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Supporting New Surgical Solutions: A Personal Perspective

When Sy Flug could no longer jog, play golf or even walk without extreme pain in his hip, he knew the time had come to do something about it.

Mr. Flug had previously met with Thomas P. Sculco, MD, HSS Surgeon-in-Chief, at the recommendation of a neighbor who had heard of the excellent work in hip replacement being performed at the Hospital. "His business partner had such a terrific experience with his hip replacement at HSS that he told me, 'this is the place for you,'" says Mr. Flug, formerly Chairman of the Board and Chief Executive Officer of Diners Club.

Dr. Sculco advised Mr. Flug that he would be a candidate for a hip replacement. "I waited for Dr. Sculco to tell me when he'd schedule surgery, and, instead, he said, 'we'll do it when you are ready.' He was right... I wasn't ready then."

Finally, when the pain became progressively worse, Mr. Flug called Dr. Sculco, and they set a date for surgery. A bit apprehensive, he wanted to be sure that he would still be able to navigate the steps in his duplex apartment. "Dr. Sculco said not to worry," recalls Mr. Flug. "Incredibly, I had the operation on a Monday, and on Tuesday I was going up and down steps in the Hospital's rehabilitation room!"

Mr. Flug describes his surgical experience as nothing short of amazing. Anticipating pain following the operation, he says he

never even required pain medication. By Thursday afternoon, he was walking in his neighborhood. "Dr. Sculco asked if I was using the cane he had provided, and I had to admit I wasn't," he says. "He told me to please use it, if for no other reason than to keep people from bumping into me. I spent the next few days walking with the cane, but for the most part, I held it under my arm." Mr. Flug returned to normal physical activity within weeks, and credits the dedication and expertise of the HSS staff for his quick and complete recovery.

Today, a generous contributor to the Hospital's arthroplasty programs, Mr. Flug still marvels over the ease with which he recovered from his surgery five years ago. "I think if I had had a tooth extracted, I couldn't have recovered faster," he laughs. "I suppose if they had had steps in the operating room, I might have just stepped off the table and started walking!"

Mr. Flug's support makes possible continued excellence by HSS physicians and researchers in a number of areas that will advance the field of joint replacement. This includes work by a team of orthopedic surgeons, rheumatologists, and basic scientists to address wear debris and loosening of implants at the mechanical, cellular, and biological levels.

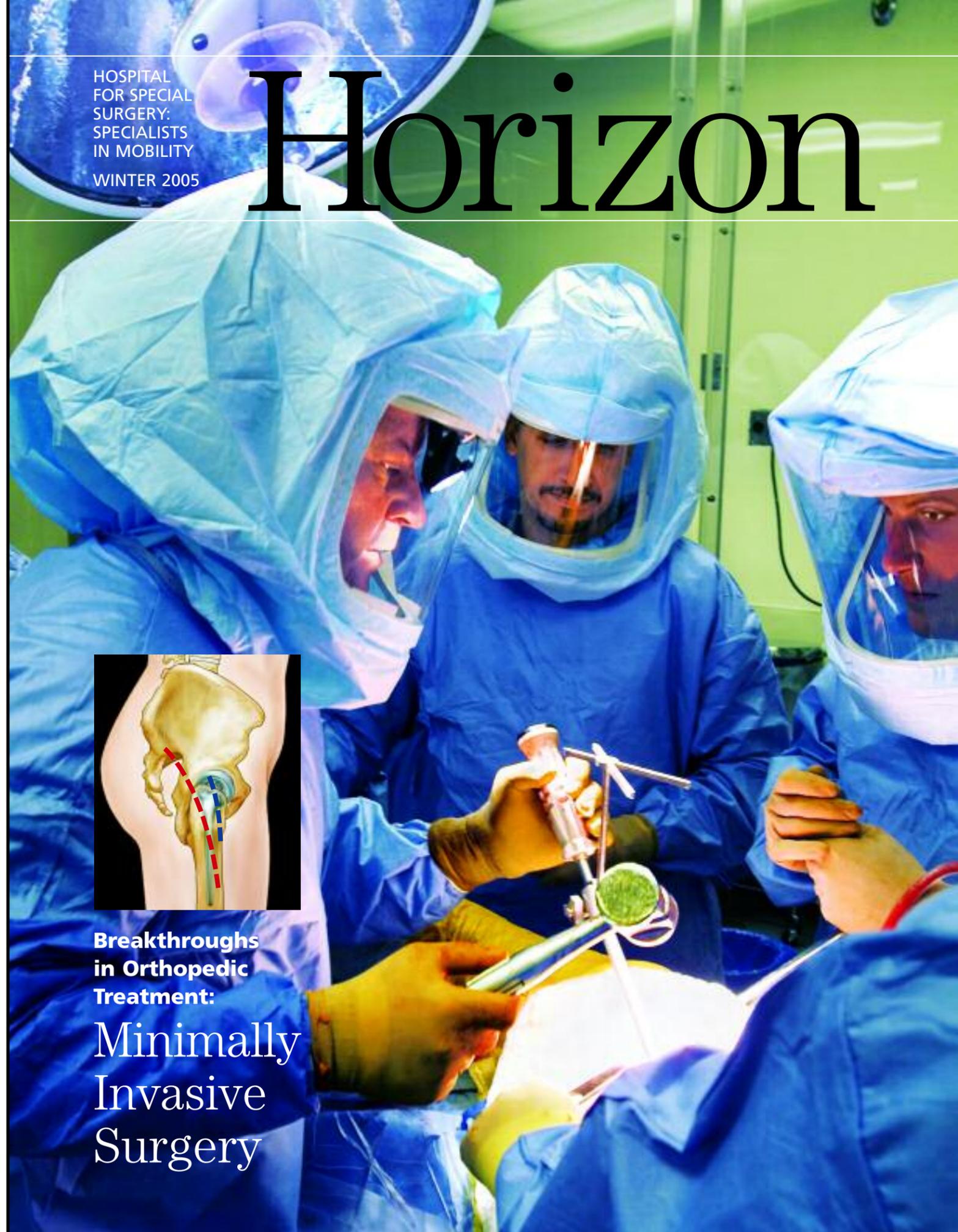
Mr. Flug began his career as a C.P.A. He joined Diners Club as Treasurer and rose to Chairman of the Board before selling the company to Citigroup. He is now a Director and Senior Advisor to Integrated BioPharma, Inc., a biotech and pharmaceuticals company.

"Over the years, I've gotten to know the doctors and staff at HSS," notes Mr. Flug, "and they are just outstanding people. This place is really special. It's a remarkable institution." ■



Bicycling is only one of many activities Sy Flug could return to after having his hip replaced at HSS.

Horizon



**Breakthroughs
in Orthopedic
Treatment:**

**Minimally
Invasive
Surgery**

Minimally Invasive Techniques: Applications to Orthopedic Surgery

Joint Replacement

Minimally invasive approaches are becoming successful alternatives to conventional joint replacement surgery. “Avoiding excessive trauma to healthy tissue is a key advantage of smaller incision hip and knee implant procedures,” says orthopedic surgeon Douglas Padgett, MD. Smaller instruments are used to position the prostheses through an incision that can be 3 to 4 inches long, rather than the standard 12 inches in knee surgery, or, in the case of mini-incision hip surgery – 4 to 5 inches versus the former 10-inch incision.

Ultimate pain relief and mobility appear equal to that achieved through the traditional incision length, with the added potential benefits of less blood loss during surgery, less post-operative pain, and an easier rehabilitation period. Longer term follow-up studies are being performed to confirm the safety of these newer procedures.



A tool (at left) used to prepare the bones during hip surgery was redesigned to have a curved neck to minimize soft tissue disruption.

Hip Arthroscopy

Arthroscopic surgery of the hip involves several small incisions about the joint and the insertion of an arthroscope to directly visualize internal structures. According to HSS orthopedic surgeon Struan H. Coleman, MD, PhD, indications for hip arthroscopy include loose bodies present within the hip joint, such as those that occur after traumatic injury; labrum tears around the hip joint; instability of the hip joint; and synovial disorders.

Pioneering a new procedure, HSS orthopedic surgeon Robert L. Buly, MD, applies arthroscopy rather than major open surgery – the current approach – to treat a disorder in young adults caused by impingement between the neck of the femur and the rim of the hip socket, which can lead to labrum tears and possible early degenerative arthritis. HSS is one of the few places where this minimally invasive approach is performed.



Hip replacement surgery can now be performed through a smaller incision even though, once inside the joint, the implant procedure remains the same.

Spine Procedures

Innovative image guidance and minimally invasive technologies are changing spine surgery for degenerative disk disease. “There are two areas where we are doing minimally invasive surgery,” says Frank P. Cammisa, MD, Chief, HSS Spine Service. “In the first instance, when fusion is indicated, we are able to avoid doing a bone graft by utilizing bone growth factors. The second development involves disk replacement, where – instead of fusing the disks – we replace the diseased disk with a prosthesis, enabling us to preserve the patient’s motion.”

“New computerized image guidance systems are helping us to see every possible structure inside, allowing us to make a smaller and safer incision,” notes Federico P. Girardi, MD. Minimally invasive spine surgery is also used to stabilize compression fractures of the vertebrae, for biopsies by radiologists, and to remove some benign tumors.

Shoulder Arthroscopy

The majority of repairs and reconstructions for shoulder problems are today performed arthroscopically. Using the scope, a surgeon can evaluate the entire shoulder joint and can usually treat the conditions through very small incisions with specially designed instruments. Says Frank Cordasco, MD, “We are able to get at the injury from the inside out, in contrast to approaching it from the outside in. This allows the patient to recover more quickly and decreases the post-operative pain associated with open approaches.”

“Improvements in instrumentation allows us to avoid disruption to the muscle, place sutures arthroscopically into the bone, and then pass the suture through soft tissue,” notes Scott A. Rodeo, MD. “Arthroscopic surgery achieves excellent results and enables the patient to regain range of motion more quickly without shoulder stiffness.”



The arthroscope is a pencil-sized instrument containing a small lens and fiber-optics lighting system to magnify and illuminate internal joint structures.

Orthopedic Trauma

With orthopedic trauma, the goal of minimally invasive procedures is the same as traditional surgery: properly healed bones with less complications. Less invasive approaches are being developed with the percutaneous (through the skin) insertion of newly designed fixation plates and screws to minimize disruption of the blood supply to the bone and lessen soft tissue injury. This in turn leads to improved fracture healing and a quicker rehabilitation for patients.

“The key to being able to use minimally invasive techniques is to first reduce the fracture – you want to straighten the bone and correct the alignment and length,” says David L. Helfet, MD, Director, Orthopedic Trauma Service. “Under image guidance, you can then use the plate to further reduce and definitively stabilize the fracture.”



A miniaturized instrument, light source and video camera combination enables surgeons to perform a complicated tendon repair in the shoulder arthroscopically.

Minimally Invasive Surgery: New Perspectives on Orthopedic Treatment

Orthopedic surgeons at Hospital for Special Surgery are known for their ingenuity and innovations to ever improve treatments for their patients. In the last several decades, they have helped transform surgical care for disabling arthritis, career-threatening sports injuries, and countless other musculoskeletal problems.

In recent years, the pacesetter work of HSS has involved the development of less invasive methods to perform orthopedic procedures. Today, HSS surgeons operate through shorter incisions and with fewer consequences to healthy tissue for a broad range of orthopedic conditions – from disabling joint problems, to sports injuries and spinal disorders, to musculoskeletal trauma.

HSS orthopedic surgeons are adapting these less invasive approaches to knee replacement and hip replacement procedures, resulting in post-operative recoveries that are less painful for patients and convalescences that are quicker. These pioneering procedures are not for every patient, however, and individuals are carefully screened to determine if they are candidates.

Although the most noticeable evidence of minimally invasive techniques is the smaller incision through which they are performed, the real value of these innovative procedures must lie within. Since the sizes of the prostheses have not changed, once the surgeon is inside the joint, the same preparations of bone and muscle must be taken to properly place and position the implant.



Steven Haas, MD, began exploring the value of minimally invasive total knee replacement about three years ago, and developed instruments smaller than and just as accurate as the instruments traditionally used.

A Novel View on Knee Replacement

The decision by HSS orthopedic surgeons to consider modifying the standard approach to total knee replacement surgery had its origins in concerns about post-operative pain and recuperation. Three years ago, Steven Haas, MD, Associate Chief of the HSS Knee Service, began performing total knee replacement surgery using smaller instruments which allowed him to make a shorter surgical incision and use a surgical approach that involved less trauma to the surrounding knee tissue.

Richard S. Laskin, MD, Co-Chief of the HSS Knee Service, describes the process as evolutionary. “Over the last 30 years, total knee replacement has been extremely successful, so we knew we didn’t need to re-invent the procedure,” he explains. “We asked ourselves, ‘Has there been any part of knee replacement that hasn’t been as good as we would like?’” The answer came directly from patients, who repeatedly told their surgeons that rehabilitation was painful, long and tedious. So HSS orthopedic surgeons proceeded to look at ways of maintaining the same good results achieved from the standard approach, but improving

On the cover: Newer procedures for hip replacement surgery, performed here by Bryan Nestor, MD, HSS orthopedic surgeon, hold important benefits for patients. Says Dr. Nestor, “The trend toward minimally invasive approaches helps to push other innovations, and that’s a good thing.”



Less than five weeks after bilateral, minimally invasive knee replacement surgery, Elizabeth Phillips was back at work and already able to walk the one and a half mile Central Park reservoir path – something she had not done in over a year. Today, she continues to pursue her interest in marathons.

upon the concerns voiced by their patients.

“To do total knee replacement you need to view large areas of the knee and muscle,” says Dr. Laskin. “If we could find a way to visualize the knee without damaging as much muscle, then perhaps the patients would have less pain and obtain more motion.” Enter the concept of a “movable window,” a term applied to an incision in the skin which can be moved as need be to expose the area in question.

A Personal Best

By the time Elizabeth Phillips came to see Dr. Haas, both her knees were severely damaged by arthritis. An avid marathoner, Ms. Phillips has been entering races since the 1970s. “In those days, running shoes did not exist. I ran my early marathons in sneakers from Woolworth’s. When someone asks me, ‘what made your knees so



“Our mission is to constantly improve upon standard methods of surgery,” says Dr. Richard Laskin. “Less invasive procedures promise to be of enormous benefit to patients.”

bad?’ I trace it to back then.”

Prior to meeting with Dr. Haas, Ms. Phillips had learned about minimally invasive knee replacement and felt that, given her activity level and desire to return to her work as quickly as possible, it was the only way to go.

On May 14, 2004, Dr. Haas performed the procedure on both her knees. Within a month, Ms. Phillips was checking out – although not competing – the route of another mini marathon, walking right to the finish line, canes and all.

“I was thrilled,” she said. “Before surgery it was an effort to go four blocks. I’d walk to a bus stop and look for a fire hydrant to sit down on because I couldn’t stand for more than a minute.”

Ms. Phillips is not alone in her extraordinary results. Patients of Drs. Laskin, Haas, and their colleagues repeatedly bask in

the freedom provided by new knees and the ease of recovery made possible by the newer, less invasive techniques.

“Traditionally, knee replacement was done through incisions that were about 8 to 12 inches long,” notes Dr. Haas. “Then, to get exposure to the knee, you would need to turn the kneecap.” Older instruments combined with technical aspects of the procedure were forcing surgeons to operate through this large incision. The new tools and techniques avoid this. “The implants are the same, but now we can do less cutting to the soft tissues deep around the knee,” adds Dr. Haas. “We can spread the muscle instead, and slide the kneecap out of the way. This avoids twisting of the tendons.”

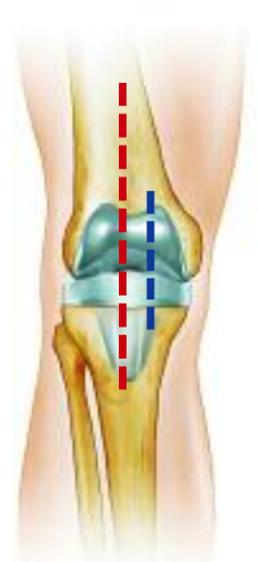
For patients, post-operative pain is much less and, on average, recovery is six weeks faster. Because there is less scarring, patients also achieve greater range of motion overall. In addition, Dr. Laskin published in *Clinical Orthopaedics and Related Research* an HSS study showing a decrease in need for pain medications of up to 35 percent. “Furthermore, by one month after surgery, nearly all can come off the cane,” says Dr. Laskin, “and most can go up and down the stairs foot over foot. In the old days, those wouldn’t be achieved until three to four months out.”

Hip Replacement: Setting New Standards for Surgery

At age 48, Glenn Borsky is young to be a hip replacement candidate. But when he was 29, a congenital condition of his left hip began to worsen and, throughout his thirties and forties, pain dominated his life, and he walked with a constant limp. Mr. Borsky found it progressively difficult to get around; the simple act of getting in and out of a car was excruciating.

“Even lying in bed was agonizing,” said Mr. Borsky. “I couldn’t get comfortable.”

Mr. Borsky set about finding a surgeon who would be able to relieve his pain and restore his mobility. His search produced Bryan Nestor, MD, at HSS. An orthopedic surgeon experienced in both the standard



Before HSS orthopedic surgeons began to apply the concepts of movable window and smaller-incision knee replacement surgery, incisions were 8 to 12 inches as shown here in red. With the new approach, they can be half that length.



Dr. Thomas Sculco says the goal of minimally invasive surgery is to preserve the integrity of a patient’s anatomy without compromising the surgical outcome.

and mini-incision hip replacement techniques, Dr. Nestor determined that Mr. Borsky, who was otherwise in good health and physically fit, was a candidate for the latter approach.

According to Dr. Nestor, the history of the mini-incision approach – not just at HSS, but nationally – can be traced to a conversation in the OR between Thomas P. Sculco, MD, HSS Surgeon-in-Chief, and an orthopedic resident during a traditional hip arthroplasty some six years ago. “As he relates the story,” says Dr. Nestor, “a resident assisting him asked ‘why is the incision so long when we are not using the lower three inches of it?’” It was this observation that led Dr. Sculco and his colleagues to determine if they could shorten the incision and still realize the same, if not better, results.

A pioneer in the field, Dr. Sculco has not only developed the modified technique for hip arthroplasty, but also the customized instrumentation to lessen the trauma to the tissue. These include a reamer that is used to prepare the bones for the implant, which is now angled so it can be inserted without putting too much tension on the skin, and a hemisphere – a small cutting device that makes it easier to carve out a new hip socket.

In concert with several orthopedic surgeons nationwide, Dr. Sculco has studied the value of mini-incision total hip arthroplasty. As reported in the August 2004 *Journal of Arthroplasty*, their results showed that the procedure can be “performed safely and effectively through an abridged surgical incision.” Importantly, in the more than 2,000 patients Dr. Sculco and his HSS colleagues are following, there has been no greater incidence of problems with the modified incision.

Maximizing Outcome

Less trauma during surgery and reduced post-operative pain often means patients can rehabilitate more quickly. To facilitate their recovery, mini-incision hip replacement patients may enter a specially

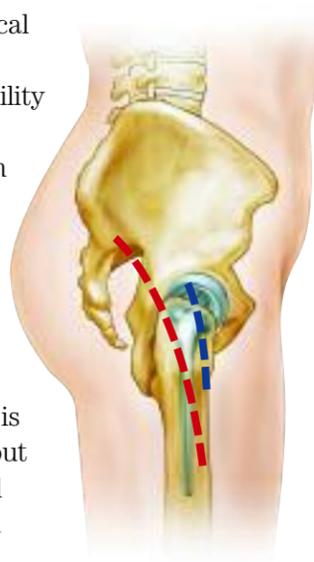


Following mini-incision hip replacement surgery, Glenn Borsky begins rehabilitation sessions with physical therapist, Colleen Gately, PT. Observes Janet Cahill, PT, Clinical Supervisor of Inpatient Rehabilitation, “Patients are amazed at how well they do so quickly after surgery and that they are allowed to walk so soon.”

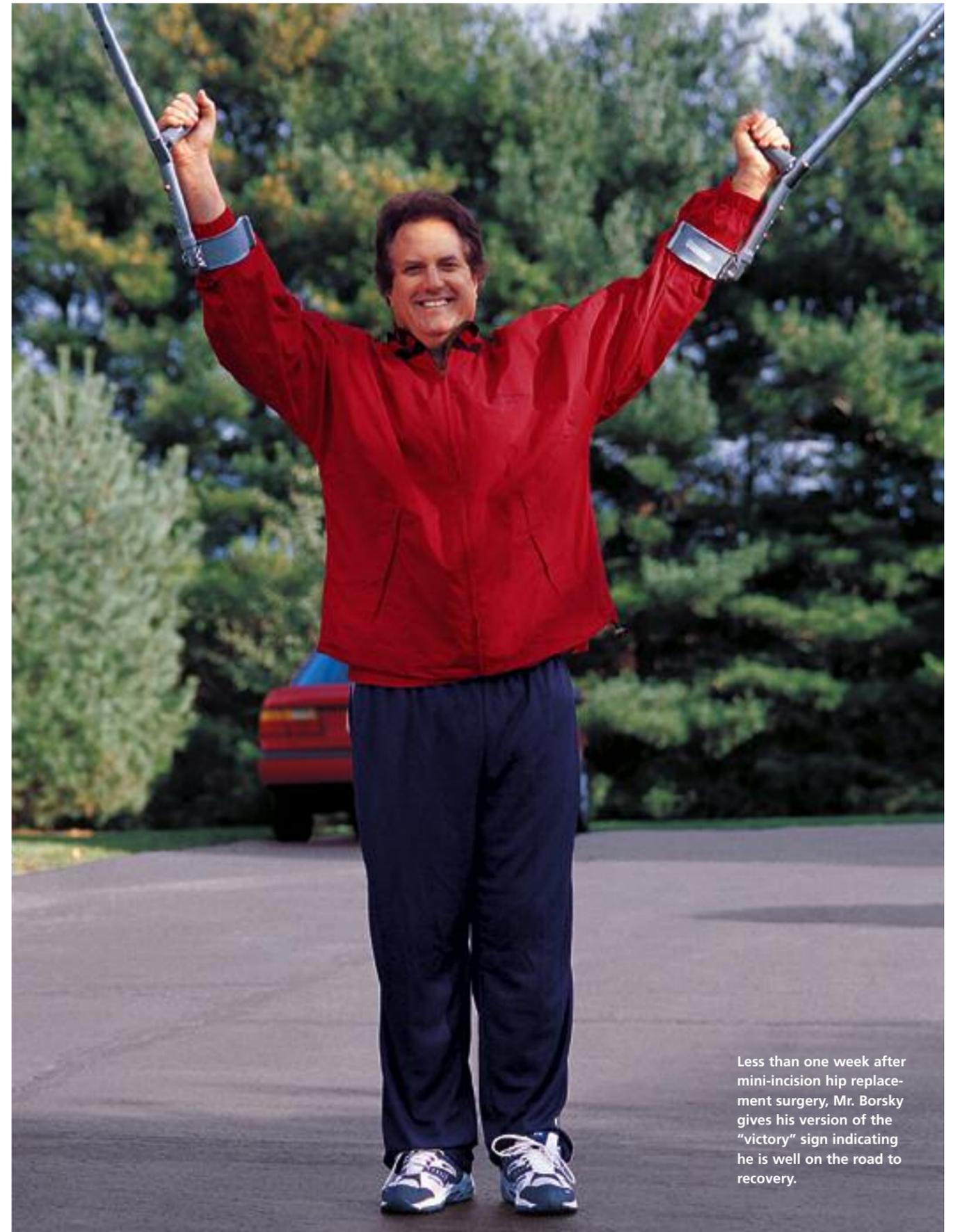
designed “fast track” physical therapy program. “A few hours after surgery, the physical therapist will initiate an exercise program and help the patient transfer out of the bed,” says Janet Cahill, PT, Clinical Supervisor of Inpatient Rehabilitation. “This helps patients to regain their mobility as early as possible.”

According to Dr. Sculco, factors such as body mass index and fat distribution, height, complexity of the pathology, medical history, and whether it is a first-time surgery are considered when deciding to perform an arthroplasty through a smaller incision. “The goal of using less extensive procedures is to facilitate the patient’s recovery without compromising prosthetic alignment and surgical outcome,” said Dr. Sculco in an editorial published in *The American Journal of Orthopedics*.

Dr. Sculco and his HSS colleagues now perform the majority of joint replacement procedures through incisions that average two-thirds shorter than those used in traditional surgery. Patients are pleased with their scar and, more importantly, are very satisfied with their results. ■



HSS orthopedic surgeons now perform hip replacement procedures through incisions that are an average of two-thirds shorter (as indicated in blue) than those used in traditional surgery.



Less than one week after mini-incision hip replacement surgery, Mr. Borsky gives his version of the “victory” sign indicating he is well on the road to recovery.