



# Louisville Orthopaedic Clinic

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Guided Knee  
Replacement  
Surgery page 40

Special Knee  
Replacement for  
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Tommy John  
Surgery page 52

X-Stop Spacer  
Performed by Thomas R. Leonard, M.D.  
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# Greetings from

## THE ADMINISTRATOR OF LOUISVILLE ORTHOPAEDIC CLINIC



We are excited to bring you the fourth edition of the Louisville Orthopaedic Clinic Magazine. It has proven to be a valuable way of providing our patients with information in the advancing field of orthopaedic surgery. The Louisville Orthopaedic Clinic and Sports Rehabilitation Center strives 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 ten 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. We offer onsite conveniences of an open MRI, outpatient surgery suites and a physical therapy department.

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As always, we look forward to serving you in the future.

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*Administrator*



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## Anterior vs. Posterior Approach for Hip Replacement: **HYPE vs. FACT**

Total hip arthroplasty has become one of the outstanding surgical success stories of the last four decades. Of all joints replaced, the hip is arguably the most successful. Subjectively it feels the most “normal”, has the quickest recovery, and with the advent of new metal on metal bearing surfaces is the most durable. However, with the never ending quest to further improve upon this already successful procedure, recent attention has been directed towards the surgical approach and its relationship to speed of recovery and avoidance of complications. Unfortunately much of this attention has been via the lay press, marketing and hype rather than through basic scientific study. Several “studies” that have examined this issue have been biased and/or scientifically flawed. Thus, at this point it is difficult to objectively determine how the surgical approach options affect the final results of hip arthroplasty.

### Surgical Approach Options

There are three surgical hip approaches for total hip arthroplasty that have gained recent notoriety.

*These are:*

1. Anterior
2. Two incision (a combination of the anterior and posterior approaches).
3. Posterior

### Anterior Approach

The modern anterior approach is a modification of the several generation old Smith-Peterson incision. Classically it splits the muscle interval between the sartorius and tensor muscles in the front of the hip. Because of risk of nerve damage, many modern surgeons actually have moved the incision slightly lateral and split through the middle of the tensor muscle fibers.

*The purported advantages of the anterior approach are:*

1. Avoidance of “cutting through muscles” thus making it a more minimally invasive approach. The theory then follows that this leads to a shorter recovery time. (As noted above, many surgeons utilizing the anterior approach for safety reasons actually now do split through the middle of the tensor muscle).
2. Lower dislocation rate due to the preservation of the posterior structures. Thus the standard “hip precautions” of avoidance of the hyper flexed, internally rotated, adducted hip position can be ignored.
3. Ease in exposure of the acetabulum (socket).

*Disadvantages of the anterior approach include:*

1. High incidence of injury to the lateral femoral cutaneous nerve that provides sensation to the outside of the thigh.



2. Increased risk of complications on the femoral side due to difficulty in exposure. These include component mal-position and fracture. This has led to research in femoral stem design modification to what are as yet unproven designs that may have a higher failure rate.

## Two Incision Approach

The two incision approach has been advocated by a few surgeons as the most minimally invasive hip approach. The acetabulum is approached through the anterior tensor-sartorius interval. The femur is approached through a posterior gluteal splitting incision. Recent reports indicate that the complication rate with this approach is excessive and it is currently falling out of favor with most hip surgeons.

### *Advantages:*

1. Reported by some to be the most minimally invasive approach leading to a shorter rehab.

### *Disadvantages:*

1. Felt by many to be the most technically challenging approach.
2. Most independent surgeons have reported an excessive complication rate with this approach and it is widely being abandoned.

## Posterior Approach

The minimally invasive posterior approach is a modification of the historical gluteus splitting approach of many names. It involves splitting (not cutting) through the gluteal (buttock) muscle. There are four small external rotator muscles the top two of which (the piriformis and

superior gemilis muscles) are divided then later repaired. Note that the piriformis by necessity is also divided and left unrepaired with the anterior approach as it inserts at the site of femoral implant insertion.

### *Advantages:*

1. As with the Anterior Approach, it is a muscle splitting not cutting approach. It is felt by many to be the simplest and easiest approach providing for the greatest safety margin for the patient.
2. The speed of recovery is equal to the anterior approach.
3. Exposure of both the socket and femur is straight forward.
4. Due to ease of exposure, there is minimal risk of femoral fracture or implant mal-position.
5. There is less risk of neurologic damage.
6. Any component system, any bearing surface and any type of fixation (cementless or cemented) can be used.
7. With use of modern “large head” implants, dislocations now rarely occur.

### *Disadvantages:*

1. The sole disadvantage has been the historically higher postoperative hip dislocation rate. This risk has been negated by the use of the new technology “large head” implant systems which have nearly eliminated hip dislocation as a postoperative complication (note: as of this writing I have had no dislocations using this hip system over the last several hundred hip replacements).





# LUMBAR SPINAL STENOSIS

Lumbar spinal stenosis is a condition characterized by either low back pain or numbness, and/or a weakness in the lower extremities that occurs with standing, walking, or arising from sitting to standing. Stenosis is a Greek word that describes an abnormal narrowing of a duct or canal. One of the functions of the lumbar spine is to provide a house or a conduit for nerves traveling from the spinal cord to outside the spine. The reader is referred to the description of spinal anatomy in the monograph *Understanding How to Protect Your Lower Back*, which can be provided at the patient's request, or found on the [louortho.com](http://louortho.com) web site. If these conduits become abnormally narrowed or restricted, then the nerves become pinched and may not function properly. The pressure on the nerves produces the symptoms of pain, numbness, or weakness. The majority of patients develop stenosis as a result of wear and tear and the body's attempt to repair. The interlocking (facet) joints and ligaments that join the roof of one house to the other in response to strain become enlarged and cause narrowing of the conduits. Redundant disc tissue or bony enlargement (spurring) around the narrowed disc space can also constrict the conduits. Some patients have stenosis because they are born with or develop a small conduit during childhood and adolescence. Another contributing cause for stenosis can be the development of a deformity (an abnormal alignment) of the spine. Scoliosis,

an S-shaped spine as viewed from the front, and spondylolisthesis are frequently associated with stenosis. Spondylolisthesis is a word derived from the Greek word spondylo meaning spine and olisthesis meaning to slide down a hill. As the vertebrae in the lower lumbar spine are tilted forward, the vertebra above has a tendency to slide forward upon the vertebra below upon which it rests. Therefore, forward slipping of the vertebra above upon the vertebra below is referred to as an olisthesis. If the vertebra above slides posteriorly with respect to the vertebra below, there is a retrodisplacement or retrolisthesis. These deformities (scoliosis, spondylolisthesis and retrodisplacement) alter the alignment of the vertebra and in association with wear in the disc (narrowing of the space between the vertebrae) narrow the conduits. Very often stenosis is a result of both enlargement of bony and soft tissues and deformity.

The fundamental treatment of stenosis relies on the awareness of its dynamic nature. That is the stenosis is more restricting with posture such as standing, walking or lying flat on the back. These positions are associated with a curve in the back similar to that of a sway-back horse. The stenosis is relieved or less constricting in positions like sitting or lying in a fetal position. Treatment of stenosis is simple. Avoid positions associated with sway in the lower back. Don't stand. Don't walk. Alternatively to

Be sure to go to [www.louortho.com](http://www.louortho.com) and read  
*Understanding How to Protect Your Lower Back*





these unacceptable solutions activities of standing, walking and arising can be modified. Stenosis in standing can be relieved by keeping some bend in the hip and knee by placing one foot up on a box or rail, or by leaning against a barstool or desktop while standing. Stenosis is relieved while walking by walking bent over such as leaning on a grocery cart or a walker. The constriction of stenosis with standing, walking and arising can also be relieved by training the abdominal and buttock muscles to take the sway out of the back. Simultaneous contraction of these muscle groups produces a pelvic tilt. Figure 1 illustrates a simple exercise that develops the ability to contract these muscles, however, performing this exercise alone is not sufficient. The patient has to convert this exercise into a posture. Figure 2 illustrates another exercise to develop this motor skill so that a patient can at anytime flatten the back relieving the stenosis. Once the pelvic tilt motor skill is developed the patients have to practice this skill every instant they are on their feet or when arising to the upright standing position. All patients with lumbar spinal stenosis have to devote themselves to the pelvic tilt posture by either using passive aids like the footstool, barstool or grocery cart, or by actively contracting the abdominal and gluteal muscles when upright if these aids are not available.



**Figure 1.**  
**While lying with hips and knees bent contract the abdominal and buttock muscles to flatten the back against the surface upon which you are lying.**

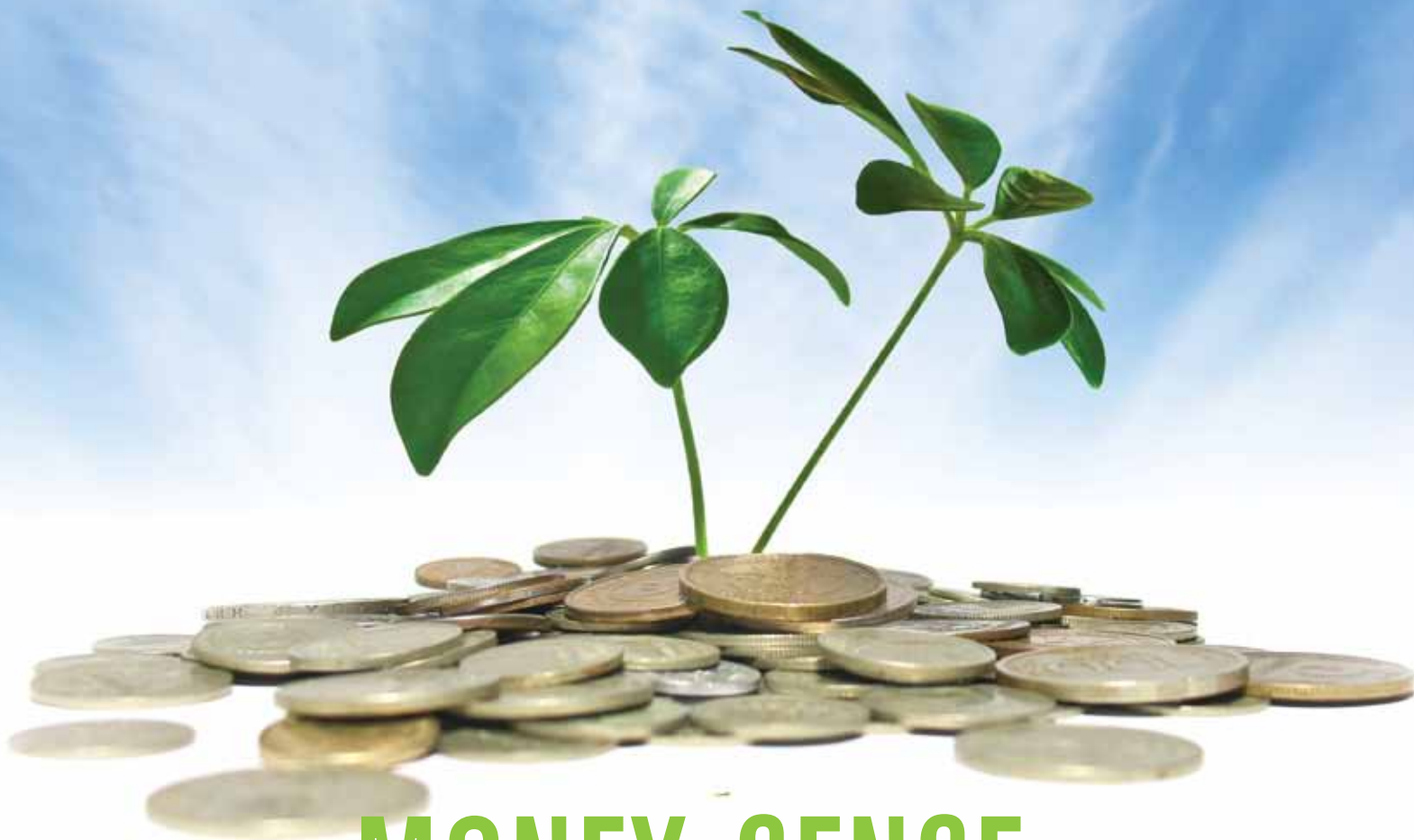
Because there is no spinal cord in the lumbar spine, abnormal constriction of this area will almost never cause complete paralysis, but can cause weakness of muscles that may produce a limp, poor balance, difficulty arising from a low chair or climbing a stairway. With very severe constriction (stenosis) bladder function can be affected such



**Figure 2.**  
**Step 1, stand next to a stable object such as the kitchen counter and hold onto the surface of the object while standing only on your heels (raise the balls of your feet off the floor). Step 2, ignore the tightness in your calves and thighs and feel the tightness of your abdominal and buttock muscles. Step 3 (not shown), while maintaining the tightness of the abdominal and buttock muscles, lower the balls of your feet back to the floor. You are now holding the pelvic tilt posture. Step 4, develop the ability to hold this posture at all times with standing and walking activities.**

that symptoms of urinary frequency or difficulty emptying the bladder may be related to the stenosis and not entirely the result of prostate problems in the male or a fallen bladder in the female. Usually there is ample warning that lumbar spinal stenosis is worsening such that surgery can safely be postponed as long as the patient's condition is monitored by a physician. Surgery is indicated when severe neurologic symptoms (weakness, loss of bladder control) are present or likely to develop in the near future. Surgery can be elected by the patient before severe neurologic problems are eminent if the patient wants to chance the opportunity of improving their ability to stand and walk. Surgical treatment in these situations may be limited to trimming these bony or soft tissues enlargements that have developed. However, if the alignment of the vertebra is compromised, realignment and fusion of spinal segments may be required to unpinch nerves and relieve painful and damaging nerve pressure.

For treatment option for spinal stenosis see X-Stop Spacer article on page 56.



# MONEY SENSE

## Income Planning for the New Retirement

BY AMIE DECAMILLO OF MERRILL LYNCH

Americans—and baby boomers in particular—are completely redefining traditional views of retirement. Not only are people living longer lives than ever before, they now have the potential for many more years of healthy living in which they can choose to extend or re-invigorate their career. This trend is creating a whole new life stage that previous generations have not had – one that includes a balance of work and active living.

In fact, life expectancy for all Americans increased from 70.8 years in 1970 to 76.9 years in 2000. Americans who reach 65 years of age today can expect to live another 18 years; those who reach 75 should live to see 86. For a married couple at age 65, there is a 72 percent chance that one spouse will live to 90 or beyond.

With more time available during their traditional retirement years, boomers are offered more choices on how to spend their active senior lives, from continuing their current employment, to seeking a new career, to pursuing an entrepreneurial venture. The majority of these boomers are planning to remain active in the workforce or plan to continue working in some fashion.

According to 2006 findings from The Merrill Lynch New Retirement Study, 71 percent of Americans between ages 25 and 70 envision working into retirement—and 45 percent of this group say they never plan to stop working. Of those who do plan to quit completely at some point, the average age they plan to cease working is 70.

<sup>1</sup> U.S. Census Bureau, Current Population Reports, p.35, 65+ in the United States: 2005, U.S. Government Printing Office, Washington, DC, 2005.

<sup>2</sup> Kiplinger's Retirement Report, Volume 11, Issue 2, February 2004.

What age to cease working and what shape their career may take during traditional retirement years is just the first step in the new view of retirement. As part of this paradigm shift, boomers must also rethink certain traditional financial strategies to ensure they have sufficient income to support their lifestyle goals during this newly defined life stage.

### Making Retirement Goals More Attainable

At first blush, the ability and willingness to remain in (or return to) the workforce for additional years might seem like a boon to individual savings and retirement planning.

The income provided by additional years of work reduces the need to draw down assets, allowing funds in tax-advantaged IRAs and 401(k)s to continue compounding, tax-deferred. However, longer life spans and varying stages of retirement still require careful planning and the financial resources to navigate these changing patterns of income and expenses without outliving their income. Boomers may be more in tune with these issues than might be expected, as concerns about money underlie survey respondents' anxieties about retirement preparedness.

Traditionally, funds for retirement have been represented by a "three-legged stool" of Social Security, pensions and individual savings. According to the survey, possible Social Security cuts are the top retirement concern (cited by 69 percent of respondents), regardless of age. That factor, coupled with the collapse of many companies' defined-benefit plans and uncertainty about future health care costs, helps to explain why 41 percent of all survey respondents do not feel at all prepared financially for retirement.

Inflation is an important factor to consider when evaluating a retirement savings strategy.

Even at a relatively benign 3 percent annual rate, inflation can cut purchasing power in half over the next 30 years. At 4 percent, it would only take

18 years to lose half of your purchasing power. In addition, when factoring in healthcare costs—which are apt to continue increasing—a portfolio that is invested primarily in fixed income investments will not likely be enough to sustain someone through retirement because the returns generated are unlikely to provide the growth necessary to outpace inflation.

### Setting Income Expectations

In terms of preparing for your next life phase, you shouldn't focus just on when you plan to retire, but how you plan to retire, since your retirement is likely to be unique to you and to have multiple phases. As a starting point, consider your answers to the following questions:

- How long do you plan to continue working and what kind of compensation do you expect?
- What activities and hobbies do you plan to pursue?
- Realistically, what income level will you need to support your lifestyle in these different phases of retirement?
- How do you plan to provide for health insurance and other health care costs?

A good exercise for this analysis is to estimate your expenses over the next 30 years and how these patterns may change as you transition through different phases of retirement. Keep in mind that this does not need to be an exact calculation, but it should include a realistic estimate of your regular monthly bills and include a reasonable allotment for travel, entertainment and emergencies.

Next, write down all of your expected sources of lifetime income—any pensions or annuities and Social Security, and of course a realistic estimate of any employment or business income. As you project these amounts out across different phases of retirement, any shortfall between income and expenses will need to be made up from your savings and investments, so you'll need a strategic asset allocation plan that not only meets any gaps today, but also potentially outpaces inflation down the road.



## Tailoring Your Financial Strategy

The following strategies can be a good foundation for helping you sustain a lifetime income stream and achieve your optimum retirement lifestyle:

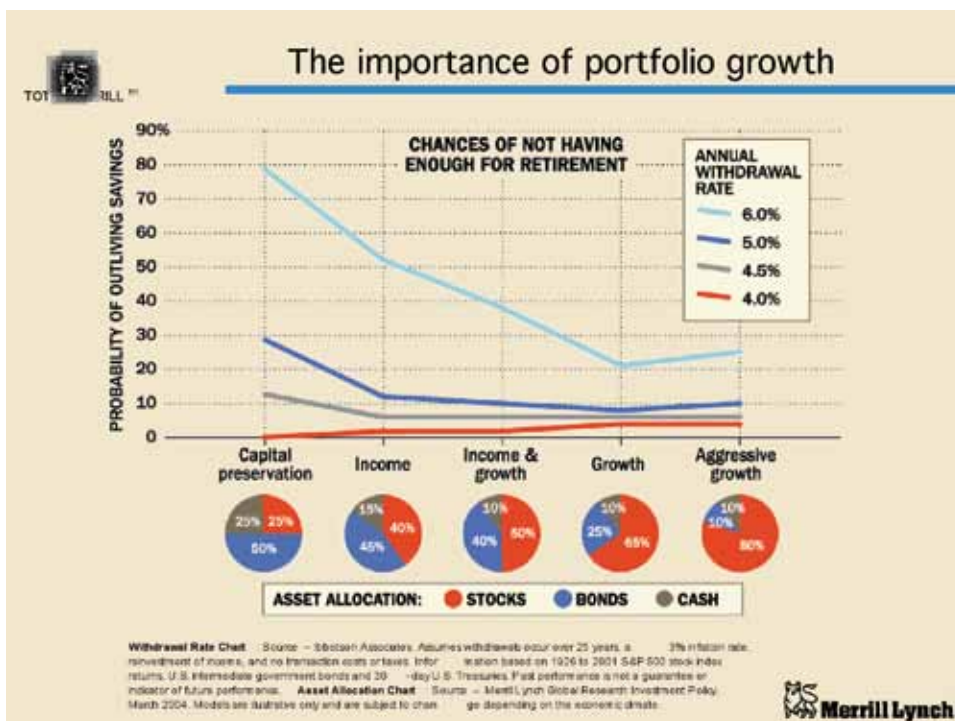
**Develop a sound asset allocation strategy.** Aside from establishing a reasonable rate of withdrawal from your savings and investments, particularly in the early years of retirement, how you allocate your investments across stocks, bonds and cash, can have a significant impact both on the volatility of your investments and on your chances for a successful retirement strategy. As “The Importance of Portfolio Growth” (below) demonstrates, maintaining some exposure to equities is critical to giving your strategy a good chance to succeed. Investing some portion of your portfolio in equities, although more volatile than bonds and cash, can help provide the growth needed to decrease the risk of you outliving your assets in retirement.

accounts, such as IRAs or 401(k)s, to continue compounding as long as possible.

**Consider an annuity.** Purchasing fixed or variable annuities with optional living benefits to guarantee some amount of monthly income for the rest of your life can help provide peace of mind that regardless of what happens or how long you live, you have a guaranteed floor of income. While you probably shouldn't rely completely on annuities for retirement income, they can be effective tools helping ensure that your basic non-discretionary expense needs are covered.

**Time Social Security payments.** Another important factor is when you will begin collecting Social Security. If you elect to do so at age 62, your monthly benefit will be considerably smaller than if you wait longer. Remember, too, that if you plan to work while collecting Social Security, your benefits may be

reduced. Waiting to full benefit age or even until age 70, will result in a greater benefit, which may be an important source of income later in retirement, since it lasts as long as you are alive and is indexed to increases in cost of living.



**Sell smart.** Making decisions about which securities to liquidate—and when—is also key. As a general rule of thumb, you should sell securities in taxable accounts first and allow those in tax-deferred

the new retirement. Your Financial Advisor can also help to simplify your ongoing cash flow management in retirement and keep you on track with your retirement plan.



For example, the Merrill Lynch Retirement Income Service simplifies four critical steps of successful retirement income management: creating a comprehensive approach, developing a supportive investment strategy, automating and simplifying cash-flow management and monitoring results regularly to stay on track. Armed with this service and the experience of your Financial Advisor, you can transition smoothly into this exciting new phase of your life.

*Amie DeCamillo is the Managing Director of the Retirement Group at Merrill Lynch.*

*The 2006 Merrill Lynch New Retirement Study: A Perspective from Individuals and Employers was released in May 2006. For more information on the study, visit: [www.totalmerrill.com/retirement](http://www.totalmerrill.com/retirement).*

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# Metal-on-Metal Hip Replacement – The Future

Cementless hip replacement has been very successful since the early 1980's. The stems and sockets for the most part would remain attached to the patient's skeleton, but the plastic or polyethylene socket would wear and require replacement.

Thirteen years ago I started with nine other surgeons an FDA study on metal-on-metal cementless hips. This was extremely successful and none have required replacement. Since then numerous companies in the orthopaedic field have reinvented those early studies and now it is an operation available not only to the young, but the more healthy elderly patients.

## History

Early cemented hips generally had a lifespan of 10 to 15 years, although I now have some over 30 years. Failures resulted in very complex operations and frequently gave a less desirable functional result. The titanium stem with the chrome cobalt ball and socket have now become the most acceptable joint implant for longevity. Laboratory studies have wear up to 25 to 30 years.

## Indications

It is my opinion that anyone healthy under 75 to 80 years of age may have a metal-on-metal hip articulation, as the larger surface of the ball and

socket leads to improved function and stability, thusly leading to much lower incidence of dislocation.



Other options include ceramic on ceramic for those that may have a metal sensitivity and large ceramic ball on a new improved polyethylene socket.

## Ceramic Bearings

Certainly many patients have had successful functional results with ceramic-on-ceramic articulation, and there have been improvements to avoid cracking and the "squeaking" phenomenon. Ceramic may have an equal longevity to metal, but there is certainly more problem associated with notching or scratching of the surfaces.

## Metal-on-Metal Total Hip

Professor Ring from England had the initial complete metal-on-metal joints, but unfortunately had a problem in attaching them to the bone. The few that did remain are still functioning at nearly 40 years.





**Recent reports of hip resurfacing are showing that the results are improving, and in a very young individual such as 20's and early 30's this may be a consideration.**

Most of the major orthopaedic companies now have metal-on-metal articulations, and laboratory studies do show great longevity. The subject of chrome ions and other particulate matter has always come up for years, but no one has shown this to be detrimental to the human body. Where there is insufficient knowledge about childbearing young women, ceramic on ceramic or ceramic on polyethylene may be a wiser choice.

At this point in our development in metal hips, once the bone has ingrown to the implants the prosthesis may well last the remainder of anyone's life.

### **Hip Resurfacing**

This procedure has been dubbed a new operation by some, although it started back in the last 70's. Most surgeons have not returned to this method of anterior approach and resurfacing due to a history of higher complications and revisions.

This surgery involves approaching the hip from slightly in front and placing a cup over a reshaped ball, rather than removing the ball itself. It is a more

difficult operation and has pitfalls not only with surgery, but also with long-term follow-up. Recent reports are that the results are improving, and in a very young individual such as 20's and early 30's this may be a consideration.

### **Summary**

At the present state of knowledge in our industry of orthopaedics, the metal-on-metal hip with large bearing surface may be the implant of choice. Certainly ceramic on ceramic, ceramic on polyethylene or metal on polyethylene can be used in selective cases. In any case, the younger more active population has a chance at a permanent hip implant. In the older population, up to at least 75 or 80, one can be treated with the same prosthesis for improved stability. Health, bone density, and functional ability all enter into the decision of which hip.

Research is ongoing and there has been discussion of other surfaces, including diamond, but for the moment we have hip replacements that may well represent the permanent solution to all age groups.



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# EXERCISE TRAINING

The Key to Unlocking the Secrets of Longevity and Healing

*by* Mark J. Gloth, D.O.





In 1513, the famed conquistador Don Juan Ponce de Leon charted a course from Puerto Rico in search of the fabled restorative waters of eternal youth. Since that time researchers and scientists alike have been in search of that proverbial fountain of youth. Despite these storied efforts and the remarkable advances in pharmacologic science and surgical technology, the aging process continues to convert the seemingly fit older adult into the frail elder. As each of us ages, we experience changes in our body composition with a loss of lean muscle tissue, gain of adipose tissue, and loss of bone mineral density which result in postural changes and are soon accompanied by neurologic and cardiovascular changes that precipitate progressively increased risks of illness, injury and death. These effects of aging are identified as chronic disabilities in more than 78% of seniors.

Indeed, since Plato first admonished that it was “the lack of activity that destroys the good condition of every human being, while movement and methodical physical exercise save it and preserve it,” physical activity has been recognized as a critical aspect of health and wellness in the elderly. Physical medicine and rehabilitation has had an increasingly important and well-substantiated role in the management of care in the elderly. Clinical trials involving older patients have shown that moderate levels of training on a regular basis are effective in combating the biological and physiological changes that occur with aging such as osteoporosis, degenerative joint disease, obesity, and muscle atrophy. Training in the form of **endurance exercises, strengthening programs, and the martial arts** has been demonstrated to inhibit many of these physiological changes associated with aging.

### Endurance Training

Endurance training traditionally includes aerobic activities such as walking, jogging, running, cycling, and swimming. Regular aerobic activity is generally known to improve functional mobility and enhance cognitive ability in seniors. In addition, the weight

loss associated with these activities has been shown to reduce the severity of joint pain and dysfunction significantly. Swimming and pool exercises cause less joint stress and, when done in a heated pool, may actually provide analgesia. For an aerobic exercise program to be effective, however, one must be willing and able to participate in the activity. Many seniors entering into a rehabilitation program are prohibited from participating in traditional endurance exercises because of orthopedic limitations or physical impairments while others simply find these activities to be tedious and without focus. In an effort to improve compliance, many rehabilitation programs have embraced commercial technology and incorporate alternative treatment options, like the Wii gaming system, into their traditional rehabilitation regimen. The Wii game console’s unique, motion-sensitive controller requires body movements similar to traditional therapy exercises in a therapeutic application known as Wiihab. The game format of the Wii creates a sense of competitiveness and provides central nervous system stimulation which is suspected to result in enhanced secretion of both norepinephrine and serotonin. Early studies report that Wii programs provide only a 50% increase in energy expenditure as compared to sedentary video games; this graded activity in seniors utilizes small and large muscle groups, incorporating repetitive muscle contractions and elevating the heart rate up to 40% of maximum in many patients. Additionally, studies in traditional rehabilitation patients have demonstrated that patients utilizing the Wii have improved visual-perceptual processing, enhanced postural control, and better functional mobility as measured using gait distance. While there remains much research to be done to study the benefits of products like the Wii, innovative therapy options are beneficial in improving compliance among all patient populations.

### Strength Training

It is never too late to start lifting weights and strength training adds a much needed dimension



to any rehabilitation program. The normal process of aging results not only in a decreased number of muscle fibers but also in diminished circumferential area of the existing muscle fibers. This combined with an increase in adipose tissue and a loss of bone density contributes anatomic instability and structural deformities as one ages. Muscle growth and prevention of muscle atrophy occurs with the use of free weights, Thera-bands®, or other resistive exercise equipment. Weightlifting can help increase bone density and slow the loss of bone, lessening the risk of osteoporosis. It can strengthen joints and the surrounding ligaments, tendons and muscles, make losing weight easier, and, in many cases, improve one's general sense of well-being. In one study at Harvard, 90-year-olds who had not been able to walk unaided for years regained significant functional mobility after a 10-week supervised weightlifting program. Incorporating strength training into an exercise training routine can have significant protective benefits in the prevention of functional decline.

## Martial Arts

Tai chi, with its focus on breathing and flowing gestures, is often described as “meditation in motion”. It emerged sometime between the 1300s and the 1600s in China. Some say it was developed by monks, others by a retired military

general. Regardless of origin, its ancient roots are in the martial arts, but tai chi movements are never aggressive. They are based on shifting body weight through a series of light, controlled movements that flow rhythmically into one long, graceful gesture. The sequences have poetic names, such as “waving hand in the cloud” or “pushing the mountain,” and can be quite beautiful to an observer. Although there are no good, controlled studies that prove tai chi specifically benefits the elderly, there are studies that evaluate its safety for patients with multiple physical impairments. One study in 1991 concluded that 10 weeks of tai chi classes did not aggravate joint problems and found that the weight-bearing aspects of this exercise have the potential to stimulate bone growth and strengthen connective tissue. It is widely thought that mind-body alternatives, such as tai chi and meditation that focus on psychological as well as physical function, could be beneficial when used with conventional medications. However, scientific investigation of the therapeutic value of tai chi is still lacking.

## The Keys to Success

The keys to healthy aging are no different than that for most physical therapy and exercise programs: enrollment and compliance. More than 50% of patients fail to complete the recommended program of exercise. Physicians can enhance the rate of compliance by establishing clear goals and objectives and by reinforcing the benefits of compliance. However, the most important ingredient to a successful healthy lifestyle program that involves active patient participation is compliance. Patients must be excited about the program and must see short term benefits clearly. Initiating a program that encompasses innovative ideas is often times paramount to a successful program.

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Dr. Mark J. Gloth, D.O., C.M.D. Vice President and Chief Medical Officer for HCR Manorcare – parent company of Louisville's Premier Physical Medicine and Rehabilitation Center, *Christopher East Health Care*.



# Osteoarthritis and Bracing

Arthritis is an inflammatory condition that affects the body's joints. Of the many forms of arthritis, osteoarthritis (OA) is the most prevalent, affecting nearly 50 million Americans<sup>1</sup>. The knee is the joint most commonly affected by symptomatic, or painful, osteoarthritis. According to a recent study by the Centers for Disease Control and Prevention nearly one in two people, and two out of three obese adults, will develop symptomatic knee osteoarthritis in their lifetime<sup>2</sup>. It is also estimated that 16% of adults in the United States currently suffer from knee OA<sup>1</sup>. Osteoarthritis accounts for 55% of all arthritis-related hospitalizations, and knee and hip joint replacement procedures account for 35% of all arthritis-related hospital procedures<sup>1</sup>. In 2006, approximately \$18 billion were spent on hospital costs alone associated with knee replacements<sup>2</sup>.

Osteoarthritis pain is oftentimes debilitating in its effects on the body. OA of the knee is one of the five leading causes of disability in the United States<sup>1</sup>. While the risk of developing most types of

arthritis increases with age and may also be linked to certain genetic factors, there are measures that may be taken to lower the risk of developing painful osteoarthritis. Maintaining a healthy weight reduces

the load placed on the joints, regular exercise, and proper treatment for joint injuries may help to delay or prevent the development of OA.

Currently there are many treatment options available for painful osteoarthritis. Anti-inflammatory and analgesic medications are often the first line of treatment. Patient education, physical therapy, and weight loss are frequently part of the treatment plan as well. Ultimately, definitive treatment is often in the form of total joint replacement.

Another treatment option that may help patients with knee OA to prevent or delay joint replacement surgery is the use of functional bracing.

Functional knee braces made for treatment of osteoarthritis, often called unloader braces, provides a mechanical means to reduce pain and increase







joint stability. Unloader knee braces are designed to stabilize the knee joint, shift forces to the unaffected compartments of the knee, and restore function. This type of knee brace is typically custom-fabricated and fitted to the patient by a qualified healthcare professional.

Unloader braces provide four major benefits to patients with knee OA. Pain relief is achieved by reducing stress on the affected compartment of the knee and restoring a more normal joint motion. Unloader braces are also designed to improve joint stability. This improved stability often gives patients an increased sense of security and a lower risk of falls. Many unloader braces also redistribute the weight load from the affected compartment to the unaffected compartment. This helps to restore a more normal joint alignment. The fourth benefit is an increased level of functioning. By adding stability and reducing pain, many patients are able to be more active and accomplish functional daily activities more easily.

Unloader bracing is not appropriate for all patients, however. Braces provide the most benefit to patients with mild to moderate osteoarthritis. In cases where the degenerative changes are more severe, or there is

a significant deformity to the joint, bracing is likely not appropriate or beneficial. Additionally, bracing is most effective in patients whose OA affects only one compartment of the knee. In patients where more than one compartment is affected there is no healthy compartment to share the load, and these patients are not likely to benefit from bracing.

It is also important to remember that bracing is not a cure for osteoarthritis. Instead it is a treatment option for patients who do not wish to undergo surgery, or wish to postpone surgery; for patients who are not candidates for surgery because of age or other medical issues; or for patients whose symptoms do not respond to other nonsurgical treatments. Additionally, bracing may not relieve all symptoms of OA. Used in conjunction with other treatments such as medication and physical therapy, however, bracing can prove to be a useful adjunct.

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# YOUR COMFORT IS OUR CONCERN

## Louisville Orthopaedic Surgery Center

Our staff at the Louisville Orthopaedic Surgery Center is dedicated towards providing you with the optimal surgical experience. Most people are somewhat apprehensive about having surgery and experiencing postop pain. With that in mind, we believe that we can minimize your apprehension by explaining what occurs during various phases of your stay with us. In addition, we will also describe some of the interventions that will help manage any discomfort you may experience. It is important that you be able to maintain an acceptable comfort level at our surgery center and at home. The Knee Arthroscopy and the Shoulder Arthroscopy are the most common procedures we perform so the focus of this article revolves around them.

We are a small ambulatory surgery center with a friendly and efficient staff. Overall, you can expect a seamless transition from admission to discharge. The surgeons, anesthesiologists, and staff have spent countless hours working together. The staff and the anesthesiologists were chosen specifically for their technical and personal skills. Your surgery is not just an event, it is an orchestration of many events that must occur to

insure that you achieve the best outcome possible.

Upon admission, you will sign-in with our receptionist, complete any remaining paperwork, and receive an identification bracelet. Then a member of our nursing staff will escort you to one of our preop rooms. You will change into a patient gown, lie down on a stretcher, and receive a warm blanket to cover you. Next we connect you to monitors and take your vital signs. Then we will confirm the planned procedure with you, mark the appropriate extremity with the word "yes", and have you sign the consent form. Placing a mark on the intended surgical site has now become recommended practice to assure correct site surgery (The Joint Commission, 2008). Finally,



Pamela Reichelt  
Tina Underwood  
Ashley Bell  
Claudia Smith  
Julia Barr  
Dorothy Murphy  
Shelly Decker



we have a check list to complete that addresses everything from when you had your last meal to whether or not you are wearing contact lenses.

In orthopaedics, the main reason the patient has sought care is because of pain (Barker, Sikorski, Tompkins, & Lisanti, 2001). So one of the first assessments we do is evaluate your comfort level. We want to know whether or not you are having any pain. We will ask you to choose a number between 0 and 10 that best fits the intensity of your pain. A “0” is no pain and a “10” is the worst pain imaginable. This scale is called the Numeric Pain Intensity Scale (Seidel, Ball, Dains, & Benedict, 2003). It is a simple pain assessment tool, but it helps the staff to determine your level of pain initially and at subsequent intervals throughout your stay with us.

Once our nurses have conducted their initial assessment and obtained your vital signs, an IV (intravenous) catheter is inserted so that we can begin infusing IV fluids. Next, the anesthesiologist completes their assessment and orders your preop medications. Typically, Versed®, Pepcid®, and Zofran® are ordered. These medications will help alleviate anxiety and prevent nausea and vomiting. Our patients having shoulder surgery will receive a peripheral nerve block to numb their arm. Prior to the nerve block the patient may receive more Versed® for sedation and Fentanyl® for pain.

These nerve blocks are very effective and may last 12 hours or longer. Tina Underwood, one of our preop and PACU (postanesthesia care unit) nurses, tracked pain level reports from our arthroscopy patients for nine months. This data indicated that approximately 94% of our shoulder patients reported a pain level of “0” when they arrived in PACU. For more information about peripheral nerve blocks you may read the article written by one of our anesthesiologists, Dr. Tom Neff. Once our preliminary work is complete, we let a family member or friend come sit with you until it is time for your procedure. Often times our patients drift off to sleep while they are waiting.

Then the surgeon will come in to talk with you. He will review the planned procedure and confirm the surgical site. Now you will say goodbye to your family member and be taken to the operating room. When you are in the surgery suite, the operating room staff and the anesthesiologist continue to provide for your comfort. The surgery suite tends to be chilly so you will receive another warm blanket.



The staff will help you move to the operating room bed and the anesthesiologist will give you more medicine to help you relax and go to sleep. The anesthesiologist will help you maintain your airway by inserting an LMA (laryngeal mask airway). There is less chance of experiencing a sore throat with this type of airway. The operating room nurse works with the anesthesiologist to be sure that your arms, hands, legs, and neck are secure and in good alignment. Blankets will cover everything except your affected extremity. Your affected extremity is cleansed in preparation for the procedure. While the nurse is cleansing your extremity, the surgeon is scrubbing his hands. Once the surgeon has scrubbed his hands, he returns to the surgical suite and dons a gown and gloves. If it has not already been conducted, a staff member will conduct a surgical time out. This is when someone in the room (usually the O.R. nurse) verbally identifies you by name, procedure, and site. All staff members must agree this is correct before an incision is made (The Joint Commission).



The surgeon and the surgical technologist work skillfully on your injured extremity. The surgeon makes a couple of small incisions through your skin so that pencil-sized instruments can be inserted into your joint. One of these contains a small lens and lighting system that magnifies and illuminates the inside of your joint. This system is connected to a television monitor so that the surgical team is able to view the interior of your joint. This allows the surgeon to make a final diagnosis and repair any damage (American Academy of Orthopaedic Surgeons, 2007). The surgical team is also very conscientious of where their instruments and instrument stands are in relation to you. They do not want to put undue pressure on other parts of your body.



For knee arthroscopies the surgeon will inject a local anesthetic agent, such as Marcaine®, into the surgical site. This is also an effective method for control of postop pain. Approximately 82% of our patients report a pain level of “0” upon admission to PACU.

Once the procedure is complete, you will be moved back to your stretcher. The anesthesiologist usually gives you more medicine to prevent pain and nausea. Then you are taken to PACU. Once you arrive in PACU, the nurse will ask you about your pain level. If needed, you may receive additional pain medicine. The nurses will also provide you

with another warm blanket and offer you something to drink and eat.



Thus far it seems as if everything we do is based on giving you medication. Several of our comfort measures are not related to medicine at all. Besides providing you with warm blankets along the way, we will also elevate your affected extremity and apply an ice pack to keep the swelling down. Increased swelling can cause more discomfort.

The final part of your stay with us is focused on your vital signs, pain level, and education. We want to be sure you are stabilized after your procedure and satisfied with your comfort level. Pain may affect your physical and psychosocial function. It can have a negative impact on nearly all body systems including the cardiovascular, respiratory, gastrointestinal, and endocrine systems (Piacentine et al. 2004) so we want to be sure that you and your family understand pain control measures. These measures include the following;

1. Begin taking your pain medicine when you first notice any aches or slight discomfort.
2. You may need to take your pain medicine consistently every 4 hours the first 24 to 48 hours postop.
3. Do not take your pain medicine on an empty stomach. Always take it with a few crackers or a few bites of food.



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4. Continue to elevate the affected extremity above the level of your heart.
5. Continue to apply ice as ordered by your surgeon.
6. Continue to rest the extremity as ordered by your surgeon.

Our patients having a shoulder arthroscopy will require a sling for their arm. Sometimes our knee arthroscopy patients need crutches. We also want to be sure you and your family member know when to remove your bandage, how to care for the incision, and when to return to the doctor. You also need to know the limits of your activity and when to call the doctor.

We trust that you have found this article helpful. Pain management is taken seriously and we provide it across the continuum of care. Overall, 94% of our patients are discharged home with a reported pain level of 4 or less. However, a number is just a number. The most important part of the pain assessment is that you the patient report satisfaction with your comfort level. We also hope this information eliminates any fear of the

unknown. Most of us have had surgery ourselves and we genuinely empathize with you, the patient. In all sincerity, we want you to know that your comfort is our biggest concern.

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# Out with the new, in with the old?

You now have the option of getting your prescription filled in our office.

The idea of getting your medications from your doctor's office may seem unfamiliar and new. However, it used to be the norm. Until the early to mid 20th century, physicians dispensed the medications while pharmacists manufactured them. When pharmaceutical companies began manufacturing and distributing medications, pharmacists started dispensing what the doctors prescribed.

When you think about it, many physicians already dispense medications in the form of samples, infusions and injections. In-office dispensing allows your doctor to fill all the prescriptions they write for you without you having to leave the office. Why have we decided to offer this service to our patients? We believe it is just good healthcare. Dispensing in-office is safer, cheaper, more efficient and far more convenient than driving to a pharmacy and waiting up to an hour for your medications.

## Safety

When the prescribing physician directly oversees the filling of your prescription, dispensing errors are nearly eliminated. According to the Institute of Safe Medicine Practices, more than 3 million of the adverse drug events that occur each year are preventable. These adverse drug events (i.e.,

illegible writing of prescriptions, unclear telephone/verbal orders, unclear abbreviations, unclear or inappropriate dosages, etc.) cause physicians to spend time on the phone correcting the errors, time they could be spending with their patients – not to mention the dangers associated with these issues.

In addition, all medications are prepackaged and safety sealed at the factory in high-density polyethylene bottles in accordance with FDA and DEA approved tamper resistant packaging and requirements. The service is specifically endorsed by the American Medical Association and the American Academy of Family Physicians.

You have to ask yourself, who is better prepared to ensure you receive the proper medications than the doctor who prescribed it?

## Cost

Doctors who dispense are more aware of the costs of the medications they prescribe. Your doctor, unlike a pharmacist, can make lower-cost generic substitutions on the spot, while staying therapeutically sound. Traditionally, a pharmacist has to call the physician's office to make that change, then wait for the physician to call back with approval. This additional wait time (often the



patient must leave and return) means you are not getting the medication you need in a timely manner and your treatment is being needlessly delayed.

### Efficiency

Compliance is a medical term that is used to indicate a patient's correct following of medical advice, most commonly as it applies to taking prescribed medication. An estimated half of those for whom medicines are prescribed do not take them in the recommended way. With physician dispensing, patient compliance increases by more than 60 percent. This translates into lower overall health care costs and healthier patients.

### Convenience

Perhaps the most obvious benefit of physician dispensing is convenience. The typical pharmacy wait time can be upwards of one hour, not including the time it takes for you to drive to the pharmacy after your visit to the doctor. The pharmacy wait time is due in large part by design. As a retail business the pharmacy is oriented more for sales than for health care. Extra time in their store means more of your dollars. Physician dispensing allows you to receive your medications at the point-of-care and allows your treatment to begin immediately.

A recent survey conducted by Opinion Research Corporation, interviewed 1023 adults, and found 75% would prefer to have their prescription filled in the doctor's office instead of the pharmacy if given a choice.

Physician dispensing, like X-rays, lab tests, ultra sounds and minor out-patient surgery, is part of our plan to provide you with better healthcare.

While it is a departure from what we as a society have become accustomed to over the years, it is safer, cheaper, more efficient and far more convenient than driving to a pharmacy and waiting for your medications. Ultimately you, the patient, and we as your physicians have the same goal – for you to be as healthy as possible, and when you are in need of treatment for you to have the best care possible. In that spirit, we look forward to filling your prescriptions and getting you back on your feet as quickly as we can.





# Peripheral Nerve Blocks

THOMAS NEFF, M.D.

The Louisville Orthopaedic Surgery Center contracts with an independent anesthesiology group, Williams & Wagner, to provide anesthetic services during your surgery. In addition to general anesthesia, many of the surgeries performed use regional anesthesia to provide pain relief during and after your surgery. The most common surgeries utilizing peripheral nerve blocks at our facility are shoulder arthroscopy, ACL reconstruction, and foot surgeries. Knee arthroscopy, another common procedure at our facility, does not require a block due to its low incidence of pain after surgery.

When appropriate, a peripheral nerve block can be performed prior to your surgery to “numb” the surgical location, thus minimizing any postoperative pain and the need for pain medications with unwanted side effects (nausea, sedation). Your anesthesiologist will administer a sedative to allow a more comfortable nerve block. Next, a peripheral nerve stimulator will be used to isolate the specific nerves before injection of the local anesthetic to numb the surgical site. The stimulator will cause involuntary, but not uncomfortable, twitches of your muscles thus allowing a more precise injection. After injection, the surgical area will become numb

and immobile. This can provide 12 to 24 hours of pain relief after surgery, ranging from a significant reduction in the amount of required pain medication to complete pain relief. After this time you will simply begin using your prescribed medications for pain relief.

A peripheral nerve block does not preclude the use of general anesthesia for a more pleasant surgical experience. Most of our patients receive a general anesthetic in addition to their nerve block to avoid any unnecessary stress during surgery. With an effective nerve block you will only require enough anesthesia to provide amnesia and unconsciousness. However, some patients may request sedation only due to previous problems with general anesthesia (nausea, vomiting, allergic reactions).

Complications after peripheral nerve blocks are rare. The most common is a failed block that does not give the pain relief we expect. This is easily corrected with a repeat of the injection or by use of oral and intravenous pain medications. Nerve injury, infection, and bleeding are more rare complications.

If you have other questions, they can be answered by your anesthesiologist on the morning of surgery or by consulting the American Society of Anesthesiologists and American Society of Regional Anesthesia web sites at <http://www.asahq.org/patientEducation/ambulatoryAnes.pdf> or <http://www.asra.com/patient-info/index.html#A>.

Come enjoy the miracles of modern medicine at the Louisville Orthopaedic Surgery Center!

# *Another Great Reason To Make Oaklawn Your Choice For Sub-acute Rehab*

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## **Dr. J. Jason Miller, M.D.**

joined Oaklawn's staff in November 2008 as Director of Physical Medicine and Rehabilitation.



*Formerly with Norton Rehab Physicians and board certified in Kentucky and Indiana, Dr. Miller made the decision to join Oaklawn in order to "make a difference" in outcomes and quality of life for the numerous orthopedic and spinal surgery patients Oaklawn serves every day.*

*As a physiatrist, Dr. Miller specializes in nerve, muscle, bone and brain conditions, providing a full spectrum of care – from diagnosis to treatment and rehabilitation – to restore maximum health and quality of life.*

---

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## PHYSICIAN DIRECTORY



# Comprehensive Orthopaedic Care

To serve your needs our facility consists of ten 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.



#### 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 performing over 6,000 Total Hip Replacements and 5,000 Total Knee Replacements. His surgical prowess has made his counsel much sought by manufacturers of joint prostheses from all over the world. 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.

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. 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.



#### 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 the treatment of knee problems, including injuries and arthritis. 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. He is actively involved in research and invention of total knee procedures.

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 Flager 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 teaching 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.

He 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 and orthopaedic device development. Dr. Quill is a consultant to numerous orthopedic implant manufacturers and maintains an interest in implant design 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 completed the 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.



#### J. STEVE SMITH, M.D.

Dr. Smith specializes in orthopaedic sports medicine and athletic-related injuries. He completed his fellowship training at the Kerlan-Jobe Orthopaedic Clinic in Los Angeles, California, this intensive training and research program is one the country's largest and most respected sports medicine fellowship programs.

He was on the medical staff of the LA Lakers, LA Dodgers, USC Football Team and numerous other collegiate and high school sports teams. He has published numerous research papers, abstracts, and has made presentations relating to the advancement of arthroscopic surgery in sports medicine.

Dr. Smith is a native of Kentucky earning his undergraduate degree at Western Kentucky University and attended the University of Kentucky College of Medicine. He completed his internship and residency at the University of Rochester in New York, and then completed his orthopaedic sports medicine fellowship. He is board eligible in orthopaedic surgery and is a member of many national, state and local medical societies.





### 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 and Physician Assistant Studies.

Prior to her employment with Louisville Orthopaedic Clinic, she had extensive training in the orthopaedic clinic at Fort Knox, Kentucky.

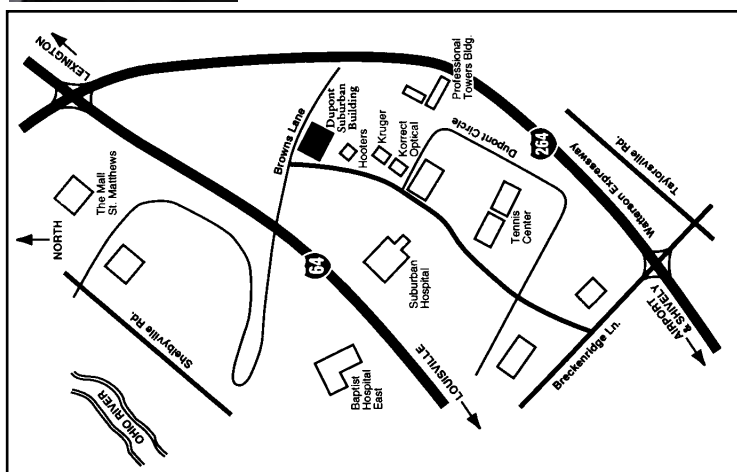
She is a member of the American Academy of Physician Assistants, Kentucky Academy of Physician Assistants, and National Commission on Certification of Physician Assistants.



### 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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# Front Knee Pain: Keeping the Train on the Tracks

Anyone who has played sports, and even some of those who have never set foot on an athletic field, can relate to knee pain. Knee pain is one of the most common complaints seen within an orthopedic surgery or physical therapy clinic, and front knee pain, technically known in medicine as *patellofemoral* or anterior knee pain, can be either some or all of the cause of this often difficult to manage condition.

Patellofemoral pain (PSFS) derives its name from the joint affected; that is, the *patella* (kneecap) that moves upon the femur (thigh bone). A great analogy for the joint could be the femur is a set of train tracks and the patella is the train that runs along top of it. The patella is located on the front of the knee and it is connected to the four muscles in the front of the thigh called the quadriceps. The quadriceps are primarily responsible for the movement of the patella up and over the thighbone, resulting in the straightening of the knee. During the movement, the patella also has to stay within a groove that lies on the thighbone, in other words the "train tracks". When the patella does not stay within the groove during knee movement, the cartilage that lies on the underside of the patella can become inflamed resulting in pain in and around the patella. PSFS is primarily characterized by one or more of the following complaints:

- pain with climbing/descending stairs
- pain with squatting
- pain and/or stiffness with prolonged sitting (AKA movie-goer's knee)
- painful grinding/noise (AKA crepitus) with bending of the knee
- swelling in the front of the knee

These symptoms can begin with pain and/or swelling after a specific sport or activity involving the activities listed. This can progress to pain during the activity, and to always being painful in more severe cases.

PSFS is a very highly based mechanical problem, more specifically it is primarily caused by lack of muscular balance in many different

areas of the lower body, ranging from the foot and ankle all the way up the chain to the hip and low back. The problem can also center solely on the knee itself without influence from other structures. It tends to become somewhat more prevalent as we age, but it can happen any age.

It is more commonly seen in women than in men due to women having wider hips. This results in a larger distance between where the thigh muscles start and where they end, increasing the angle between the thigh bone and shin (known as the "Q angle"). This increased Q angle in women can make this condition more common. Other problems that can contribute to PSFS include ankle tightness, hip weakness and/or tightness, and knee arthritis.

Diagnosis is usually accomplished after the doctor/physical therapist ensures that there are no other serious problems disguised as PSFS. Many times X-rays are taken to make sure there are no bone breaks. With symptoms that have been present for several months or even years, X-rays can show breakdown of the cartilage on the patella. This represents the wear and tear that can happen to the cartilage with years of abnormal movement. Your physician may prescribe medications to help reduce inflammation and pain.

Since PSFS is primarily a problem where numerous structures in the lower body can affect the patella's movement, finding one cause is challenging. However, PSFS does respond well to conservative care and physical therapy.

Traditionally, physical therapy treatment for PSFS has been directed at strengthening the quadriceps muscle and stretching of the surrounding musculature of the knee and hip. Recent evidence supports the strengthening of the hip and the lateral hip, most importantly. When this happens, the strengthened hip improves control of the femur which allows the patella also to move more smoothly and correctly over the femur.

Your physical therapist designs a treatment program to improve how the "train moves on the tracks". He or she will also ensure the rehabilitation program is designed to make certain that the "track does not move from underneath the train". Other interventions a physical therapist might employ include hands-on manual therapy of the various joints in the lower extremity including the back, hip, knee, and even the ankle and foot. Foot orthotics may also be used to help improve the structure of the foot during standing, walking, and squatting. The structure of the foot can affect the patellar movement similar to the way the hip affects the knee joint. Taping and bracing of the knee can also be used to help improve the tracking of the kneecap directly. This can also provide an immediate decrease in pain, along with pain relieving treatments such as iontophoresis, phonophoresis, electrical stimulation, and ice.

Cases with more profound signs of breakdown or lack of kneecap control may not respond well to conservative treatment. These cases may require surgical intervention to either tighten or loosen the ligaments surrounding the knee. Some surgeries may even require realigning the bones themselves in the knee to correct the patellar tracking problem.

Although PSFS can be painful and disabling, often it can be treated successfully. The key for successful treatment, just like with almost every other musculoskeletal problem, is seeking assistance early on from a physician or physical therapist.

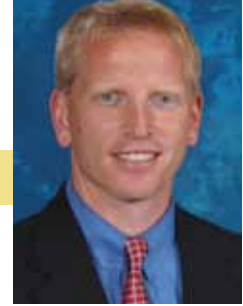


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# Overuse Injuries in Young Athletes

Recently, many local and national media outlets have drawn attention to newly implemented pitch count rules for Little League Baseball. In fact, if you are a fan of the Little League World Series, you probably heard the commentators discuss this topic in detail. These rules have been instituted to prevent common overuse injuries to youth pitcher's shoulders and elbows. In summary, if a pitcher throws more than 85 pitches in a game then he/she has to come out of the game and rest for two days before they are allowed to pitch again. (They can remain in the game at another position.) Little League Baseball has instituted other rest rules for pitchers:

- If the pitcher throws 46 or more pitches in one day, he has to rest for two days.
- If the pitcher throws 21-45 pitches in one day, he has to rest for one day.
- No rest is required for the pitcher if he throws less than 21 pitches.
- A pitcher may not throw in more than one game per day.

The common denominator of all these pitch count rules is rest. Rest allows the growth plates (physis)

in a youth pitcher's shoulder and elbow to recover from the extreme stresses placed on them. The growth plates in children are the weak link in their skeletal makeup and vulnerable to injury when recurrent stresses are placed on them. In children, the majority of growth in the upper arm (humerus bone) occurs at the physis near the shoulder. If this growth plate is not allowed to heal and recover from throwing, it can widen and/or become damaged, which may result in pain, stiffness, and growth disturbances. Injury to this growth plate has been coined "Little Leaguer's shoulder."

The counterpart to the shoulder is "Little Leaguer's elbow." The same pattern of injury is seen here except that the growth plate is much smaller on the inside (medial) of the elbow. Here the same damage can occur at the growth plate as evidenced by widening on an x-ray. Injuries to the inside of the elbow can also irritate the ulnar nerve, injure and stretch ligaments, and, if enough damage has occurred to the medial physis, the elbow may become locked and not move.

If sufficient rest is given to youth throwers then the vast majority of these overuse injuries can be avoided. It is important to remember that these



pitch counts should apply to all throwing that the youth player does. For example, if the pitcher comes out of his Little League game after the allotted 85 pitches, then moving them to a position that is



associated with a lot of throwing (e.g. catcher) may prove troublesome for their shoulder or elbow. As the athlete moves into middle school and high school, the athletic seasons and training for different sports often overlap. It becomes even more important for the player, coaches, and parents to pay attention to how much throwing their child is doing, not just in baseball or softball. It is not uncommon for one athlete to pitch for two baseball teams, be the quarterback on the local football team, play recreational softball, and attend tryout to “showcase” baseball camps all within the same few weeks.

Rest for the throwing athlete is the most important criteria to keep young arms injury free. However, there are other extremely important facets of athletic training to prevent shoulder and elbow injury. Stretching should not be

overlooked and cannot be stressed enough. All parts of the body, not just the shoulder and elbow, should be sufficiently stretched before and after throwing. Proper mechanics of a baseball throw, tennis serve, or football pass utilizes the entire human body from the feet to the neck. I have seen countless athletes who have injured their arms after altering their mechanics for sprained ankles, leg injuries, or back pain. Thus, another important component to staying injury free is proper throwing mechanics. It should be emphasized to young throwers to develop proper fundamentals when throwing. Not only does this improve accuracy, velocity, and endurance, but it goes a long way to prevent injury. There is a reason that Nolan Ryan pitched for over 20 years in the Major Leagues without significant arm injury....dedication to proper mechanics, training, rest and stretching.

Most arm pain in young throwers will resolve with rest, ice, and anti-inflammatory medicine (e.g. Ibuprofen or Naproxen). The rest period required may range from a couple of days to a couple of weeks. An evaluation by a physician is advised if arm pain persists after a few weeks of rest, there is loss of motion, or if the pain persists with non-throwing activities. In summary, arm pain in young throwers will likely resolve if essential rest and recovery periods are observed. If these principles are ignored, then valuable time may be lost on the playing field...which could have easily been avoided.

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# Customized MRI Guided Knee Replacement Surgery

Total knee replacement surgery has become one of the true medical success stories of the last three decades. Advances in implant designs, sizing options and surgical techniques have shortened recovery times and improved ultimate knee function. However, during this time span there has been little improvement in the preoperative advance planning of knee replacement surgery. Now for the first time new MRI based technology offers the surgeon the opportunity to plan in advance a customized three-dimensional surgical strategy for each patient based individual anatomy.

## Conventional Surgical Planning

In the past, planning was based on use of transparent “templates” that were superimposed on a patient’s knee x-rays prior to surgery. This type of two-dimensional x-ray based templating is inaccurate for several reasons.

First, standard x-rays magnify the anatomy of the knee to varying degrees. The variability of this magnification can range from as little as 10% to as much as 25% depending on the diameter of the leg, distance of the leg from the x-ray cassette,

and distance of the x-ray tube from the patient. Changing the angle at which the x-ray is taken can also affect magnification.

Second, many x-rays are now taken by “digitized” technology. These films are viewed on a computer screen via the Internet or by use of a CD disk. Films recorded in this fashion are typically miniaturized. There is no standardization to the degree to which the images are made smaller making preop templating of these films useless.

As a result, most surgeons actually plan the knee replacement intraoperatively. Overall leg alignment is set by either the use of rods placed inside the canal of the femur and tibia or by use of an external rod system that the surgeon “eyeballs” to make parallel to the bones of the leg. Implant size is determined by use of intraoperative tools that measure the front to back and side to side dimensions of the femur and tibia. Rotational position of the implants is estimated by use of an instrument that set the rotation based on the available bony anatomy of the knee. However, many arthritic knees have bone loss that is produced by the friction of the arthritic bone-on-bone wearing process. This loss of bone



**Figure 1. Conventional instruments used during surgery to size and position implants. The left instrument measures knee width and is the cutting guide to make several of the femoral bone cuts. The center instrument measures knee height and sets rotation of the femoral implant. The right instrument sits on a rod that is placed into the canal of the femur and sets the depth of the cut on the femur and the alignment of the leg.**

can lead to inaccuracies when using intraoperative instruments to determine the rotational alignment of the implants.

### **MRI Based Customized Surgical Planning**

**General Concepts:** In an effort to overcome the above noted inaccuracies in planning knee replacement surgery, new technology has evolved. This technology allows the surgeon to accurately and precisely determine prior to the operation the appropriate size and three dimensional position of the knee replacement components relative to the overall alignment of the leg. Thus, in effect every surgical plan is “customized” for each patient in advance of surgery. This means that prior to beginning the operation the surgeon knows the proper implant size for the patient and how the implants are to be aligned and rotationally positioned.

**Technique of MRI Customized Surgical Planning:** This customized planning technique involves performing a preoperative MRI of the affected leg. The MRI maps the three dimensional anatomy of the arthritic knee and its position relative to the hip

above and the ankle below. Overall leg alignment is determined and deformities such as a “bowed” or “knock kneed” alignment are measured. This MRI data is then digitally sent to the implant manufacturer. At present Biomet is the only implant manufacturing company offering this new MRI based customized approach. Via Biomet’s proprietary “Signature” technology and utilizing its “Vanguard” knee implant system ([www.biomet.com/patients/signature.cfm](http://www.biomet.com/patients/signature.cfm)) the MRI data once received is analyzed and the surgical plan created. All specific anatomical features of the knee are mapped. Position and depth of the bone cuts is planned. Implant size that provides for the best fit according to body type and gender is selected. Correct rotational alignment is determined. After its creation, the plan is then digitally sent to the surgeon to review all details to determine its accuracy. If it is felt to be correct, the surgeon may approve the plan as is. A major advantage of Biomet’s Signature technology though is that if the surgical plan is not felt to be optimal, the surgeon has the opportunity at this time to alter the plan. The size of the implant can be changed. The position relative to the long axis of the leg can





**Most patients who can safely undergo an MRI evaluation are candidates for MRI customized knee replacement surgery.**

be altered and the rotation of the implant can be adjusted. Once approved the surgical plan is then electronically sent back to Biomet. Customized cutting guides based on the plan are manufactured. These cutting guides are then shipped to the surgeon and are the intra-operative tools used to accurately align and position the implants.

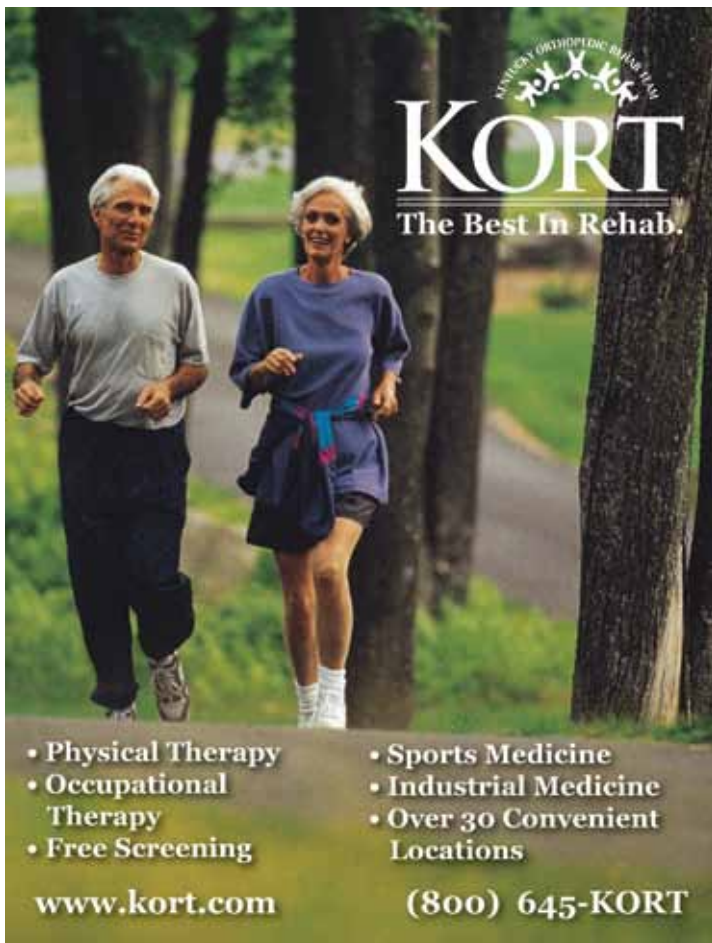


**Figure 2. The customized tool (arrow) manufactured for each individual patient is based off preoperative MRI anatomy. This tool is pinned onto the end of the femur. Bone cutting guides are positioned on these pins to accurately position the implants on the bone and align the leg. For animation see (Adobe flash player required): <http://www.biomet.com/patients/signatureTechniqueAnimationVideoPopup.cfm>**

### **Advantages of the MRI Navigated Customized System**

There are several advantages to the MRI based customized knee replacement planning system.

1. Shorter operative time – Since the implant sizing and alignment issues have been planned in advance, intra-operative time spent making such decisions is eliminated. Shorter operative times are correlated with fewer postop complications (particularly that of infection).
2. More minimally invasive surgery - The custom cutting guides are smaller, lower profile, and positioned such that they are less invasive to the local anatomy. The result is that the surgeon can avoid extensive splitting or cutting into the quadriceps muscle. Protection of the quadriceps muscle (or quad sparing) is the single most important factor in minimally invasive surgery leading to a more rapid recovery.
3. Greater accuracy in sizing and aligning implants.
4. Better balance and stability of the knee ligaments – Knee ligament stability is dependent on many factors, but a key factor is accurately positioning the implants in the knee



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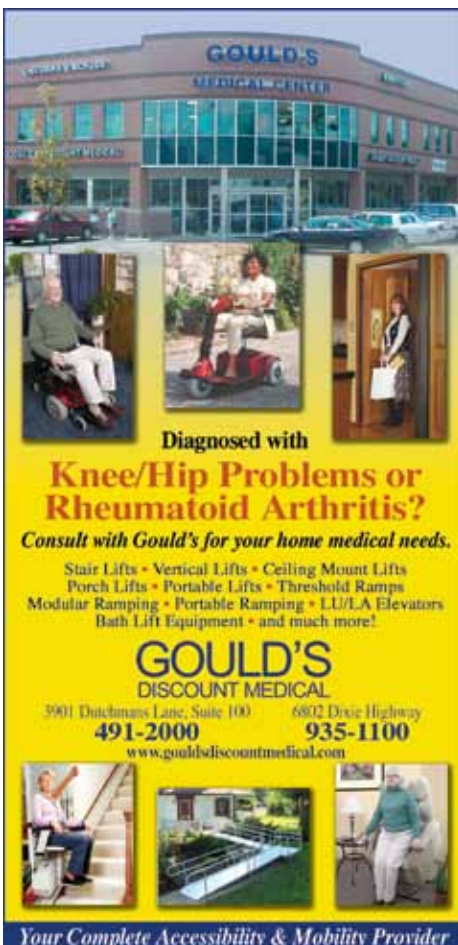
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5. Greatly reduced inventory of instruments required to perform the surgery – This would seemingly not be of primary benefit to the patient but instead be an advantage only to the hospital and operating room staff. Simplifying surgical instrumentation reduces costs to the hospital and reduces turn-over time between surgeries. A streamlined operative instrumentation system that is simpler to set up also reduces the risk of contamination and infection. Anything that makes the operation easier and more straightforward for the hospital, the operating room staff and the surgeon is of benefit to the patient. The adage “the fewer moving parts the better” applies.

### Candidates for MRI Customized Knee Replacement Surgery

Most patients who can safely undergo and MRI evaluation are candidates for MRI customized knee replacement surgery. Very heavy patients may have trouble with the confines of the MRI machine. Uncooperative patients or patients who can not lie still for the 30 minutes it takes to perform the MRI are not candidates. Patients with heart pacemakers may not be able to be exposed to the magnetic field of the MRI machine.

MRI based customized advance planning of knee replacement surgery has several potential advantages over conventional x-ray based preoperative planning. These include shorter operative times, more accurate implant positioning and sizing, more minimally invasive surgery, and potentially fewer complications due to a more streamlined and simplified operative procedure.



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ERNEST A. EGGERS, M.D.

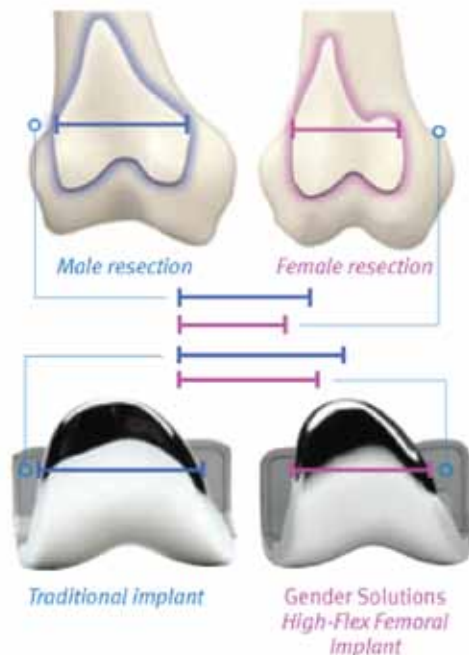


## Special Knee Replacement for *Women Only*

Of the several hundred thousand knee replacements per year in this country, 60% are women. While the results of implants, technology, and surgical technique have improved over the last decade, certain differences have come to light with the female anatomy. There may be variables, including the ratio between the front to back and side to side geometry, as well as the tracking of the patella or kneecap. The actual “thickness” of the metal cap on the end of the thigh bone may need to be less to accommodate a smaller patella

This has lead to the gender specific prosthesis for women. When necessary it provides a better fit and improved tracking of the patella. This is not to downplay good results obtained with conventional knee replacement, but every bit of technological improvement improves the stress on the soft tissues around the joint itself. The Zimmer Orthopedic Company has introduced both a cemented and uncemented alternative, depending upon age, weight and bone density.





New ingrowth surfaces called trabecular metal are being applied to the uncemented knee replacements, thus making their fixation to the bone a more permanent solution. A plastic tray between the upper and lower metallic components can always be changed at a later time with a small operative procedure.



Partial or Uni knee replacement, a procedure available for at least 30 years, has had improved technology and instrumentation. It is available for both men and women. My experience over the last three decades with the Uni knee has shown that results improve with proper selection of patient's. Weight, age and bone density are important.

While traditional partial knee replacement is certainly becoming more popular and successful, a new and probable improved technique is on the horizon. A computer assisted robotic preparation of a knee for partial or Uni replacement has been performed at several centers around the U.S. and Europe. It is the most accurate and fail safe method of partial knee implantation that I have experienced. Minimal bone is removed and postoperative recovery rapid.



In summary the gender specific knee may give many woman an improved fit and patellar tracking, which translates into a better functional result. A partial or Uni knee is now being developed with minimal bone resection, an important factor in women with a tendency to smaller and less dense bone. The computer and robotics may play an important role in accurate placement of knee implants, another product of the high technology world we now live.



# TOTAL KNEE REPLACEMENT:

## The Facts About Gender Differences and Implant Sizing

In recent years there has been much written and discussed regarding the issue of implant sizing in knee replacement surgery. Much of this has stemmed from an aggressive marketing program by one of the larger implant manufacturers. As a result of this marketing, there has been more attention devoted to this issue in lay media than in scientific orthopedic journal and articles. The result is the public dissemination of misconceptions and mistruths about an issue at the very heart of knee replacement surgery.

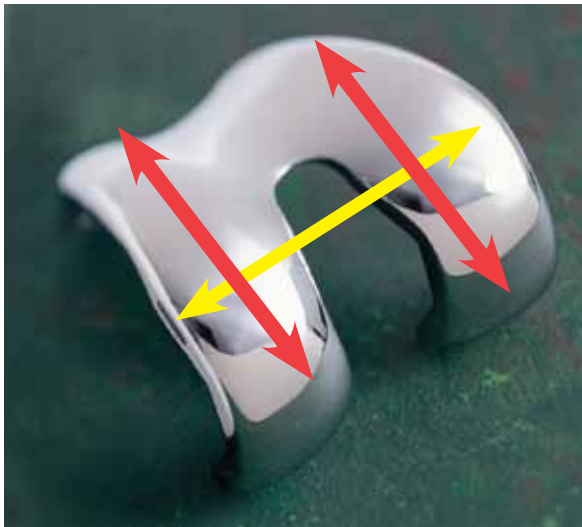
### Historical Perspective

The first routinely successful knee replacements evolved in the early 1980's. At that time manufactures offered implants to surgeons and their patients that did little more than cover the surface of the distal femur and proximal tibia to rid the patient of the painful arthritic joint surfaces. The implants of that era were designed with little understanding of how the knee functioned or moved. Over the next two decades as experience was gained and the science of knee replacement surgery advanced, design improvements followed. Dramatic improvements were made in the design of the patellofemoral joint (kneecap joint). The implant articulating surfaces were contoured to be more anatomic so as to allow for more normal

knee kinematics and greater range of motion. The design of the polyethylene plastic insert that in effect becomes the new artificial cartilage in the knee was altered and more options offered so as to better tighten and balance the ligaments of the knee that control stability and motion. All the while, little attention was paid to actual implant sizing issues. Surgeons recognized that intraoperative compromises were routinely made so as to make the patient's anatomy fit available implant sizes rather than having a specific appropriately sized implant available to fit the patient. And it became clear that the compromises in implant sizing were adversely affecting outcomes. Thus in the late 1990's surgeons began demanding more and better sizing options so as to further improve on an operation that had overall become very successful. Not surprisingly, implant manufactures began to respond to this demand. As a result the last decade has been witness to an explosion of research and subsequent understanding by implant manufacturers and surgeons alike of what is needed in terms of knee implant sizing to best fit patients. Differences in size and anatomy were discovered between the tall and the short patient, between heavy and thin patient, and between female and male patient. And manufactures developed a sizing variety that fit all these "customers".

## The Modern Knee Replacement and Sizing Issues

As a result of the above enlightenment, the last decade has produced knee implant systems are better designed anatomically to allow for improved function and more appropriately sized for body type and gender. It is now known, for instance, that the average female knee is narrower from side to side than that of their otherwise similarly sized male counterpart. And it has become understood that if implants are inappropriately sized prolonged postoperative soft tissue soreness about the knee can result. As these anatomic facts and differences became understood, the major implant manufacturers began one by one to revise their inventory of implant sizes available to surgeons for use in their patients. Implant manufacturing companies have as much as doubled the available sizing inventory. The anterior – posterior (front to back) to medial – lateral (side to side) sizing ratios have been altered to fit both female and male patients of all shapes and sizes. “In-between” sizes are offered. The result is that all major implant manufacturers now offer an array of implant sizes that can appropriately fit all patients of both sexes of all body type.



**Figure 1. Yellow arrow represents the femoral implants side to side width which is on average relatively narrower in the female than male patient. Red arrows represent the front to back height which is on average relatively greater in the female than male patient**

## Choosing the Appropriately Sized Implant for Each Gender and All Body Types

Though preoperative planning based on x-rays and MRIs can be helpful, final decision making regarding individual patient implant sizing occurs during surgery. Each manufacturer has designed a tool used in surgery to best measure the height and width of the knee. After these dimensions are known, the proper implant is selected. For instance, though the average female knee is taller from front to back than it is wide relative to the average male knee, not all female knees are so shaped. The same is true in the reverse for the male knee. Thus instead of selecting the “female knee” for the female patient and the “male knee” for the male patient, in actual practice the surgeon chooses the knee that fits the best no matter what the gender.



**Figure 2. Typical sizing instruments used during surgery to measure the front to back and side to side dimension of the knee.**

## The Era of Marketing (Or Image is Everything)

Two things have changed in the last decade of total knee replacement implant designs. First, all manufacturers have indeed produced implant sizes which now fit the vast majority of patients without forcing the surgeon to make compromises in sizing that could affect the postoperative outcome. Second, in the modern era of hype and marketing, one specific manufacturer has attempted to capture this issue as their own by making unsubstantiated



**Preoperative planning can be helpful, but final decision making regarding individual patient implant sizing occurs during surgery.**

**The average female knee is taller from front to back than it is wide relative to the average male knee, not all female knees are so shaped. The same is true in the reverse for the male knee.**

**Thus, the surgeon chooses the knee that fits the best no matter what the gender.**



claims of superior sizing and design. And instead of following the conventional path of scientifically proving such claims in studies published in the medical literature, this particular manufacturer has instead gone straight to the public with a heavy marketing program bypassing accepted scientific protocols and the surgeons who implant these devices. The results have been mixed. Public awareness regarding issues of implant design has been raised. Most patients however accept their surgeons explanation that an implant manufacturer claiming to have cornered the market on appropriate implant sizing is analogous to a shoe manufacturer claiming to have cornered the market on the size 8 ½ shoe. Or more simply this is just another example of “better tasting vs. better ingredients” advertising that we see in the media daily. The fact of the matter is that despite heavy advertising, the manufacturer marketing their “female” gender specific knee has steadily lost market share since its inception.

### **What is Important to the Patient**

No one implant manufacturer has scientifically demonstrated that their system is more appropriately sized or obtains better results than another. All manufacturers have designed high flexion knees that function well in high demand situations. The biggest differences between implant systems are the instrument systems by which the components are implanted and issues of service by the distributor. It is the development of low profile instrument systems that allow the surgeon to perform the procedure in a minimally invasive manner to allow for a shorter recovery time.

### **Advice to Prospective Knee Replacement Patients...**

Choose your surgeon. Let your surgeon choose you implant. That is the best advice to achieve an excellent long term result to which all aspire.



ERIN EGGERS FIDLER, M.P.T.



## What to Expect After ACL Reconstructive Surgery

Anterior cruciate ligament (ACL) injuries are very common, with as many as 150,000 new tears occurring each year. These injuries usually occur in sports involving contact, cutting and/or jumping but also can occur in falls or car accidents. In some instances reconstructive surgery is required to return an individual to their prior level of function, while other individuals choose not to undergo a surgical procedure. Physical therapy is an integral part of rehabilitating an individual after reconstructive ACL surgery.

### Anatomy

The femur (thigh bone) and the tibia (shin bone) meet to form the knee joint, which is a complex hinge joint. The patella (kneecap) is a small bone that protects the front of the knee. Articular cartilage helps to cushion the joint both behind the patella and between the femur and tibia. The lateral and medial menisci provide further shock absorption for the joint. The primary muscles supporting the knee joint are the quadriceps in the front and the hamstrings and calf muscles in the back. There are many ligaments serving to stabilize the knee. The ACL is a ligament in the center of the knee joint which functions to control anterior (forward) movement of the tibia relative to the femur.



## ACL Injury

ACL injuries occur at times when the ligament is under the most stress. These injuries commonly occur with sports involving cutting and pivoting with sudden deceleration, such as skiing, soccer, basketball, football, and field hockey. When an individual ruptures an ACL there can be an audible pop, often associated with immediate pain and swelling around the knee joint. An athletic trainer or doctor can perform manual testing at the site of the injury to assess the laxity of the ligament. If an ACL tear is suspected the diagnosis can be confirmed with an MRI. At this point the patient and doctor explore the options of surgical versus non-surgical intervention. In patients that wish to return to a high level of activity, particularly a sport involving cutting or lateral movement, ACL reconstruction is recommended.

## ACL Reconstruction

Surgical treatment for ACL tears usually involve arthroscopic reconstruction of the ligament. A variety of tissues can be used for this procedure. A common method involves harvesting the central third of the patella tendon, which is located just below the kneecap and attaches to a bony area called the tibial tubercle. After part of this tendon is harvested, holes are drilled in the femur and the tibia at the attachment sites of the original ligament. The graft is then pulled through the drill holes and held in place with bioabsorbable or metallic screws. This is usually an outpatient procedure. ACL reconstruction surgery is highly successful in returning patients to their desired level of function. Whether a patient is looking to return to simple activities of daily living or to a high level sport, physical therapy is a crucial part of the rehabilitation process.

## Rehabilitation

If the patient and physician choose to proceed with surgery, it is helpful to do some preoperative therapy. The aim is to reduce swelling, maintain

or regain full knee range of motion, and to activate the quadriceps muscles as much as possible. The patient may increase chances of a quicker recovery by working hard on these factors prior to surgery.

Physical therapy is usually initiated within days after surgery to restore range of motion. The patient may or may not be wearing a protective brace at this point, depending on the surgeon's preference. The patient will usually be using crutches immediately after surgery, typically bearing as much weight as tolerated unless otherwise specified by the physician.

## WEEKS 1-2

The early goals of physical therapy are to reduce inflammation and pain and to restore the knee's range of motion. Ice and elevation are important in this early phase, as less swelling leads to decreased pain and increased range of motion. Therapy at this point involves range of motion exercises to restore at least 100 degrees of knee flexion (out of roughly 135-150 degrees, depending on the individual) and full knee extension (0 degrees). The hamstrings and calf muscles should be stretched throughout this phase. It is also important during the first few days to contract the quadriceps muscles as much as possible, as these muscles weaken with decreased weight bearing and swelling in the joint, or effusion. Quadriceps sets and straight leg raises are implemented for this purpose. It is also appropriate to do some gentle weight bearing, or closed kinetic chain exercises, as tolerated.





## WEEKS 2-6

The patient is likely able to bear full weight on the involved leg after the second postoperative week. At least 120 degrees of knee flexion should be obtained, and the patient will be using a stationary bike to maintain flexibility and conditioning. Strengthening exercises for the quadriceps, hamstrings, and hip musculature are progressed as tolerated, always including closed kinetic chain exercises. It is also appropriate to initiate some balance training in the early phases, especially for patients returning to sports. By the end of this stage the patient should have minimal to no swelling or pain. Activities of daily living including walking and using stairs should not be restricted at this point.



## WEEKS 6-12

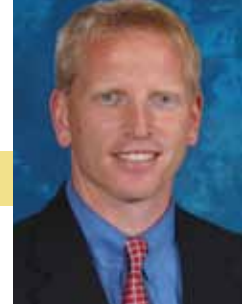
At this point the therapist will begin to add more difficult exercises to the program to prepare the patient to run. These include squats, lunges/walking lunges, single leg press or squats, and eventually single leg hopping. Straight jogging can usually begin at or before week 12 depending on physician preference. In order to progress a running program without pain the patient has to demonstrate good quad and hamstring strength and no effusion.



## WEEKS 12 AND BEYOND

Depending on the individual, this is usually the stage where more agility work can be performed. This will include lateral movement such as side shuffling and grapevine, jumping and landing drills, and eventually cutting drills when appropriate. The strengthening exercises should be continued and progressed per individual. The surgeon will always have the final say regarding return to sports, and it may be 6 months or more for a cutting sport.

These guidelines are general and are always subject to the surgeon's preferences. It is extremely important to ensure complete healing of the graft while avoiding a stiff knee, as well as strengthening the appropriate muscles in a safe but challenging manner. This surgery can be very successful if an individual rehabs appropriately, and collaborated guidance of the surgeon and physical therapist is necessary to this end.



# Tommy John Surgery

If you have followed baseball over the past 15 to 20 years then you are likely to have heard some discussion about the “Tommy John Procedure”. Tommy John was a left-handed professional baseball pitcher for six major league teams in a career that spanned 26 professional seasons. During that time he won 288 games, was on four All-Star teams, and now ranks 7th on the all time list for wins by a left handed pitcher. He also won the 1976 National League Comeback Player of the Year award. Even though he had a remarkable professional career, he is best known for undergoing a revolutionary surgical procedure on his elbow to repair a damaged ligament. In 1974, he was 13-3 while playing for first place Los Angeles Dodgers. Then, tragically, he permanently injured his arm. Until this time, damage to a pitcher’s elbow that involved the ulnar collateral ligament was career ending. Mr. John met with the team physician for the Dodgers, Dr. Frank Jobe, to discuss if any possible intervention could be done to prolong his career. Dr. Jobe then conceived and performed the first ulnar collateral ligament reconstruction of its time. After this surgery, Tommy John went on to play in 14 more seasons, 3 of them earning All-Star selections.

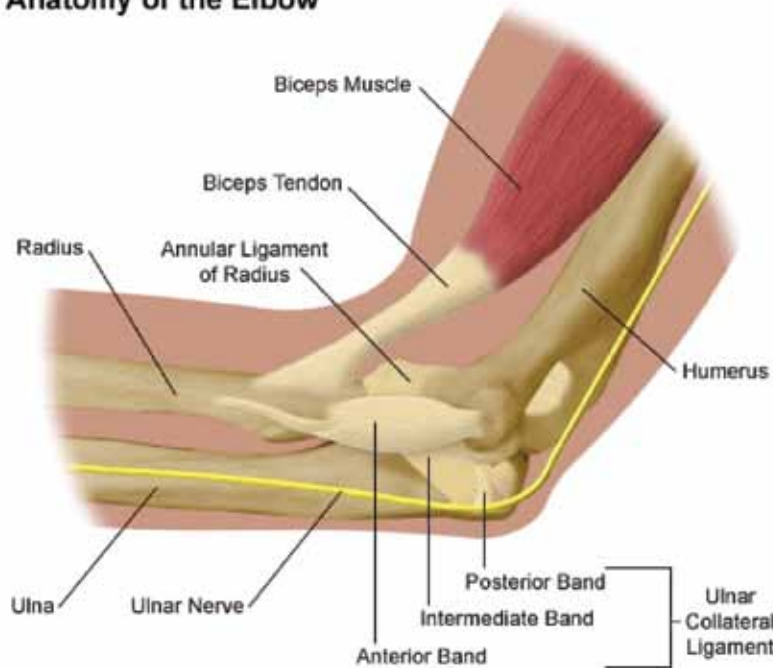
Since then, the “Tommy John Procedure” has been performed on thousands of throwing athletes, from high school to the professional ranks. This surgery (medically known as an ulnar collateral ligament



reconstruction) is performed on the inside, or medial, side of the elbow. (figure 1). A tendon taken from elsewhere in the body (usually the palmaris longus tendon of the forearm) is used to reconstruct the insufficient or torn ligament on the medial side of the elbow. This procedure is a highly intricate surgery that is only performed by sports medicine specialists who have further training and understanding with this reconstruction. Not only is the operation technically demanding, it involves many months of rehabilitation under strict supervision by the surgeon. However, for athletes with ulnar collateral ligament insufficiency this procedure has continued to show improved success rates. The first study done on Tommy John surgical outcomes was in 1986 and it found a 62.5% success

rate of athletes returning to their previous or higher level of performance. Current studies range in the 90% success rate. Several factors have led to improve success, for example, patient selection, surgical technique, and better understanding of the rehabilitation process.

### Anatomy of the Elbow



**Figure 1. Anatomy of the elbow.**

The ulnar collateral ligament is usually injured by tremendously repetitive stresses placed on the inside of the elbow by throwing athletes. This leads to the ligament stretching out (laxity) or actual ligament rupture. Although uncommon, a traumatic rupture of the ulnar collateral ligament is also certainly possible. Baseball is the most common sport associated with this injury, but this injury has affected athletes in football, tennis, softball, javelin, weight-lifters, and many other overhead throwing sports. When this ligament fails, athletes experience pain on the inside of the elbow, especially during throwing activities. This may be associated with numbness and tingling in the fingers, loss of control or velocity in pitches, and a feeling of a “dead arm”. Since throwing a baseball, javelin, football, etc. relies on proper mechanics to maintain velocity and

accuracy, an injury to the lower extremity (e.g. foot or knee) or to the athlete’s back often precedes the elbow injury. When the throwing mechanics are compromised the elbow or shoulder usually ends up bearing the final burden.

For the majority of athletes with ulnar collateral ligament insufficiency, proper physical therapy and adherence to correct throwing mechanics will correct the problem. Time off from throwing is also crucial to allow for healing to occur. If pain and poor athletic performance continues, then an evaluation by a sports medicine surgeon is in order. The diagnosis is usually confirmed by the patient’s history and physical, but an MRI or X-ray is often beneficial. When insufficiency is confirmed, reconstruction may be an option. It is important for athletes, coaches, and parents to realize that this procedure is reserved for those who plan to compete at a high level of athletics

involving repetitive throwing. Furthermore, the post operative rehabilitation from this surgery lasts at least one year. Thus, a significant commitment is required from the athlete to achieve success from the operation. On the other hand, non-throwing athletes rarely notice a loss of athletic performance with ulnar collateral ligament insufficiency and have very minimal, if any, symptoms.

The “Tommy John” is significant advancement of care for athletes and has revolutionized treatment of throwing athletes over the past 20 years. Without it, many of the current pitchers you see on television today would have had their careers ended by injury. If you have any further questions regarding this surgical procedure feel free to contact Dr. Smith. He is fellowship trained sports medicine specialist who trained with Dr. Frank Jobe and served on the medical staff of the Los Angeles Dodgers.





# “Wii-habilitation” at Nazareth Home

AMANDA GREEN, HEALTHCARE THERAPY SERVICES, INC.

The popular Nintendo system’s motion-sensing controller and the wireless balance board are proving to be for more than just virtual entertainment. Though we have seen the Wii become popular in retirement communities everywhere as a way to play traditional sports and stay active, many are experiencing benefits of the Wii and WiiFit in therapy.

Nazareth Home’s therapy department has introduced the Nintendo Wii and WiiFit to their rehab program. “Wii-habilitation” as it’s called,

can be used for persons recovering from joint replacement surgery, fractures, strokes, Parkinson’s or other ailments and injuries. Though it is not a stand-alone program, it is used in conjunction with traditional therapy techniques to get the most out of each therapy session. “Wii-habilitation is a creative adjunct to traditional therapy and offers our clients a more creative and visual experience. The patients look forward to coming to therapy and we have seen an increase in their motivation,” states Cindy Linton, COTA and Rehab Manager.

Persons working on standing and weight tolerance will stand for longer periods of time using the Wii Sports Golf game, than with traditional therapy methods, thus increasing the effectiveness of the treatment. “It increases socialization because they leave therapy and immediately tell their friends about the fun experience.” –Linton. Also, let us not forget about intrinsic competitiveness. We certainly don’t become less competitive as we age. Competition is a large motivator or it can be a pain distracter and increase tolerance for therapy sessions. Wii Sports and WiiFit offer games and activities to help improve:

- Range of Motion
- Trunk Control
- Endurance
- Standing Tolerance
- Eye Hand Coordination
- Weight Bearing
- Weight Shifting
- Posture

Yoga — improves balance, posture and isometric strengthening

Tennis — improves bilateral upper extremity range of motion and eye-hand coordination

Ski-Shalom — For a person who has been non-weight bearing after a hip replacement, weight

shifting is tough to accomplish. The Ski Shalom allows for the person to shift the weight while visually tracking their improvement.

Bubble Game — Persons who have had poor posterior leaning (results in falling backwards) use the bubble game which forces them to shift their weight forward through their toes to create better upright posture.

*Game descriptions and benefits provided by Nazareth Home Occupational Therapist, Angela Augustine, OTR/L*

With the recent addition of Nazareth Home’s sub-acute rehabilitation unit, they have expanded to have two large therapy gyms along with two Wii and WiiFit systems to accommodate the large number of clients. “We now have two Wii systems because they are used every day and everyone wants to use it when they come to therapy. I look to add another Wii system in the next 6 months to a year.” –Cindy Linton, Rehab Manager.

The Nazareth Home Rehabilitation Department continues to monitor progress and increase motivation with the Nintendo Wii gaming system. They also take special care to guard against overexertion, injury, appropriateness as well as following all infection control precautions with the equipment, controllers and balance boards.

For more information about  
“Wiihabilitation”  
or any of the leading therapy  
technology at Nazareth Home,  
contact Cindy Linton, Rehab Manager  
or Brook Wilson, Marketing  
at 502-459-9681.





# X-STOP Spacer

Performed by Thomas R. Lehmann, M.D.

by Peg Nixon

Back and leg pain from lumbar spinal stenosis (LSS) occurs when the space between the vertebrae is reduced, causing bone or tissue to come in contact with the spinal nerve. Most people with LSS get relief from pain when they bend forward or sit down. That's because this position opens the space around the pinched nerve. The X-STOP Spacer uses this principle and can provide sustained relief—even when you stand up straight and walk.

## Lifting the pressure off of pinched nerves relieves pain

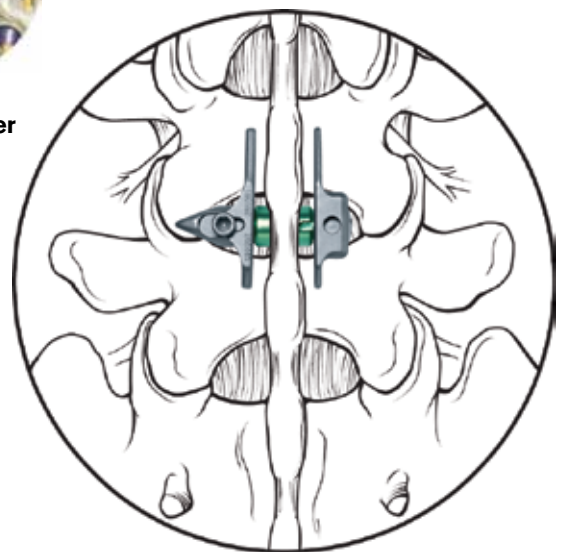
The X-STOP Spacer (figure 1 and 2) is a small implant that fits between two bones in the back of your spine - at the level of the pinched nerve. You can feel these bones, called the spinous processes, when you run your fingers down your spine. Once in place, the X-STOP Spacer can lift the vertebra off the pinched nerve.

## Sustained pain relief—even when you stand and walk

The unique X-STOP Spacer is designed to stay safely and permanently in place without being attached to bone or ligaments, by screws or other hardware, and there's no fusion involved. It works with your spinal anatomy to keep the space around the nerve open - and can relieve your pain and other symptoms - even when you stand up straight and walk. With the X-STOP Spacer you should not need to bend forward to relieve your symptoms.



**Figure 1.**  
**X-Stop Spacer**



**Figure 2.**  
**Posterior view of X-Stop**



The X-STOP Spacer may relieve the kinds of pain and discomfort caused by LSS:

- Dull or aching back pain that travels to your legs
- Numbness and a pins-and-needles sensation in your legs, calves, or buttocks

### Short recovery and rapid pain relief

The X-STOP Spacer is implanted during a short procedure - typically 45 to 90 minutes. In some patients, it can be performed on an outpatient basis and with local anesthesia, which is an especially important benefit for people who should avoid general anesthesia due to their age or other health conditions. However, this is usually performed with general anesthesia and the patient spends the night in the hospital. You and your surgeon will decide what's best for you.

The X-STOP procedure is minimally invasive. It's not like traditional surgery, such as a laminectomy, which removes structurally important bone (lamina) and tissue (ligaments that connect the vertebrae). The X-STOP Spacer preserves your anatomy and your spinal stability. That's why it may offer a short recovery time and a low complication rate. And the spacer is not positioned close to nerves or the spinal column, but rather behind the spinal cord between the spinous processes.

### Is the X-STOP Spacer right for you?

The X-STOP Spacer is indicated for patients aged 50 or older suffering from lumbar spinal stenosis (LSS). A diagnosis of LSS should be confirmed by a doctor with X-ray, MRI, or CT scans. The X-STOP Spacer is indicated for patients with moderately impaired ability to function, who experience relief from their pain symptoms when bending forward. Patients receiving the X-STOP Spacer should have been on a regime of nonsurgical treatment for their symptoms for at least six months. The X-STOP Spacer may be implanted at one or two lumbar levels in patients in whom operative treatment is indicated at no more than two levels. At times this is performed in conjunction with other minimally invasive procedures.

**If you can answer yes to all of the following four statements, you may be eligible for the X-STOP Spacer.**

- I am 50 years of age or older.
- I have been diagnosed with and suffer from the symptoms of LSS.
- My pain is relieved when I sit down or lean forward.
- I have been in treatment for LSS for at least 6 months.

**The X-STOP Spacer should not be used if you have:**

- An allergy to titanium or titanium alloy
- Spinal anatomy that would prevent placement of the device or cause the device to be unstable in your body
- Cauda equina syndrome, which is a spinal nerve compression that causes groin numbness, bowel and/or bladder dysfunction
- Osteoporosis with fragility fracture
- A current infection

### Postoperative Care

The X-STOP Spacer may offer a short recovery, and pain relief may be rapid. You may be able to walk the same day and be discharged from the hospital within 24 hours.

As with any surgery, you may feel some soreness after the procedure. Your doctor will discuss the need for appropriate medications based on your level of discomfort.

Following the procedure, physical therapy may be recommended and your doctor may ask you to return for an examination approximately 6 weeks later. You may also be advised to avoid strenuous activity, but light activities and travel should be okay. Walking is usually acceptable as long as it is comfortable and does not exceed one hour in duration.



Sustained pain relief—  
even when you **stand**  
and **walk**.

You may be asked to limit physical activities such as:

- Bending backward
- Heavy lifting
- Climbing stairs
- Sports like swimming, golf, tennis, racquetball, running, and jogging

Most normal physical activities can be resumed with your doctor's recommendation within 2 to 6 weeks after the procedure. In order to fully recover from the procedure, it's important to follow your doctor's directions carefully.

If you're planning to have other diagnostic procedures (such as an MRI) or treatments, be sure to tell your doctor and dentist that you've had the X-STOP Spacer procedure.

### Possible Complications

Complications that may be associated with the X-STOP Spacer procedure include, but are not limited to, the following: Implant dislodgement (movement out of place); implant not positioned

correctly; fracture of the spinous process; foreign body reaction (ex. allergic reaction); additional surgery, which could include removal of the X-STOP implant; mechanical failure of the implant.

### Conclusion

Patients treated with the X-STOP Spacer demonstrated superior outcomes to patients treated with nonsurgical therapies, such as epidural steroid injections, pain medications, and physical therapy.

It is also important to note that the X-STOP Spacer provided patients with rapid relief of symptoms. Most patients who receive nonsurgical treatment do not experience sustained symptom relief, which means that patients need to continue a regimen of epidural steroid injections, pain medications, and physical therapy to maintain symptom relief.

If you are looking for sustained pain relief, or if you're tired of ongoing treatment and the side effects of pain medications, the X-STOP Spacer may offer an effective alternative to relieve your painful symptoms.



# Total Knee Replacement

The complete knee replacement has been evolving since 1975, and improved dynamics and physical characteristics of the implants along with improved instrumentation have lengthened the expected duration to 15 to 25 years. Navigation or computer assisted technic has been promoted for approximately nine years, and in a number of studies it has not shown to improve functional results. Instrumentation along with the skill and experience of the surgeon still seem to be the common denominators for improved knee replacement.

In the United States 60% of weight bearing joint implants are the knee, and 60% of those are in women. This has led a few companies to improving the design and size parameters of the prosthetics to more approximate the female knee.

## Indications

The vast majority of patient's requiring a complete knee replacement have degenerative or rheumatoid arthritis. Some will have post-traumatic arthritis due to old injury, previous operations, etc. Pain in the knee, limitation of function, and failure of response to conservative treatment such as injections, non-steroidal anti-inflammatories and possibly a cane, are preludes to requiring a joint replacement. Much of the knee is generally involved including both the inner and outer side of the joint, and the patellofemoral or kneecap. Indications for the

partial or hemi knee have been explained in another article. Bone on bone and deformity with bowing or knocked-knee angulation are frequent findings in the patient. Upper age group limits such as the 80's or early 90's are not contra indicated except by the health of the individual.

## Total Knee Alternatives

For many in the United States the gold standards for a number of years has been a cemented implant. I had significant success in the 80's and early 90's with uncemented versions and now this appears to be a returning technology. After the age of 65 or 70 most people can enjoy a long-term result with a cemented implant.



**Trabecular  
metal technology**

Younger and more active individuals with good bone quality may have the uncemented implant that involves special surfaces for ingrowth of the bone. One of these newer joints involves the Trabecular metal technology. This was started seven or eight years ago by the Zimmer Company using tantalum. I have used this many times through the years with





Younger and more active individuals with good bone quality may have the uncemented implant that involves special surfaces for ingrowth of the bone. One of these newer joints involves the Trabecular metal technology.

younger individuals with great success. Now other companies are developing a similar high porosity knee implant with titanium, including DePuy, Biomet and others.

The patient's bone seems to adhere quickly to his surface, and once attached may be a permanent solution to a younger individuals lifespan with a prosthetic knee. While the plastic between the upper and lower metal parts may wear at sometime in the future, this is modular and can be replaced with a very limited operation.

The rotating platform is another very successful type of knee implant that can be performed with or without cement in younger more active and athletic patients. The ability of the polyethylene tray to swivel slightly between the two upper and lower metal parts seems to give more improved wear characteristics as well as function in some.

### The Gender Knee

Sixty percent of all knee replacements are performed in women. Considerable tension over the last

several years has been applied to the function and geometry of the female knee. There are differences not only in sizing, but in tracking of the patella or kneecap. These have been well addressed by the Zimmer Company.

While an excellent result can be achieved with any of the traditional knee implants, with good surgical technique and alignment, the gender or female knee appears to be an added attraction to the surgical expertise. The appearance of the x-ray and the tracking of the kneecap can increase the surgeon's decision making process.

### Conclusion

Over the last number of years we have made vast improvements in total knee replacement. Improved instrumentation, the rotating platform, the gender or female knee and the new ingrowth surfaces of Trabecular metal have given the surgeon a greater array of successful operations. Though we may not have quite the permanent solution as in the hip, it may be close.



# PHYSICAL THERAPY 101

Why should I attend Physical Therapy? Is it necessary? What is Physical Therapy? I have heard many fears and reasons not to attend physical therapy over the years. “I’ve seen grown men cry” and “if you aren’t crying you’re not trying” come to mind. The most popular is P.T. stands for “physical torture” or “physical terrorist”.

Most people fear the unknown. I would like to settle those fears and explain to you the importance of attending physical therapy and why you should take advantage of physical therapy services. I would like to start by saying that not all injuries, pain, or surgeries are the same. With that said, all physical therapy experiences are not the same.



Physical Therapy starts with an evaluation of the injury and/or problems that need to be treated. Upon the completion of the evaluation the physical therapist will develop a treatment plan and/or identify the appropriate physician protocol to follow after surgery to meet your needs. In my opinion, the most important thing a physical therapist should

do is educate you about your injury or surgery. Not in medical terms, but in language that is easy for you to understand. Having an understanding of what the problem is or what procedure was performed helps you understand the problem and what treatment will help you.

The treatment will help decrease pain, increase range of motion and strength, and improve function with activities of daily living, work, or play. It will also help you learn which activities trigger pain and how to decrease them, or how to protect the surgical intervention. The therapist will develop a home exercise program to further your activity level and prevent further

injuries. The treatment progression always takes into consideration your problems, questions, and level of comfort. Pain is a relevant response different to each individual. What is painful for some may not be for others. Pain is difficult at times to manage because you can’t see it or touch it, you can only feel it.

The therapist will identify the cause of pain like muscle spasms, tight muscles, or inflammation, and use modalities to decrease the symptoms. Modalities commonly used in outpatient physical therapy clinics are electrical stimulation, ultrasound, manual therapy, therapeutic exercise, gait training, and iontophoresis.

Electrical stimulation uses electrical impulses to decrease pain, spasm, swelling, and increase a muscle's ability to contract, and improve blood flow/circulation to aide in healing.

Ultrasound is a form of deep heat using sound waves to heat deeper tissues than you would get with a heating pad. This is effective to help with pain, stretching, range of motion, and with decreasing inflammation.

Manual therapy encompasses a variety of hands on techniques by the therapist. It includes, but is not limited to, joint mobility which helps with range of motion. Soft tissue mobilization/massage is used to decrease pain, spasm, adhesions with scar

management, and increase flexibility. Manipulation or positional release techniques are used to improve joint mobility and improve joint/spinal alignment. Trigger point techniques can also be used to decrease pain, and may vary by therapist training.

Therapeutic exercise is the exercise a therapist will prescribe for you to address your needs. The exercises will vary from simple stretching exercises to increase flexibility, or passive exercises to increase range of motion. Strengthening exercises are specific to your areas of weakness and will isolate specific muscle groups to increase strength. As you progress with strengthening exercises, the therapist will increase the intensity of the exercise to prepare you for returning to work or sports often mimicking the activities you perform on a daily basis. Most exercises work in straight planes in line with the body. However, most often with work or sports, we use our muscles in a diagonal plane. For instance, reaching across our body or twisting motions. The therapist will work with you on dynamic strength, exercising through these diagonal planes to help you prepare for your daily needs. These exercises will help develop coordination of the muscles that surround the joint.





A woman with long dark hair, wearing a white tank top with blue trim and light blue pants, is sitting on a blue mat. She is leaning forward, reaching her hands towards her feet, which are extended straight out in front of her. She is smiling at the camera. The background is a bright, out-of-focus indoor space, possibly a gym or a studio. On the right side of the image, there is a vertical green bar.

Therapeutic  
exercises can vary from  
**simple stretching**  
to increase flexibility,  
or passive exercises to  
increase range of motion.

The muscles around a joint must work together to perform properly. For example, if you have three horses and hook them to a wagon, and the horses go in different directions, the wagon will not go forward and will not work well. You have to train those muscles to work together as you would the horses. This will allow for proper joint mechanics and maximum muscle strength to minimize risk of pain or injury.

Gait training is instruction to walk with a normal heel-toe sequence. Most often, with a lower extremity or back problem, the person limps not putting full or equal weight on both legs. The therapist will work to correct the gait sequence and promote normal walking. Often times limping will cause other problems or pain of the hip or back if not corrected. A significant number of people limp even after the original problem is resolved. They have limped so long that it has become more normal or has become a habit for them to do so. The therapist will give them techniques to promote a normal gait pattern.

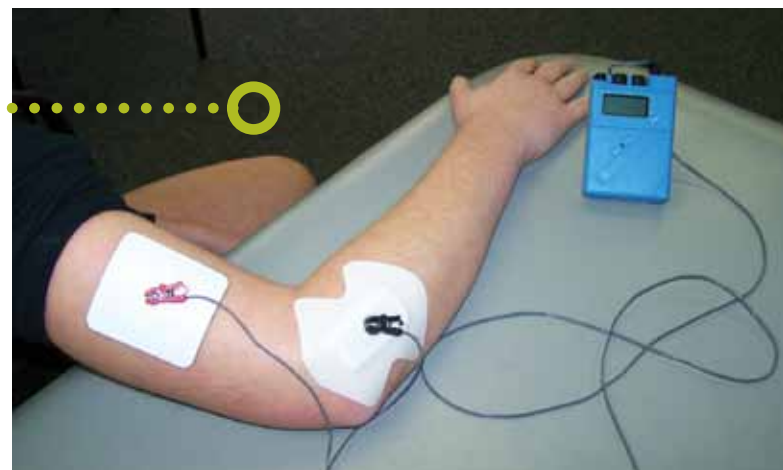
Iontophoresis is most commonly used to treat an inflammatory problem. Dexamethasone is a medication used to treat inflammation. Iontophoresis is used to drive the medication through your pores down to the area to be treated instead of injecting the area. Iontophoresis, as a simplified example, uses two patches, one has the medication on it and the other completes the circuit. Remember back in chemistry class that like “charges” repel each other. When you try to put two magnets together they push each other away. This is how iontophoresis works. The Dexamethasone is a “negatively” charged drug so a “negative” electrode is connected to the patch with the medicine. Iontophoresis is generally used to treat plantar fasciitis, tennis elbow, patellar bursitis, and rotator cuff tendinitis.

There are many other modalities used in physical therapy to help address your needs. The physical therapist will decide what is best for your needs

and will use the appropriate modalities to promote healing and the progression of your treatment. The therapist will work with you like a coach helping you to achieve your goals. The therapist uses his/her knowledge to help guide and instruct you in the appropriate treatment program to achieve your goals. Decreasing or relieving pain is always the ultimate goal.

The therapist will also work with you to increase flexibility and range of motion, which is very important following surgery. The therapist’s knowledge and familiarity with the physician’s surgical procedure and postoperative protocol will help guide you to obtain the maximum range of motion, strength, and function protecting the surgical intervention. Once you have improved your range of motion, the therapist will initiate strengthening exercises. The therapist will identify the appropriate exercises for you, per the surgery protocol, to protect the surgical intervention. It is important for the therapist to monitor your progress and activity level for you to achieve your goals and reach your maximum functional abilities.

Going to physical therapy gives you the greatest opportunity to learn about your problem/injury or surgery, the guidance and treatment to return to your normal activities, and how to prevent further injuries. Take advantage of the opportunity to improve your quality of life and return to your normal activities when your physician refers you to physical therapy.





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# Stimulus 101

## *The \$46 Billion healthcare IT reward and how your practice can benefit*

BY LEIGH BURCHELL

When President Barack Obama signed the American Recovery & Reinvestment Act on Feb. 17, 2009, his primary goal was to stimulate the lagging U.S. economy. But by signing the “Stimulus bill” into law, Obama also provided the means for every physician in America to affordably enter the digital era of medicine by implementing an Electronic Health Record (EHR).

The health IT component of the legislation – the HITECH Act – appropriates a net investment of \$19 billion to encourage healthcare organizations to adopt and effectively utilize Electronic Health Records (EHR) and establish regional health information exchange networks, all while ensuring that the systems deployed safeguard critical patient data.

The Act represents an enormous opportunity for healthcare providers. After decades of slow but steady progress towards converting our paper-based record system into an electronic one, we are taking a monumental leap forward. The Congressional Budget Office predicts that in a matter of just a few years, 90 percent of physicians and 70 percent of hospitals will be using a comprehensive, robust EHR. As a result, the country will save \$28 billion on the provision of healthcare, and our citizens will receive better informed care from a coordinated network of providers.

But just what does the new law mean for physician groups? How can you take advantage of the billions in new funding that will be available as early as 2011? And what will happen if you fail to seize the opportunity presented by the new law?

### Details of the \$19 Billion

There are two portions of the HITECH Act – one providing \$2 billion immediately to the Department of Health & Human Services (HHS) and its sub-agency, the Office of the National Coordinator for Health IT (ONC), and directs creation of standards and policy committees; a second that allocates \$46 billion that will be paid to healthcare providers who demonstrate use of Electronic Health Records. The net cost to the Federal government is anticipated to be \$19.5 billion after savings are achieved through efficiencies, tax revenue and Medicare fee reductions for non-adopters.

In the law’s first section, the Secretary of HHS is directed to spend \$300 million of the \$2 billion fund to establish more health information exchange (HIE) initiatives across the country, as well as helping existing HIEs to progress in connecting providers electronically. Additionally, the Act allocates \$20 million to ensure that health information standards are consistent in all settings.

Beyond those guidelines, the Act does not assign specific dollar amounts to other programs. The incoming Secretary will announce how the remaining funds will be allocated by early summer. Areas singled out for investment include:

- further developing standards related to interoperability and privacy
- establishing a Health IT Research Center and regional Health IT Extension Centers to provide information to healthcare providers on best practices, vendor selection, implementation, training, etc.
- building infrastructure for the advances of telemedicine
- expanding health IT in public health departments
- providing funding for federal grants via the Agency for Healthcare Research and Quality (AHRQ), Health Resources and Services Administration (HRSA), Centers for Medicare and Medicaid Services (CMS) and the Centers for Disease Control and Prevention (CDC), as well as grants to states and state-designees that will help healthcare organizations with upfront funding for EHRs and HIE

The second part of the Act calls for incentive payments to physicians and hospitals for those demonstrating Meaningful Use of an EHR. The government is focused on two primary goals in this legislation: first, moving physicians who have been slow to adopt EHRs to a computerized environment, and secondly, ensuring that patient data no longer sits in silos but instead is actively exchanged between providers to ensure that patients receive informed care.

The majority of the funds within the HITECH Act are for payments that will reward physicians and hospitals for effectively using a robust, connected EHR system. There is a program designed for those that see large volumes of Medicaid patients, and another for those that accept Medicare, and in order to qualify for the incentive payments, both physicians and hospitals have to demonstrate “meaningful use” of an EHR by proving three things:

1. Use of an EHR with ePrescribing capability that meets current HHS standards

2. Connectivity to other providers to improve access to the full view of a patient’s health history
3. Ability to report on their use of the technology to HHS, along with a set of quality care measures

Meaningful Use will be further defined by the end of 2009 and will be an iterative rule, with the requirements for 2011’s incentives anticipated to be less stringent than those of 2013, or then 2015.

Importantly, because the government wants to spur quick action, all of the incentives include payments for up to five years, but provide the largest payments early in the program. The incentive payments begin in 2011 to ensure providers have time to adopt and learn to use the EHR. Physicians who fail to adopt an EHR may eventually be penalized through lower Medicare payments beginning in 2015.

### Specifics of the Physician Opportunity

There are two separate incentive programs for physicians: one provided by Medicare and another by Medicaid.

An orange rectangular graphic with white text and a logo. The logo at the top right is a stylized 'A' shape. Below it, the word 'Allscripts' is written in a large, white, sans-serif font. Underneath the logo, the text 'Allscripts is the clear leader' is written in a smaller white font. Below that, a paragraph of text reads: 'The new Allscripts is the clear leader in software, services, information and connectivity solutions that empower physicians and other healthcare providers to deliver best-in-class patient safety, clinical outcomes and financial results.' At the bottom, there is a bulleted list of four items: '› Electronic Health Records', '› Electronic Prescribing', '› Practice Management', and '› Revenue Cycle Management'. At the very bottom, the website 'www.allscripts.com' and the phone number '888.672.3282' are listed in white.

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- **Medicaid:** If more than 30 percent of a physician's patients pay with Medicaid (20 percent for pediatricians), then they are eligible for payments of up to \$64,000 over five years. The incentives will be calculated through a formula that factors in the exact Medicaid mix of their patients, as well as amounts ranging from \$35,000 in the first year to \$10,000 in subsequent years. Additionally, nurse practitioners and nurse mid-wives are eligible for the same incentives.
- **Medicare:** Physicians who do not have a large Medicaid volume but do accept Medicare can earn up to \$44,000 over the five years based on a calculation of submitted allowable charges multiplied by 75%, up to the cap for the year. Additionally, physicians operating in a "provider shortage area" will be eligible for an incremental increase of 10 percent, though those delivering care entirely in a hospital environment, such as anesthesiologists, pathologists and ED physicians, are not eligible for incentives.
- **Fee reductions:** Providers who do not demonstrate meaningful use of an EHR by the end of 2014 will see, in their 2015 fee schedules from Medicare, a decrease of 1 percent. An additional decrease will be affected in 2016 and 2017 down to a total of 97 percent of the regular fee schedule. The Secretary of HHS can reduce the fee schedule even further, by a maximum of 5 percent beginning in 2018, if the nationwide EHR adoption rate remains below 75 percent.

and implementation specifications. All of this must be completed before the end of 2009.

Finally, as part of the HITECH Act, a very strong emphasis was placed on further protecting patient health information under Federal privacy and security laws (HIPAA). Primary changes included defining which actions constitute a breach (including some inadvertent disclosures); imposing restrictions on certain disclosures, sales, and marketing of protected health information; requiring an accounting of disclosures to a patient upon request; authorizing increased civil monetary penalties for HIPAA violations and granting authority to state attorneys general to enforce HIPAA violations.

What's the bottom line for physician groups? Industry experts agree that, to gain maximum financial incentives, groups need to begin planning the rollout of EHR systems as soon as possible. While many of the details of the legislation remain to be worked out – including the complete definition of a "meaningful electronic health records" – providers can't afford to wait for all the details to be ironed out before moving forward. To gain the maximum amount of Medicare and Medicaid incentives, physician groups must have a qualifying records system in place by 2011. Bottom line: If you want to be at the front of the line to collect those incentive payments and move your practice onto the electronic healthcare highway, the time to start driving is now.

	Amount They'll Receive Each Year						
Year EHR use is first demonstrated	2011	2012	2013	2014	2015	2016	TOTAL
2011	\$18,000	\$12,000	\$8,000	\$4,000	\$2,000	\$0	\$44,000
2012	\$0	\$18,000	\$12,000	\$8,000	\$4,000	\$2,000	\$44,000
2013	\$0	\$0	\$15,000	\$12,000	\$8,000	\$4,000	\$39,000
2014	\$0	\$0	\$0	\$12,000	\$8,000	\$4,000	\$35,000
2015 or Later	\$0	\$0	\$0	\$0	\$0	\$0	\$0

## Standards, Certification and Privacy Expansion

The Secretary of HHS is required by the Act to review all existing standards, determine the initial set of standards that will apply to the "meaningful use" criteria for product certification,

*Leigh C. Burchell is Director of Government Affairs for Allscripts. More than 150,000 physicians, 700 hospitals and nearly 7,000 post-acute and homecare organizations utilize Allscripts solutions to improve the health of their patients and their bottom line. For more information on how the Stimulus law affects physicians, visit [www.allscripts.com/thetimeisNOW](http://www.allscripts.com/thetimeisNOW).*

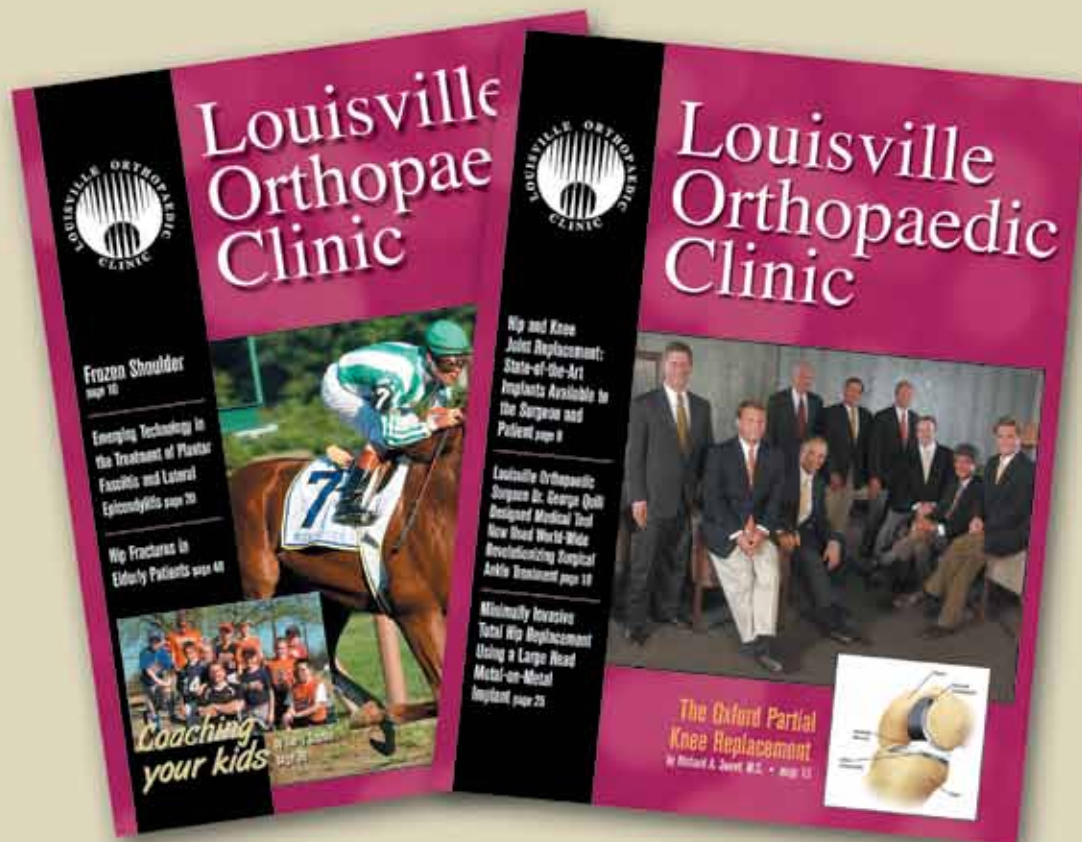
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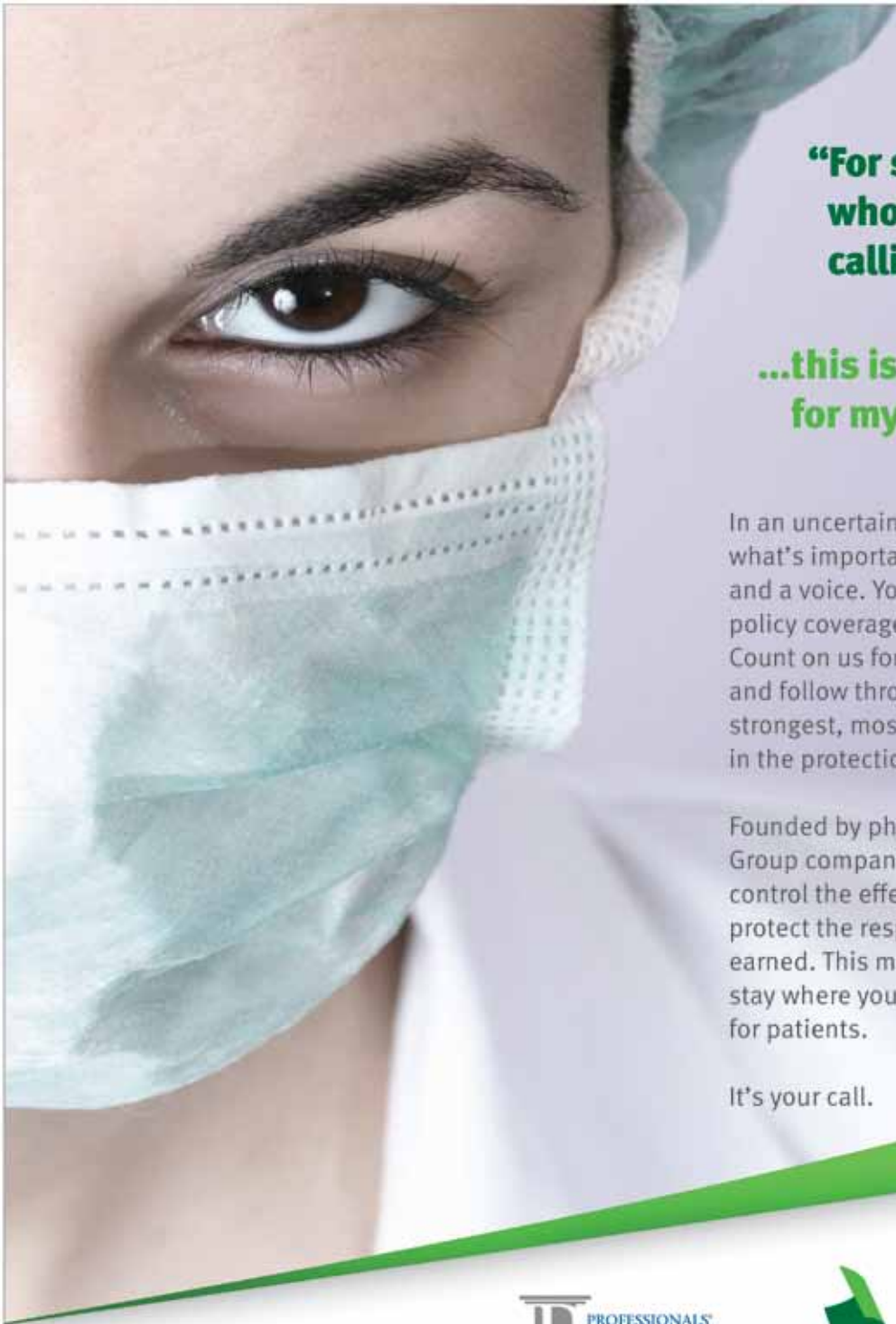
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