Comprehensive Care of the Hip - Ensuring a Lifetime of Mobility
New Hip, Renewed Life

As Chief of the Hip Service, Douglas E. Padgett, MD, (center) leads a faculty of orthopedic surgeons world renowned for their expertise in surgical treatment of the hip. Here, he performs a total hip replacement with Steven Shah, MD (right).

Photo below: Many of the Hospital’s surgeons use a cementless (bone-ingrowth) total hip replacement.
The evolution of treatment for hip disorders at Hospital for Special Surgery began to gain momentum in the 1960s, and in the four decades following, our physicians, biomedical engineers, and researchers have been leading the way in the development of treatment approaches that address virtually every type of hip pain, injury, and disorder.

Each year, Hospital for Special Surgery performs more hip surgeries, including primary and revision replacements, hip resurfacing, and arthroscopic procedures, than any other institution in the world. “With our dedicated focus on caring for patients with orthopedic and rheumatological conditions and an extremely high surgical volume – more than 2,500 cases a year for the hip alone – it follows that outcomes will be better for our patients,” says Thomas P. Sculco, MD, Surgeon-in-Chief.

According to Douglas E. Padgett, MD, Chief of the Hip Service, the Hospital is uniquely equipped to manage all aspects of disorders related to the hip in all age groups. With orthopedic surgeons and engineers who are pushing the envelope in surgical technique, implant design, and instrumentation; radiologists who are foremost authorities in orthopedic imaging; a highly skilled orthopedic OR team and a Magnet-recognized nursing staff trained in surgical care of orthopedic patients; and an on-site rehabilitation service that is without equal in its field, Hospital for Special Surgery is the premier center for comprehensive care of hip disorders.

“No one is too young or too old, and every hip condition can be addressed, even when compounded by other medical conditions,” says Dr. Padgett. In fact, the unparalleled experience of the Hospital’s orthopedic surgeons and their ability to manage high-risk cases makes it possible to treat patients with the most complex and challenging conditions when other institutions have been unable to offer help or hope. Laura Galbo is a case in point.

**A Complex Case, A Model Solution**

From horseback riding in Alaska to swimming with the dolphins in Jamaica to touring the Outback of Australia, Laura Galbo is a woman on the go. Just three years ago, she was suffering with intractable pain in both hips. Ms. Galbo, 4’ 1”, had struggled for a number of years in pain and had reached a point where she could no longer function. Doctors at other institutions advised against hip replacement surgery due to her young age (45 at the time) and the complexity of her case. However, Ms. Galbo, a former educator with many interests and a passion for travel, refused to accept a future of pain and immobility.

“Laura's level of deformity and her short stature presented a huge challenge,” says Dr. Padgett. Over the next three to four months, Dr. Padgett conferred with Philip D. Wilson, Jr., MD, Surgeon-in-Chief Emeritus; Timothy Wright, PhD, Director of Applied Biomechanics in Orthopedic Surgery; and Joseph Lipman, MS, Director of Device Development, to determine the best treatment plan for Ms. Galbo.

“Laura's joint anatomy could not take a standard implant,” says Dr. Padgett. “She required a pencil-thin stem because the diameter of the canal of her femur was so small. This was about as unusual a custom implant as you’ll ever have.”

Mr. Lipman and Dr. Padgett used computer-aided design to create virtual blueprints of Ms. Galbo's anatomy. “We can build 3D plastic models of specific anatomy for implant design in complex cases such as Laura’s or for whatever reason a model might be helpful to the
surgeon,” says Mr. Lipman. “We can also do pre-operative planning with our software, where we can actually cut the model to simulate a surgical procedure.”

“Dr. Padgett was able to give me back quality of life,” says Ms. Galbo. “After my first hip was done, I visited my cousin Jim who said, ‘you look 10 years younger. Your face isn’t covered in pain anymore.’ Once my left hip was done, and I had no more pain, it was like the right hip was screaming, ‘me next, me next!’”

Ms. Galbo’s second hip replacement took place 16 months later.

**New Hips for a Hip Generation**

“With the patient population becoming younger,” says Mark P. Figgie, MD, Chief, Surgical Arthritis Service, “the ongoing challenge with hip replacement is increasing the durability of the implant and improving its fixation to the bone to diminish wear over time. Among the advances over the past 20 years has been the advent of cementless technology to encourage bone to grow directly into the implant. With the implant solidly fixed to the bone it’s less likely to wear out or come loose.”

“We know that with correct patient indications, both non-cemented and cemented implants do incredibly well,” says Dr. Wright. “If you have good, healthy bone and you’re a young, active patient, the surgeon is more than likely going to use biologic fixation – without cement – because it is ultimately more durable.”

The evolution of hip replacement surgery has also included improvements in implant design. One of the possible effects of hip replacement is thigh pain due to inflexibility of the metal stem component of the implant. So Drs. Padgett and Figgie; the Hospital’s bioengineering team, headed by Dr. Wright; and surgeons from around the world, sought to address this problem by creating a new implant that was a modification of an earlier design invented at Special Surgery. Dubbed the Anatomic 2, the new implant came to life not only through the collaboration of physicians, but also aided by three-dimensional bone modeling that allowed the development of a more anatomically correct stem.

“TThe modified implant differs from previous cementless implants in that it has a tapered stem to better fit the anatomy of the bone,” says Dr. Padgett. “We have been using this implant in patients for the past few years with excellent results.”

Joseph Lipman, MS, created virtual prototypes of Laura Galbo’s hip joints from CT scans and a design template (far left). In cases similar to Ms. Galbo’s, the Hospital’s bioengineers can now create 3D models with their new ‘model maker,’ or rapid prototyper. Ms. Galbo had her left hip replaced first and her second hip 16 months later with excellent results as shown in her follow-up images.

**The Picture of Health ›**

From 18 to 80, people with hip pain can find relief at Hospital for Special Surgery, recently ranked number one in orthopedics by U.S. News & World Report’s “America’s Best Hospitals” survey. Here patients from all walks of life with conditions of varying complexities receive treatment that enables them to return to pain-free mobility. Following are just some of the thousands of patients who turn to Special Surgery each year for care.
Revision – Right Hip

“Having this surgery allowed me to continue my lifelong passion of riding motorcycles.”
Henry Groh, 60
Sales

Resurfacing – Bilateral Hips

“Resurfacing has completely changed my life.”
Chris Curcura, 40
President, Medical Education Company

Resurfacing – Right Hip

“Surgery gave me my life back.”
Barbara Bailey, 54
Former Money Market Broker

Arthroscopy – Left Hip

“Before I was in pain no matter what I did. Now, I hope to get back to softball soon.”
Ashley Frontino, 19
Student

Arthroscopy – Right Hip

“I was devastated by my injury. Now I’m back to sports – and being the active person I was before.”
Taryn Phelan, 16
Student

Hip Replacement – Left Hip

“I’m a very physical guy, and I love cycling. This surgery has definitely helped me to keep going.”
Bruce Taylor, 49
Law Enforcement

Hip Replacement – Right Hip

“I have been able to return to biking, playing with my kids, and jumping for joy.”
Penny Hoff, 46
Fitness Professional

Revision – Right Hip

“I may not be able to run…but I am able to walk again.”
Murray King, 84
Investment Entrepreneur

Rheumatoid Arthritis – Bilateral Hips

“Instead of using a wheelchair or crutches, I’m able to walk and enjoy quality time with my family.”
Dierdre Zorn, 39
Former Teacher

Hip Replacement – Left Hip

“As a dance teacher, I had become limited in what I could do. This surgery gave me back my mobility and my life.”
Sharron Miller, 62
Artistic Director

Arthroscopy – Bilateral Hips

“I’ve been able to achieve my goal of playing ice hockey at the highest level.”
Brandon Russo, 15
Student Athlete

Knee Replacement – Left Hip

“I can function as a dance teacher. I feel that I can do what I used to do. This gives me a lot of freedom.”
Jane Smith, 55
Dance Teacher

Knee Replacement – Left Hip

“I feel like new again. I’m active. I drive. I take long walks. I’m in good shape.”
Rubens De Oliveira, 84
Volunteer Church Administrator

Knee Replacement – Right Hip

“I feel much better and am able to do things that I was hesitant to do before.”
Annie Burroughs, 74
Retired Nurse

Knee Replacement – Right Hip

“I could resume a normal life thanks to my surgeons!”
Rainey Griffis, 66
Retired Teacher

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I never dreamed I could resume a normal life so quickly.

Raymond Griffis, 64
Interior Designer

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**Hip Replacement – Bilateral Hips**

I look forward to doing more things and not just sitting around.

Noel Trinidad, 66
Actor

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I never thought I’d walk again. My doctors have given me back my life.

Raina Paul, PhD, 58
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“My wife and I are going to travel around Spain for a month – and do a lot of walking!”

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“I must say that my doctors have given me back my life.”

Jose Maria Martinez, 72
President, Medical Education Company

Revision – Right Hip

“Revision surgery gave me my life back.”

Tony Amano, 73
Student
Hip Replacement

A common misconception is that the parent of patients who come to hospital for special surgery for hip replacement surgery (a term patients sometimes find confusing and a less complex anatomy, but the same nociceptor, involved around the hip joint.

A new generation of orthopaedic surgeons, moving away from the use of cement to secure hip replacement implants, is allowing them to consistently improve not only their surgical technique but also their approach to pain management and rehabilitation.

Among the Hospital's orthopedic surgeons, Dr. Thomas P. Sculco, MD, “and we operate using regional anesthesia – a method pioneered here at the Hospital for Special Surgery. The technique has improved access to the hip joint and visualization of structures, or remove debris.

The Hip: Offering an Array of Treatment Options

Along the continuum of comprehensive care for the hip joint provided by orthopedic surgeons at Hospital for Special Surgery are hip replacement surgery and joint preservation procedures, including hip resurfacing and hip arthroscopy.

Hip Replacement

Cementless Total Hip Replacement

The two procedures differ in that with both traditional hip replacement surgery, asked, “Why is the operation?” With this observation came the idea of a “hip research revolution” says Mathias P. Bostrom, MD. “Young patients with hip dysplasia develop when the socket is too deep or the bone is too shallow, resulting in bone loss around the implant instead.”

In the medical community, revision hip replacement surgery is gaining a growing interest as an alternative to total hip replacement surgery. With a surface replacement, the bone is sculpted to receive the implant. The all-metal implant allows for the most rapid recovery.

A Closer Look at Hip Resurfacing

The Hip Arthroscopy

Arthroscopy is used to examine, diagnose, and treat conditions of the joint’s inner and outer structures, without making large incisions. Arthroscopy routinely to treat non-arthritic conditions, such as hip impingement or ligament tears, and reaching into the hip joint to remove impingements or scar tissue.

When the head doesn’t fit deeply into the socket, it creates friction and pressure, which is inserted through one keyhole-sized incision.

Hip Resurfacing

The surgical procedures differ in the way that the hip is approached. Cementless Total Hip Replacement involves removing the previous implant and replacing it with a new one. In Hip Resurfacing, the bone is sculpted to receive the implant. The all-metal implant allows for the most rapid recovery.

A Closer Look at Hip Resurfacing

Among the Hospital’s orthopedic surgeons, says Dr. Nestor. “Our anesthesiologists, nurses, and the surgical team maintain the patient on a spineboard, ready to break down the barrier and treat the laceration.”

For patients who are doing well and want to remain active and independent, the Hospital’s orthopedic surgeons are exploring less invasive procedures for hip replacement surgery.

Non-Implant Options: Arthroscopy and Osteotomy

Arthroscopy and osteotomy allow surgeons to preserve the native hip joint as long as possible. Hip Arthroscopy, hip resurfacing, and hip replacement surgery.

Hip Dysplasia

When the head doesn’t fit deeply into the socket, it creates friction and pressure, which is inserted through one keyhole-sized incision. With arthroscopy or osteotomy, we can recontour the socket to provide better support as the patient’s body loads through the hip joint. If the cartilage is still pretty good, and especially if the patient is doing active things, we can do hip resurfacing surgery, and if the cartilage is bad, we have to do a hip replacement.
Along the continuum of comprehensive care for the hip joint provided by orthopedic surgeons at Hospital for Special Surgery, hip replacement surgery and joint procedures, including hip resurfacing, fall under the heading of treatment options.

**Hip Replacement**

A hip replacement replaces one or both parts of the hip of patients who come to hospital for special surgery for hip replacement surgery. There are different types of replacements, varying in complexity, depending on the patient’s needs, as well as the extent and site of the disease.

An arthroplasty, or hip replacement surgery, is performed to replace the cartilage and improve the mechanics of the hip joint that is too shallow, making contact between the femoral head and acetabulum impossible.

**Hip Resurfacing**

In hip replacement surgery, the femoral head and acetabulum are removed, and a prosthesis is inserted. In hip resurfacing, the femoral head is resurfaced with a metal liner and a metal ball, while the acetabulum is preserved.

**Non-Implant Options:**

For those patients who are not candidates for hip replacement surgery, there are several non-implant options available. These include arthroscopy and osteotomy, which allows for treatment without implants. Arthroscopy and osteotomy are procedures designed to address problems within the hip joint—indications for the procedure include the need for a hip replacement.

**Arthroscopy**

Arthroscopy allows orthopedic surgeons to look inside the hip joint through a small incision. The arthroscope, which is a long, thin instrument, is inserted into the hip joint. The surgeon can then examine the joint and perform minor procedures, such as shaving tissue, cauterizing tissue, or ligaments.

**Osteotomy**

Osteotomy is a surgical procedure that involves cutting or reshaping a bone to relieve pressure on the joint and improve its function. It can be used to correct abnormalities in the alignment of the femur or to realign the femur and acetabulum to improve the mechanics of the hip joint.

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In the Hospital’s state-of-the-art Computer Assisted Orthopedic Surgery Center, our orthopedic surgeons are also investigating navigational software with applications to surgical tools that can guide surgeons in the operating room, enabling precise placement of the implant through a mapping system that defines both anatomy and instrumentation. Clinical application of computer technology is a particular interest of David J. Mayman, MD, who is involved in the Hospital’s efforts to advance computer-assisted surgery.

Addressing Implant Wear Factors

Bryan J. Nestor, MD, and Edward Purdue, PhD, look at bone loss or osteolysis from a bone destruction perspective related to wear debris. Dr. Purdue applies both clinical and basic science resources to tackle periprosthetic osteolysis—a condition of bone loss around the hip prosthesis. “Wear is inevitable,” explains Dr. Purdue. “It just happens through the functioning of these prostheses, regardless of the materials used.”

Clinician-scientists in the osteolysis laboratory headed by Dr. Purdue continue work in understanding the body’s response to artificial joints, the mechanism triggering the development of osteolysis in response to debris particles, and why the process occurs in some patients and not in others.

“Wear debris generated from implants is still, in many ways, an unsolved problem,” says Dr. Nestor. “In the last decade, we have gained a much better understanding of the causes of wear debris, leading to efforts to reduce this problem by using ceramic-on-ceramic or metal-on-metal implants.”

“A newer device made of ceramic materials may last longer than the traditional hip replacement made of metal and plastic,” says Geoffrey H. Westrich, MD. “If an implant can last 20 years or more, total hip replacement becomes a viable option for younger patients suffering from arthritis.”

In a storage facility some 20 miles north of New York City, thousands of retrieved joint implants hold important information for the future of joint replacement surgery. This archive—created by Dr. Wright and Albert Burstein, PhD, former Director of the Department of Biomechanics, is a source of critical data that is helping to drive the development and refinement of implant materials and design. The Hospital was one of the first in the United States to begin archiving actual retrieved implants and is still one of only a few institutions in the world with this now Web-based capability.

“We registered the first implant in December 1977, and we now have surpassed 18,000 implants, not only for the hip, but also for the knee, elbow, finger, and wrist joints,” says Dr. Wright. “The value in these retrieved implants is that they are our first line of evidence on how the actual implant performs. For example, why did the implant fail or why did the patient need a hip revision? Was it an infection or injury and not the fault of the implant at all?”

In a concurrent effort to track patient progress, this past year, Hospital for Special Surgery was awarded a five-year, multimillion-dollar grant from the Agency for Healthcare Research and Quality to establish a Center for Education and Research on Therapeutics (CERT), focusing on therapeutic medical devices. The Hospital is partnering with Weill Cornell Medical College to study factors affecting outcomes in patients who have their hip, knee, or
Preserving Hips: A Look at the Future

Clinicians and scientists at Special Surgery continue to examine hip disease on many levels in order to improve upon techniques and therapies. “Each of our basic science research programs have investigators who are working on the problems of hip degeneration,” says Steven R. Goldring, MD, Chief Scientific Officer. Among the Hospital’s top research priorities is osteoarthritis – the principal cause of physical disability and functional impairment in adults and, by far, the most common condition leading to the need for joint replacement.

“A number of our laboratories are trying to understand how abnormal mechanical loads are either damaging the cartilage or adversely affecting the function of the cells in the cartilage to interfere with their normal activity, ultimately using the information to try to identify therapeutic approaches for intervention,” says Dr. Goldring. “We also have groups working on tissue engineering trying to develop improved approaches for generating either artificial cartilage or promoting cartilage repair when it has been injured.”

Progress Through Professional Exchange

“Any hip condition can be approached and treated in different ways. By interacting with colleagues that practice at other institutions, we can expand our approaches and treatments for a particular hip problem. We learn from them as much as they learn from us,” says Alejandro Gonzalez Della Valle, MD. “It is paramount that we have national and international education and professional exchange. This, among several other factors, creates in Hospital for Special Surgery an environment conducive to the improvement of patient care.”

In 2005, Dr. Sculco created the International Specialty Orthopaedic Collaboratorium (ISOC) to further develop global relationships, foster collaboration of research studies, and promote training. The organization held its inaugural meeting this year with nine institutions from eight countries “By bringing together thought leaders in the orthopedic community from all over the world,” says Dr. Sculco, “the ISOC will provide an opportunity to impart knowledge on patient care, education, and research-based programs to enhance orthopedic care on a global scale.”

Robert L. Buly, MD, demonstrates computer-based navigation techniques that will facilitate surgery for hip disorders.

Alejandro Gonzalez Della Valle, MD, with Luis E. Moya, MD, who is a visiting research fellow from Chile.

The CERT grant further supports research to evaluate the uses and success of prosthetic implants. In addition, a comprehensive prospective Total Joint Replacement Registry has been developed to collect data to address questions regarding patient outcomes and the economic impact of total joint surgeries.

“Anyone who is undergoing a hip, knee, or shoulder replacement is asked to participate in the registry,” says Michael M. Alexiades, MD, who, along with Thomas P. Sculco, MD, Robert G. Marx, MD, and Lisa A. Mandl, MD, directs the CERT program for Special Surgery.

“The registry includes clinical parameters, such as type of arthritis, specific joint involved, and pain, stiffness, and functional levels of patients,” reports Dr. Alexiades. “Having all these data amassed in one place allows us to conduct prospective outcomes-based studies in terms of how patients are really doing after a hip or knee replacement. What percent improve? Are they functionally better, and how much better?” Patients will continue to be registered throughout the five-year grant, with an expected enrollment of 15,000 patients.
On the Go

Thanks to a pair of new, specially designed hips, Laura Galbo has resumed an active lifestyle. She continues to travel and pursue obedience and agility training with her Shelties. Ms. Galbo was very involved in the development of her hip implants, and even met with Joseph Lipman, her “personal” design engineer.
In 1967, the first total hip replacement at Hospital for Special Surgery was performed by Philip D. Wilson, Jr., MD. “We became interested in the early 1960s in total hip replacement following reports of the pioneering work of Sir John Charnley,” recalls Dr. Wilson. In 1969, Dr. Wilson established the Hospital’s unique Bioengineering Department, which became the first in the country to have the capability for computer-assisted design and manufacture of custom implants.

In 1969, Eduardo A. Salvati, MD, was a hip fellow under the direction of Dr. Wilson. Upon conclusion of his fellowship, Dr. Salvati had his suitcases packed to return home to Buenos Aires, Argentina when Dr. Wilson, who had just been named Surgeon-in-Chief, asked him to stay on as Chief of the Hip Service. That was 38 years ago, and Dr. Salvati has been making his mark in hip surgery ever since.

Dr. Salvati’s contributions to reducing the risk of complications following hip replacement surgery have earned him numerous awards, including the distinguished 2007 Nicholas Andry Award. He is also Past President of the American Hip Society. Most recently, friends and supporters of Special Surgery are contributing to establish the Eduardo A. Salvati, MD, Chair in Arthroplasty, which will help the Hospital to sustain excellence in joint replacement surgery.

In 1988, Dr. Salvati became Director of the Hip and Knee Service, and Paul M. Pellicci, MD, took over as Chief of the Hip Service. When Dr. Pellicci began practicing at Special Surgery in 1981, most of his patients were older and waited longer before deciding to have joint replacement surgery. “Now, baby boomers have retired, and they are staying active,” says Dr. Pellicci. “If pain interferes with their plans, they come in sooner for the treatment they need to get back to that lifestyle.”

During his tenure, the Hip Service grew tremendously and Dr. Pellicci established the first fellowship (in hip) at the Hospital to be accredited by the Accreditation Council for Graduate Medical Education.

As Chief of the Hip Service today, Douglas E. Padgett, MD, continues to build on the accomplishments of Drs. Wilson, Salvati and Pellicci in advancing the growth and development of the Hip Service.