2 weeks postop.

**Time on a Cane:** Once off the walker or crutches, the use of a cane in the opposite hand is sometimes helpful for a short time. Most physically fit patients are off all ambulatory aids including a cane by 2 to 3 weeks postop.

**Time Until Return to Driving:** Patients should not return to driving until cleared to do so postop. In part this is due to liability issues if an accident should occur. It is generally safe to return to driving 2 to 4 weeks after left hip surgery and 4 to 6 weeks after right hip surgery.

**Returning to Work:** Predicting a return to work date is difficult. Motivational issues play an important role. Great variability exists. In general, patients returning to a sedentary job tend to return to work 4 to 6 weeks postop and those with more physically demanding jobs tend to return at 3 months postop.

**Returning to Recreational Athletics:** Patients can begin to return to light recreational sports such as golf by 4 to 6 weeks postop. More strenuous sports such as tennis may require 12 to 16 weeks before a return is possible.



# SMART FINANCING

## Eases the Transition to a New Technology

By P. Mitch Kendall  
Equipment Finance Specialist  
Chase

Acquiring a new piece of equipment can be an arduous task, fraught with potential problems. Since most practices may only need to purchase equipment once every year or two, many times they don't acquire the equipment needed in the most efficient manner. Most physicians have at least one horror story about an equipment purchase gone bad. How does this happen? A number of factors can lead to a poorly executed equipment acquisition.

A mistake many practices make when shopping for a new piece of equipment is neglecting to get multiple proposals on financing. Most practices do a great job of researching the different manufacturers and vendors of an MRI, or X-ray Machine. But, after they decide which machine they are going to purchase, financing is an afterthought. The customer many times will finance the equipment with the vendor's financing program, or he will utilize a traditional bank loan from his bank. Most of the time, the deciding factor in this scenario is convenience, and very little thought is given to things such as cash flow, obsolescence, conservation of working capital or the tax implications of a certain financing structure.

Although there is a time and place for each of these options, and in certain situations one or the other might be the right choice, in many cases little or no thought is given to the financing portion of the equipment acquisition. For example, if a practice is able to get a rate that is 50 basis points lower, let's say 8.00% instead of 8.50%, on a \$500,000 loan with a 60-month term that practice will save over \$7,200 dollars during the life of the loan! That is definitely worth a few minutes on the phone.

With this in mind, it is always a good idea to compare the rates and terms of the vendor's financing program with those of another financial institution that you know and trust. Your bank should be looking out for your interest first, and should offer you a rate that is fair and competitive. Spend some time on the financing portion of the equipment acquisition; a few inquiries could yield big savings.

Vendor financing programs are usually done through a third party. Equipment buyers should be aware of the fact that most third party financing companies are looking out for the vendor's interest first. A good-sized vendor can bring tens of millions of dollars in financing opportunities to a third party financing company each year. Whereas, the average sized company will probably only buy equipment once every year or two. It's not hard to guess who the third party financing company is going to lean toward if there is a difference of opinion on terms and conditions or something much more costly like problems with installation and set-up.

Managing obsolescence is key when dealing with the high-tech, ever-changing field of medicine. It is great to purchase the latest and greatest machine on the market; it gives medical practices better, more accurate data and is a competitive edge in attracting new clients. The challenge that comes along with this is that it won't be state of the art for very long. No one wants to have payments left on a machine that is out of date. A specialist, who knows the industry and the equipment you are purchasing, can advise you on how to structure the financing transaction. He can help you determine how long of a term is too long. Your bank should have a specialist in your area that can offer advise on the financing structure of an equipment acquisition.

Coming up with the capital for a down payment is another challenge facing many practices looking to acquire equipment. This is especially difficult for practices that are young and/or rapidly growing. It's true what they say, "Cash is King". If a practice can acquire equipment without depleting cash reserves; it will be much better off than the practice acquiring the same equipment, but unable to conserve capital.

Most banks are accustomed to doing loans with an 80% loan to value ratio, this means that if a practice wants to finance \$500,000 for a piece of equipment, they must make a \$100,000 down payment. A bank should understand this and offer products and programs to help cash challenged practices acquire the equipment they need to be competitive. Some programs allow a practice to finance 100% of the cost of a piece of equipment and even allocate money to finance things like delivery, installation and sales tax. This can be a huge boost to a company's cash position. Continuing with the example above, if a practice has to pay "soft costs" like

delivery, installation and sales tax, in addition to a 20% down payment, the total cash outlay could easily break the \$150,000 mark. Taking advantage of such programs allows a practice to conserve its capital making it free to invest in other, more profitable, parts of the practice.

Many practices assume that a straight amortization with equal payments every month is their only option. This is not the case at all. A financing institution that truly understands your business should attempt to align the financing payments with the revenue streams that the asset will be producing. For example, if cash flow is seasonal and there are a few months of the year when business is historically slow, ask the financing institution you are working with if they can lower or even eliminate the payments during those months of the year. This should ease the practices “cash crunch” during those months and hopefully eliminate some of those sleepless nights.

Flexible amortizations also have an impact on highly specialized equipment. It usually takes a company two or three months before they can operate a new high-tech machine at full capacity. It makes little sense to make the full payment during those first few months while a physician and his staff is learning how to operate a new MRI or CT Scanner. During this time, fewer scans result in less revenue. A smart practice will request to skip a few payments or utilize a graduated payment plan, known as step-up payments. With skip payments, the payments are skipped while interest accrues. Step-up payments are usually much smaller than the normal monthly payment for the first few months of the term. The payments will then increase steadily every few months until the full payment is reached. A graduated payment structure will cover interest and maybe even some principal while a practice goes through the learning curve associated with new equipment. This will ease a practice’s transition to a new technology, while allowing 60-180 days before the first full payment must be made. This way, the practice

will be on the downhill side of the learning curve, or completely past it, before making the full payment on its new machine.

Depending on the time of year and a practice’s specific tax situation, there may be some substantial tax savings available for certain types of financing. An Operating Lease, also known as a True Lease, may be a way to finance the equipment needed while realizing tax savings sooner. Since every business’s tax situation is different it is difficult to go into too much detail on this subject. Practices should consult with a tax advisor early in the financing process of any equipment acquisition.

By avoiding the mistakes above and utilizing the options discussed, you will have the flexibility necessary to acquire the latest equipment while conserving capital, matching your payments with your cash flow, and managing obsolescence. While at the same time, you will preserve your sanity and have the peace of mind to know that you financed your equipment at a fair rate and in a way that gives your practice the best chance to succeed in today’s competitive environment.

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# Avoid “Future Shock” on Roth IRA Conversions

By Bonnie Ciresi, CPA, Partner • Mountjoy & Bressler, LLP • bciresi@mountjoybressler.com

Look into the future: You may benefit from the conversion of a traditional IRA to a Roth IRA. However, if you are not careful, you could end up paying “extra” tax when you finally take this step.

Background: The annual contribution limits for traditional IRAs and Roth IRAs are the same. For the 2007 tax year, you can contribute up to \$4,000 to either type of IRA (or a combination of both). The contribution limit is \$5,000 if you are age 50 or older. Contributions to a traditional IRA may be deductible if you do not actively participate in an employer’s retirement plan and your adjusted gross income (AGI) does not exceed a specified level. Roth IRA contributions are never deductible.

The primary attraction of the Roth IRA is that qualified distributions are completely exempt from income tax. This includes distributions from an account in existence for five years that are made after age 59½, on account of death or disability or to pay first-time home-buyer expenses (up to a lifetime limit of \$10,000).

In contrast, distributions from a traditional IRA may be taxed at ordinary income rates. Thus, there is a tax incentive to convert a traditional IRA to a Roth IRA, even though you must pay tax on the conversion.

Tax complications: Under current law, you can convert to a Roth IRA only in a year in which your AGI is less than \$100,000. However, a recent tax law change removed the \$100,000 AGI barrier, beginning after 2009. Furthermore, for a conversion taking place in 2010, you can spread out the resulting tax over the following two years (i.e., 2011 and 2012).

In light of this pending tax break, some individuals have chosen to set up a nondeductible IRA. Reason: With a nondeductible IRA, only the earnings are taxable when distributions are made. This will enable you to shift more funds to a Roth IRA after 2009.

Caution: Be aware that you cannot simply take distributions from your nondeductible IRA if you have other IRAs. Any distribution is treated as coming on a pro rata basis from each IRA. This means that you might have to pay more tax than you think when you convert to a Roth IRA.

One possible solution is to roll over funds from traditional IRAs to your company retirement plan, such as a 401(k) plan (assuming the plan permits it). If it is handled properly, there is no current tax on the rollover. When you are ready to convert to a Roth IRA in 2010, you will be left with only a nondeductible IRA.

Similarly, you might have your spouse establish a nondeductible IRA if he or she does not have traditional IRAs funded with tax-deductible contributions. Of course, you still must pay tax on your 401(k) contributions after you retire, but you will have some flexibility over the distributions. Generally, distributions from a 401(k) or traditional IRA are required to begin by the year after the year in which you turn age 70½. Also, it is likely you will be in a lower tax bracket in retirement than you are while working full time.

What is the best course of action? Work out a game plan for the future. Don’t hesitate to seek professional guidance in this area.



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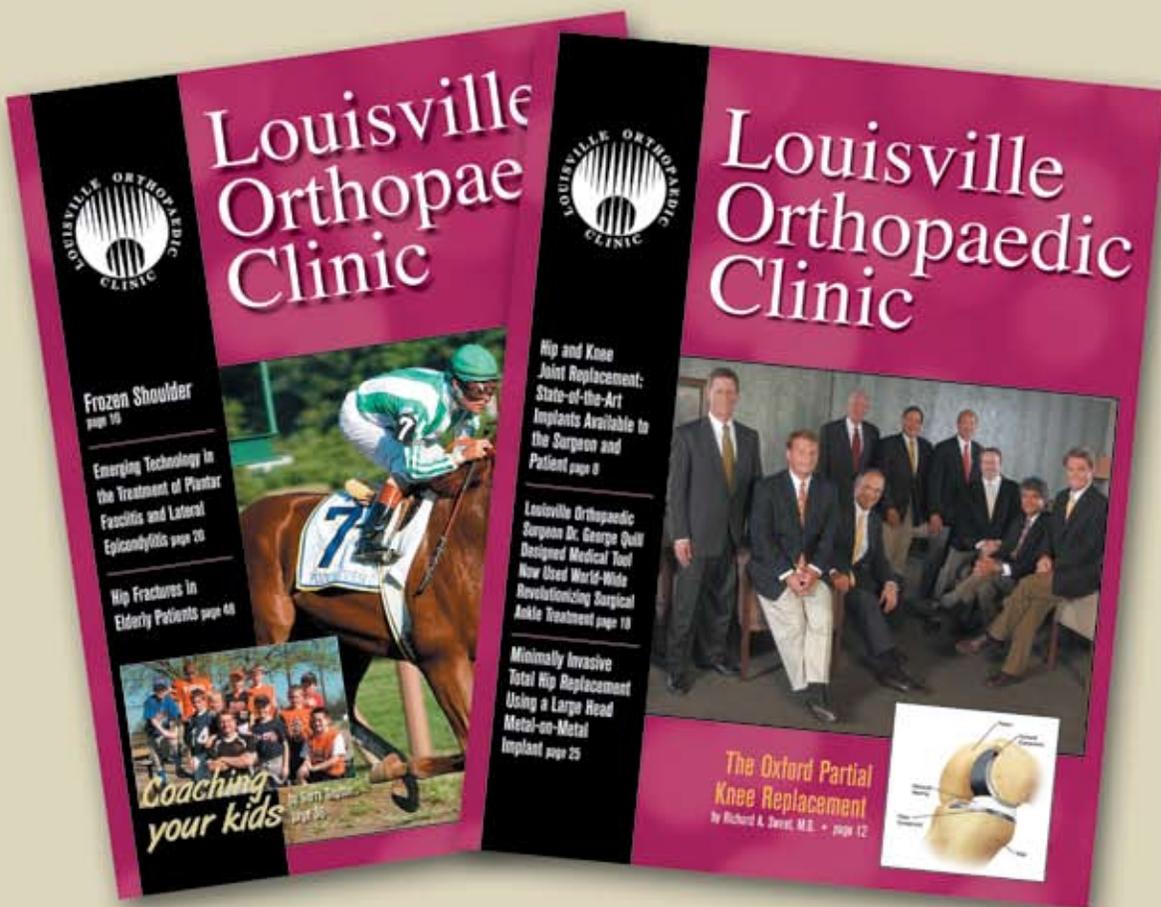
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- Massage and holistic therapy

### Dementia care

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- Activities aimed at meaningful days
- Psychologist-directed team and family support

### Rehabilitation Center

- All private rooms in neighborhood setting
- Care manager coordination to facilitate discharge home
- Specialty medical care in house
- Excellent therapy and nursing team

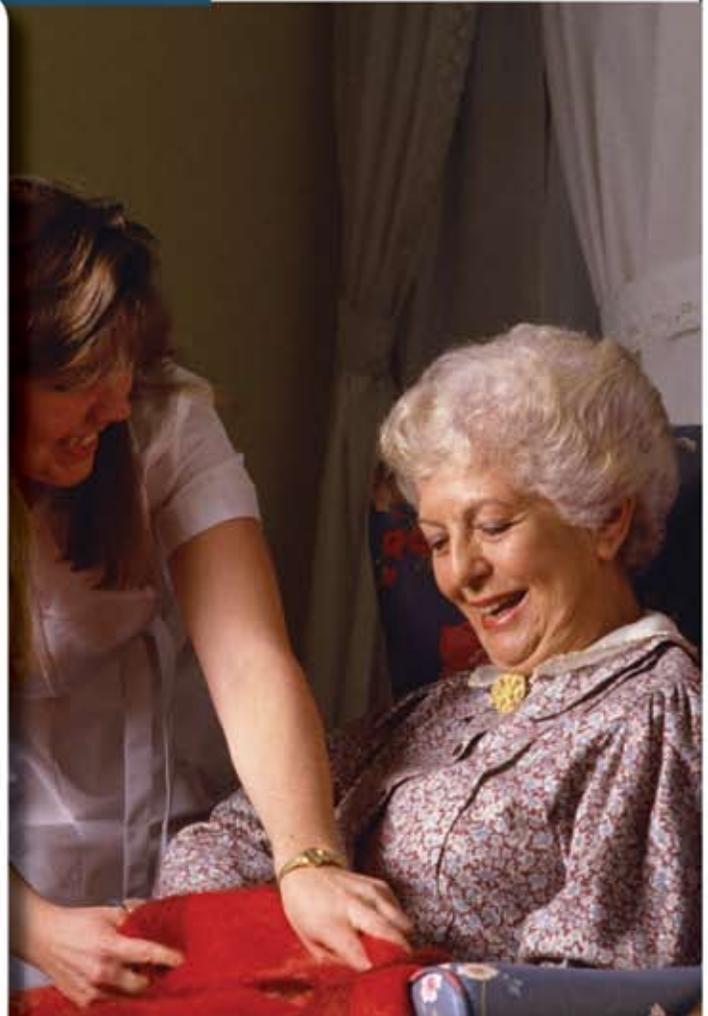
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# Our environment makes the difference...

*by: Brook Wilson, Community Education Director and Cindy Linton, Rehabilitation Manager, Nazareth Home*

Our goal is the same as yours – for you to return home as quickly as possible.

Nazareth Home, engaging our mission to serve the community, our new rehabilitation unit is especially designed for the privacy and comfort needed to recover from a joint replacement, orthopedic surgery or hospitalization.

## **What is Rehabilitation to Home?**

Hospitals are wonderful when we need them for illness or surgery but most of us want to go home as soon as we can and we want to recover at home. When a surgery requires rehabilitation however, studies show that receiving the therapy in an in-patient setting such as a nursing and rehabilitation center allows for the optimum recovery for the patient. Recovery and therapy in the nursing and rehabilitation center allow the patient to have therapy more than once per day and free the family and patient from other day to day living responsibilities. In the nursing center everything is under one roof and is taken care of allowing the patient to focus on exercise, recovery and wellness.

## **Short term rehabilitation in the nursing center.....**

There is a growth in the number of nursing centers providing therapy services required by orthopedic patients. In the past two years, the Medicare program has provided direction for uncomplicated recovery and rehabilitative stays to leave the hospital inpatient units and come to the nursing center. The nursing center provides a home like setting, around the clock nursing care and the range of therapy services provided in the hospital. The clinical care is equivalent and the setting easier for patient and family.

## **How is short term rehabilitation paid for in the nursing center.....?**

Medicare part A is hospital insurance that continues to pay for skilled nursing and therapy services in the nursing center when the clinical care being provided is an extension of the care began in the hospital setting. In the case of post surgery care, Medicare part A pays for the nursing and rehabilitation center. The first 20 days are paid by the Medicare part A program 100%. Recovery is often achieved in that time period.

Beginning on the 21st day of the skilled nursing and rehabilitation stay, 80% of the daily charges are paid for by the Medicare program and the 20% can be paid by the patient's private insurance or paid by the patient privately.

## **PEACE OF MIND....**

Recovery from a common and safe surgical procedure such as joint replacement surgery does require a specialized plan of care and considerations for the safety of the patient. An uncomplicated recovery will set the stage for a successful experience that lasts. Many patients are simply not set up at home for recovery to be free from worry of having all their needs easily met. At Nazareth Home, the therapist performs a safety analysis so that every person will stay safe as they leave our care. A customized home exercise and safety plan is a part of every home plan.

## **At Nazareth Home.....**

The recovery and rehabilitation care is under the oversight of a physician certified in rehabilitation medicine. The rehabilitation physician follows the plan of care begun by the surgeon and supervises the program provided by the therapy and nursing staff until the patient returns home. In the Rehabilitation to Home program the majorities of persons meet their recovery goals and return home within less than 30 days.

Rehabilitation to Home is a great answer for consistent, aggressive and expert therapy needed when recovering from an orthopedic procedure. Nazareth Home provides everything you need to return safely home. Our new rehabilitation to home program has already helped satisfied patients return home feeling confident. We invite you to inquire and see if a recovery stay at Nazareth Home would not be your choice for orthopedic recovery.

Brook Wilson, Community Education Director  
Nazareth Home  
2000 Newburg Road  
Louisville, Kentucky 40205  
502-459-9681

# Medical Malpractice Insurance Tests the Mettle of Insurance Companies

By ProNational Insurance Company, a ProAssurance Group company.

Everyone knows history repeats itself, and that may be a scary thought for physicians who remember the malpractice crises that have occurred in each of the last three decades.

What's ahead? The last ten years offer significant clues.

During that period, thousands of physicians were left without coverage as well-known carriers such as St. Paul ceased writing med-mal insurance; and others faced the daunting prospect of cases that wouldn't be defended when Frontier, MIIX, PIE Mutual, Reciprocal of America, PHICO, and others failed or were placed under regulatory supervisions. In each case, these physicians faced the very real prospect of paying malpractice judgments from their own pockets.

But the medical liability market is cyclical; as things have begun to improve, carriers have returned and new ones have entered the market with promises of penthouse protection and bargain-basement prices. Experience shows that undercharging in this volatile line of insurance very often leaves physicians holding the bag.

“Charging inadequate premiums doesn't always mean an immediate failure for a malpractice insurer. Sometimes it's more of a slow spiral into financial problems,” says A. Derrill Crowe, M.D., non-executive Chairman of the ProAssurance Board and its subsidiary ProNational, who retired from his practice of urology in the mid-90s to devote his full-time efforts to the company. Crowe helped found ProAssurance's predecessor in the first malpractice crisis of the 70s.

With Kentucky classified as one of 21 states currently in a medical malpractice crisis by the American Medical Association, choosing the right carrier becomes imperative. There are several aspects physicians should consider:

**Financial strength and stability.** Will your carrier be around for the long haul? One of the dangers of charging cut-rate prices is a lack of adequate funds when it comes time to defend cases or pay losses. Remember that a malpractice case can take as long as five years to conclude, unlike other types of insurance where claims are resolved within a matter of weeks. And costs mount during those intervening years – so do your research and select a carrier with a good financial track record. There are several rating agencies such as A.M. Best, Standard & Poor's, and Fitch Ratings, who follow medical malpractice carriers and report on their financial strength.

**Commitment to Defense.** Any carrier will tell you that when malpractice occurs, cases should be handled equitably and fairly. But what about the frivolous cases? Or the cases where a plaintiff's attorney is demanding an astronomical amount to settle a claim with minimal damages? Will your carrier aggressively defend you, or will they settle just to make the case go away? Your reputation is important to you; and it's of prime importance that you have the assurance of knowing your carrier won't settle a case without your consent. Though it may seem

more economical in the short-run, it actually costs more in the long run—encouraging attorneys to bring more suits in hopes of a settlement, increasing the costs to you and requiring a report to the National Practitioner Data Bank. Ask your colleagues and well-known medical liability defense attorneys for their experience. That’s how you’ll separate facts and action from marketing promises.

**Physician involvement/leadership.** The importance of physician leadership and involvement should be obvious; who better to know the struggles you face as a physician in an increasingly “managed” health care environment? Physician involvement can influence risk management strategies, defense strategies, offer tips on trends and practices, etc. ProNational is fortunate to have physicians as both Chairman of the Board and Medical Director. And ProNational also hears from your colleagues on a regular basis, using over 50 Kentucky physicians from a wide range of specialties and regions to advise and consult on sensitive claims and underwriting issues.

**Contact the state insurance department** to determine if there’ve been any regulatory actions against the carrier, and to confirm the carrier is licensed to do business in Kentucky. In 2003, physicians in one state who were insured by Doctors Insurance Reciprocal (a subsidiary of Reciprocal of America) were left scrambling for coverage after the state Insurance Department warned that the carrier was not licensed and had suspended payment of claims.

Though the pendulum is swinging in the medical liability market, as rate increases are moderating, the nature of medical malpractice litigation illustrates an age-old truth—it remains imperative for physicians to choose a carrier with the financial strength and stability, and commitment to defense, that enable it to stand behind its promises.

## Commitment in Action

A ProNational insured, Bradley Youkilis, M.D., was targeted by a lawsuit he believed to have no merit, as did his defense team. The patient in this case had a family history of breast cancer, and despite numerous, documented recommendations over a period of more than a year by our insured that she obtain a mammogram, the patient did not. Eventually, the patient developed breast cancer, and sued our physician for failing to diagnose it. Committed to his defense, he and the team prepared the case for trial; however, the plaintiff’s attorney realized the case was without merit, and attempted to drop the case contingent upon the signing of mutual releases. What was rare in this case is that the physician refused to sign a release unless the plaintiff’s attorney provided a letter of apology and reimbursement for expenses, which the attorney did. This is very unusual in a malpractice case. The underlying groundwork of the physician and his defense counsel paved the way for a successful outcome.

“I was very pleased with my defense,” said Dr. Youkilis. Another of our insureds also was a target of a lawsuit that resulted in a successful outcome. The case against him involved a patient in poor health who experienced an adverse outcome as a result of a medication that was continued upon her discharge. The plaintiffs alleged negligent administration of the medication, leading to toxicity. However, the physician and his defense team believed there was no causal link between the medication and the plaintiff’s injuries. Rather, the defense contended, the plaintiff’s injuries were related to her pre-existing medical problems (diabetes mellitus, hyperlipidemia, CVA, and a 40-year, two-pack-a-day smoking history). Our insured was the last witness in this case, and after hearing his testimony, defense expert witnesses, and defense counsel, the jury understood the course of events in this case, and returned a verdict for our insured.

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