Westchester Medical Center and Hospital for Special Surgery: Partners in Fellowship Training

David E. Asprinio, MD, Chairman of Orthopaedic Surgery, New York Medical College, and Director of Orthopaedic Surgery at Westchester Medical Center, first became associated with Dr. David Helfet in 1993 as a fellow in orthopaedic trauma at Hospital for Special Surgery. It was the beginning of a professional relationship that continues to this day through a joint orthopaedic trauma fellowship program between the two hospitals.

After completing his fellowship at HSS, Dr. Asprinio pursued an orthopaedic spine fellowship at the Shock Trauma Hospital in Baltimore before joining the faculty at New York Medical College and Westchester Medical Center in Valhalla, New York. A Level One Trauma and Burn Center, Westchester Medical Center serves more than 3.5 million people in Westchester County, the Hudson Valley, New York City, and Fairfield County, Connecticut.

“I’ve been a very busy trauma-tologist and spine surgeon since the day I arrived,” says Dr. Asprinio. “Westchester is located near a number of highways, so we see a large number of patients injured in motor vehicle and motorcycle accidents. Early on, it was extremely beneficial to me to be located in such close proximity to HSS. I would pack up X-rays of upcoming complicated cases or cases that I had done and drive down to the city and review them with Dr. Helfet. My learning from Dr. Helfet continued long after I completed my fellowship.

“In the early 2000s,” says Dr. Asprinio, “we instituted a fellowship training program in which fellows were based entirely at Westchester Medical Center. Speaking to Dr. Helfet at that time, we realized that the educational opportunities available in Westchester and those available at Hospital for Special Surgery really complemented each other.”

Dr. Asprinio also believed that HSS’s rich research infrastructure would enhance the fellowship training experience. Today the one-year program now includes four months of clinical work at HSS, four months of clinical activity at Westchester Medical Center, and four months in a research laboratory.

“Our association with HSS, Dr. Helfet, and the Orthopaedic Trauma Service has improved the quality of patient care throughout the region,” notes Dr. Asprinio. “Many of the fellows that we have trained jointly, or those who Dr. Helfet has trained at HSS, are now working within the five boroughs, Long Island, and Westchester County. Indeed, the relationship between me and Dr. Helfet and the entire Orthopaedic Trauma Service extends across much of the nation and to other countries, where fellows who have been trained either prior to this affiliation, or subsequent to it, are now working. For me, professionally and personally, it has been and continues to be a valuable and very enjoyable association.”

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Novel Approaches to Vascularity Research

The Orthopaedic Trauma Service – in partnership with the HSS Bioskills Education Laboratory, NewYork-Presbyterian Hospital, and the Citigroup Biomedical Imaging Center – has developed groundbreaking methods for studying the arterial contributions associated with bone perfusion. This research represents a significant collaborative effort of multiple orthopaedic and radiology specialties.

The goal of the vascularity research initiative is to precisely assess contributions from arterial sources to bone perfusion using gadolinium-diethylenetriamine penta-acetic acid (Gd-DTPA) contrast-enhanced magnetic resonance imaging (MRI) in a cadaveric model. The researchers have developed methods for precise quantitative evaluation of Gd-DTPA perfusion through custom MRI assessment software. Through this approach, the target arteries are cannulated in the research laboratory. The MRI protocol is carried out using a 3.0 Tesla GE Magnetic Resonance Imaging scanner with specialized coils, as indicated. High resolution, fat-suppressed, 3D gradient echo sequences are obtained before and after administration of the contrast agent. Gd-DTPA solution is injected manually into the cannulated target artery or arteries. Static fat-suppressed and un suppressed post-contrast T1-weighted 3D gradient echo imaging is obtained after each injection. Following the MRI protocol injection of a polyurethane compound with vascular dissection allows for qualitative assessment, confirmation of MRI findings, and further documentation of extravascular vascularity. These methods have been successfully performed in multiple applications, including the upper and lower extremity. Following is a look at some of the current research in which the Orthopaedic Trauma Service is applying these novel methods.


Precise knowledge of the femoral head arterial supply is critical to avoid femoral head avascular necrosis following open and arthroscopic intracapsular surgical procedures about the hip. The MFCA provides the primary femoral head vascular contribution. However, no quantitative information exists on the precise capsular insertion and intracapsular course of the MFCA terminal branches supplying the femoral head. This study demonstrated that terminal branches of the MFCA penetrate the joint through the mid-substance of the capsule (from the transverse MFCA) or the FCA (from the ascending or deep MFCA). Once intracapsular, these vessels course subsynovial or within the retinaculum of Weitbrecht and terminate at the posterior femoral head-neck junction superiorly (from the deep MFCA) and inferiorly (from the ascending and transverse MFCA). Any surgical hip intervention should preserve the posterior FCA, and lateral and medial retinaculum of Weitbrecht in order to preserve the femoral head vascular supply. These results illustrate a vascular danger zone that should be respected during surgery and can be easily interpreted with the commonly used clock face.


Avascular necrosis of the femoral head is a significant complication that can arise following surgical hip dislocation. Wide exposure and direct approach to the femoral head and acetabulum are essential for the treatment of severe hip disease and hip trauma in both the pediatric and adult populations. The goal of this study was to evaluate and quantify perfusion to the femoral head and head-neck junction using gadolinium-enhanced MRI following three commonly used surgical hip dislocations – trochanteric flip osteotomy, standard posterior approach, and modified posterior approach. The results demonstrated that anterior surgical hip dislocation through a trochanteric flip osteotomy preserves the vascular supply to the femoral head and head-neck junction. The standard posterior approach disrupted the vascular supply of the femoral head and head-neck junction and should be completely abandoned. Despite reduced enhancement, significant perfusion of the femoral head and head-neck junction was present in the modified posterior approach group, likely due to preservation of the IRA artery. The modified posterior approach presented marked variability, indicating that improvement to this procedure is needed.


Complications and residual anterior knee pain have been hypothesized to develop secondary to disruption of the patellar vascular supply. Understanding the contribution of major patellar blood vessels and the associated effects of patellar fracture on vascularity can aid in surgical planning, fracture fixation, and patient counseling. This study defined the arterial supply to the patella and evaluated the effect of fracture on patellar vascularity. MRI analysis demonstrated the dominant arterial contribution to the...
patella was through an artery entering at the distal pole in 100 percent of specimens (80 percent entering inferomedially). It also revealed an overall decrease in contrast enhancement in both transverse osteotomy groups, with an average reduction in enhancement in the proximal fragment of 36 percent. Enhancement in the superior half of the patella was compared to the inferior half in 10 control specimens; an average 69 percent greater enhancement was found in the distal pole.

If possible, surgical interventions about the knee should be carefully planned for preservation of the peripatellar ring (source of the entire patellar blood supply), especially the inferior patellar network.

Dr. David Wellman: Learning the Language of Trauma

In 2012, the Orthopaedic Trauma Service welcomed David S. Wellman, MD, a July 2011 graduate of the HSS Orthopaedic Trauma Fellowship Program. Recently, Dr. Wellman discussed what drew him to the field of orthopaedic trauma and why he has chosen to pursue his surgical career at Hospital for Special Surgery.

How did you happen to join Hospital for Special Surgery?
I came to HSS on the advice of one of my mentors during residency who did his fellowship with Dr. David Helfet. Through talking to him about my career development, he recommended that I train with Dr. Helfet as well. So after I completed my residency, I came to New York as a fellow and spent a year under Dr. Helfet, basically learning the language of trauma. Thankfully, I was able to stay on with him as a junior partner on the Orthopaedic Trauma Service.

What attracted you to the specialty of orthopaedic trauma?
Orthopaedic trauma is appealing to me because of its necessity. There is no question about the need for you as a surgeon – patients are acutely injured, unable to walk, and in obvious need of surgical care. You’re taking care of people who, in some cases, are badly injured from either car accidents or falling off ledges. What we do is very tangible. At the end of the day you’re able to reconstruct them and give them limbs that work again. It’s very rewarding to be able to offer that to people.

Describe your practice.
The HSS opportunity is unique in that it offers a multi-faceted practice where you take care of acute trauma and the late sequelae with non-unions, infections, and the types of injuries that come with the territory. Working among some of the most talented orthopaedic surgeons in the world raises your standard of practice and improves patient outcomes. It’s as if you’re an athlete and get called up to play in the majors. Your performance on the field improves because you’re stepping up to the standards that your teammates are showing you.

I also cover Jacobi Medical Center, which is the major intake center for the Bronx, and work at NewYork-Presbyterian/Weill Cornell. This allows me to be involved in all facets of trauma care – from the acute intake at a Level One Trauma Center to managing non-unions and reconstructions. That’s what makes it enjoyable for me. We’re not short on variety!

What is your interaction with other specialists at HSS?
We team up regularly with other surgical subspecialties. In polytrauma, it’s common to have more than one specialty involved. General trauma surgeons manage the chest and abdomen injuries; plastic surgeons address soft tissue defects; and neurosurgeons deal with spine and brain injuries. You’re often coordinating care with all of these services.

I’ve operated with surgeons from ENT to neurosurgery to plastics and general surgery. This requires you to think outside the box and weigh your surgical indications with somebody else’s while you prioritize the needs of a critically sick patient. It’s a skill that you don’t learn in med school, or for that matter, you don’t necessarily even learn in residency.

One of the great things about HSS is that excellence and perfection are the standards here. This raises your level of awareness and what you consider to be acceptable. It makes you better, it makes the discussions outside of the operating room better, and it grows you more as a surgeon.

What has your research experience been at Special Surgery?
From a resource standpoint these high standards are also seen in the research conducted at HSS. I have multiple collaborations with the PhDs, scientists, and the Biomechanics Department. Again, I think it raises the bar of the quality of your research. When you work with leaders in the field, it’s going to make your collaborative projects better, your research better, and it’s going to make your writing stronger. When you have sit-down discussions about study design and basic project development, these discussions are happening with editors of journals and award-winning research scientists, so the quality of the discussion is higher.
case studies: pediatric and adolescent trauma

While playing football, an eight-year-old boy was tackled and sustained a posterior fracture dislocation of his left hip. He was taken to a local hospital where he was clinically evaluated, radiographs were obtained, and an attempted closed reduction was unsuccessfully performed. He was then emergently taken to the operating room for an open reduction of his hip dislocation. Two weeks following the injury, he presented to Dr. David Helfet at Hospital for Special Surgery for a second opinion.

Additional X-rays obtained at HSS were suggestive of slight lateral subluxation of the hip and the possibility of an intra-articular fragment within the hip joint. A magnetic resonance imaging scan was then performed in order to fully assess the injuries associated with his posterior hip dislocation, including the non-ossified aspect of the posterior wall fragment and the cartilage of the femoral head and acetabulum. The MRI imaging demonstrated a posterior wall acetabular fracture with a significant fragment of acetabular cartilage, 1.3 cm in size, interposed in the hip joint along with the attached transverse ligament – all contributing to the observed subluxation of the hip. A focal small high-grade partial thickness chondral defect to the parafoveal margin of the femoral head was also observed near the intra-articular fragment.

Repeat open reduction and internal fixation (ORIF) was performed expeditiously, on the same day as presentation, to prevent further damage to the hip joint associated with a retained intra-articular fragment. Through a Kocher-Langenbeck approach, the intra-articular fragment was carefully identified and repaired, along with the labral and capsular attachment, using two suture anchors with additional suture repairs of the labrum and hip capsule. The patient returned for regular follow-up visits. At one year following surgery, he presented with excellent clinical and radiographic results, including a healed acetabular fracture, full pain-free hip motion, and a full return to all pre-injury activities, including sports.

A 16-year-old girl injured in a motor scooter accident during a family vacation suffered a complex acetabular fracture that required an extensive open anterior approach to the pelvis to allow for a perfect reduction of the hip joint. The patient and her family travelled from the Netherlands to see Dr. David Helfet in New York on the advice of Peter Kloen, MD, who had trained with Dr. Helfet and was now an orthopaedic trauma surgeon in the Netherlands.

Two days after her arrival at Hospital for Special Surgery, the patient was taken to the operating room for definitive management of her T-type variant acetabular fracture, including open reduction and internal fixation through the lateral two windows of the ilioinguinal approach. Exposure was further gained through fracture. The small interposed articular fragment was then removed and the fracture was reduced and fixed using a pelvic reconstruction plate and multiple screws along the pelvic brim. A second pelvic reconstruction plate and multiple screws were placed along the quadrilateral plate with fixation to the ischium.

After a two-week stay in the United States the patient returned to the Netherlands. At five months, the fracture was healed, and by six months the patient was back to a full schedule of activities. At a follow-up at 19 months past surgery, she is pain free and has resumed all activities.

case study 2: Complex Acetabular Fracture

1. Anteroposterior, obturator oblique, and iliac oblique radiographs of a left-sided T-type acetabular fracture.
2. CT scan imaging further delineates the fracture pattern, marginal impaction, and interposed fragment.
3. 3D reformatted CT scan images.
4. Intraoperative fluoroscopic imaging following open reduction and internal fixation demonstrates acceptable reduction and placement of hardware.
5. Radiographs at 19 months illustrate a healed acetabular fracture.
6. At 19 months following surgery, patient has resumed pre-injury activities pain free.
The secondary articular density was created by a confluence of the central ridge between the medial and lateral facets in all specimens. The dorsal cortical density. The articular tangent was produced by the tangent, a secondary articular density of variable length, and a features of the lateral view of the patella included the articular obtained with the limb in neutral alignment. Constant radiographic imaging specific features of the patella, and demonstrate their utility of the patella, describe reproducible accessory views for assess-

anatomic description of all radiographic features of the true lateral view of the patella has not been previously performed, and no accessory views to better visualize specific anatomic features have been developed. The purpose of this study was to provide a detailed anatomic description of all radiographic features of the true lateral of the patella, describe reproducible accessory views for assessing specific features of the patella, and demonstrate their utility in a fracture model. The true lateral projection of the patella was obtained with the limb in neutral alignment. Constant radiographic features of the lateral view of the patella included the articular tangent, a secondary articular density of variable length, and a dorsal cortical density. The articular tangent was produced by the central ridge between the medial and lateral facets in all specimens. The secondary articular density was created by a confluence of the edge of the lateral and edge of the medial facets in five patellas, a confluence of the edge of the lateral facet and the intersection of the odd and medial facet in six patellas, and the edge of the lateral facet alone in one patella. The edge of the lateral facet gave a constant contribution to the appearance of the secondary articular density in all cases. A distinct accessory view of the tangent of the lateral facet could be seen with an average of 17 degrees of patellar external rotation (range 12-35 degrees), and the tangent of the medial facet with an average of 26.5 degrees of internal rotation (range 15-45 degrees). These accessory views were better able to visualize malreduction than the single lateral projection in a fracture model in all specimens. These views can be employed in the evaluation of minimally displaced patellar fractures if a CT scan is not desired to better assess the true amount of displacement and when assessing intraoperative reduction during patellar fracture osteosynthesis.

**selected publications**


**AAOS Poster Presentation – 2013**

**Defining the Lateral and Accessory Views of the Patella: An Anatomic and Radiographic Study with Implications for Fracture Treatment**

Berkes MB, Little MTM, Lazaro LE, Pardee NC, Helfet DL, Lorich DG

The majority of orthopaedic surgeons rely on a lateral fluoroscopic image to assess reduction during patellar fracture osteosynthesis. However, a comprehensive radiographic description of the lateral view of the patella has not been previously performed, and no accessory views to better visualize specific anatomic features have been developed. The purpose of this study was to provide a detailed anatomic description of all radiographic features of the true lateral of the patella, describe reproducible accessory views for assessing specific features of the patella, and demonstrate their utility in a fracture model. The true lateral projection of the patella was obtained with the limb in neutral alignment. Constant radiographic features of the lateral view of the patella included the articular tangent, a secondary articular density of variable length, and a dorsal cortical density. The articular tangent was produced by the central ridge between the medial and lateral facets in all specimens. The secondary articular density was created by a confluence of the edge of the lateral and edge of the medial facets in five patellas, a confluence of the edge of the lateral facet and the intersection of the odd and medial facet in six patellas, and the edge of the lateral facet alone in one patella. The edge of the lateral facet gave a constant contribution to the appearance of the secondary articular density in all cases. A distinct accessory view of the tangent of the lateral facet could be seen with an average of 17 degrees of patellar external rotation (range 12-35 degrees), and the tangent of the medial facet with an average of 26.5 degrees of internal rotation (range 15-45 degrees). These accessory views were better able to visualize malreduction than the single lateral projection in a fracture model in all specimens. These views can be employed in the evaluation of minimally displaced patellar fractures if a CT scan is not desired to better assess the true amount of displacement and when assessing intraoperative reduction during patellar fracture osteosynthesis.
Orthopaedic Trauma Service Faculty

David L. Helfet, MD, is Director of the Orthopaedic Trauma Service at Hospital for Special Surgery and NewYork-Presbyterian Hospital/Weill Cornell Medical Center and Professor of Orthopaedic Surgery at Weill Cornell Medical College. A world-renowned orthopaedic trauma surgeon with more than 30 years experience in the field, Dr. Helfet has a particular interest in fractures of the pelvis and acetabulum. Born in Cape Town, South Africa, Dr. Helfet completed a surgical residency there at Edendale Hospital in Pietermaritzburg, followed by an orthopaedic residency at Johns Hopkins University in Baltimore, a trauma/arthroplasty fellowship at the University of Bern, Insel Hospital, in Switzerland, and a sports medicine fellowship at the University of California, Los Angeles. A trustee of the AO Foundation and AO North America and past President of the Orthopaedic Trauma Association, Dr. Helfet is a long-standing member of the American Academy of Orthopaedic Surgery and the American Orthopaedic Association. Most recently, Dr. Helfet was the Presidential Guest and Honorary member, South African Orthopaedic Association.

Gregory S. DiFelice, MD, specializes in sports traumatology and joint reconstruction surgery with a particular interest in ligament reconstruction of the knee. Dr. DiFelice has extensive experience in multi-ligament reconstructions, cartilage and meniscal repair, arthroscopic shoulder surgery, and arthroplasty. He earned his medical degree from New Jersey Medical School, graduating as a member of Alpha Omega Alpha Honor Medical Society, followed by a residency in orthopaedic surgery at Hospital for Special Surgery and a fellowship in sports medicine at Washington University in St. Louis. Prior to joining HSS, Dr. DiFelice founded and directed the Division of Sports Medicine and Joint Reconstruction Surgery for the North Bronx Healthcare Network and worked with the Ranawat Orthopaedic Center at Lenox Hill Hospital.

Joseph M. Lane, MD, Chief of the Metabolic Bone Disease Service at Hospital for Special Surgery, has long been at the forefront of research and treatment for osteoporosis and metabolic bone diseases, with specific focus on collagen metabolism and structure, skeletal tumors, connective tissue injury and repair, bone regeneration, and limb salvage. Dr. Lane earned his medical degree from Harvard Medical School, followed by a residency at the Hospital of the University of Pennsylvania. A Professor of Orthopaedic Surgery at Weill Cornell Medical College, Dr. Lane has served on numerous committees for the AAOS, including the Board of Directors and Chairman of COMSS. He served as President of the Orthopaedic Research Society and the Musculoskeletal Tumor Society, and as Chairman of NIH Orthopaedic Study Section. Dr. Lane most recently served as Chair of the Study Section, Special Grants Review Committee, National Institute of Arthritis and Musculoskeletal and Skin Diseases.

John P. Lyden, MD, a noted orthopaedic trauma surgeon and member of the Hospital’s Orthopaedic Trauma Service, also served as Chief of the Hip Fracture Service at NewYork-Presbyterian/Weill Cornell for more than 20 years. A specialist in fractures and joint replacement, Dr. Lyden, an Associate Professor of Clinical Orthopaedic Surgery at Weill Cornell Medical College, has published extensively on his research in fractures and is currently a participating investigator for a multicenter hip fracture study supported by a National Institutes of Health grant. Dr. Lyden graduated from Harvard University and earned his MD from Columbia University College of Physicians and Surgeons. He completed his orthopaedic residency training and a hand surgery fellowship at HSS. A decorated Navy orthopaedic surgeon, he received several awards for his valor, including the Vietnamese Cross of Gallantry, the Bronze Star, and three Presidential Unit Citations for his work with the United States Department of Defense’s research team.

David S. Wellman, MD, who specializes in the care of fractures and post-traumatic reconstruction, joined the Orthopaedic Trauma Service at Hospital for Special Surgery in 2012. Dr. Wellman has particular expertise in articular fractures, injuries to the pelvis and acetabulum, and non-union and mal-union fractures. Dr. Wellman graduated from Duke University with a degree in chemistry. He completed medical school at the University of North Carolina, where he graduated with distinction and was inducted into the Alpha Omega Alpha Honor Medical Society. Dr. Wellman went on to complete a residency in orthopaedic surgery at Northwestern University in Chicago, where he served as Chief Resident. Following residency, Dr. Wellman pursued a fellowship in orthopaedic trauma at Hospital for Special Surgery. After completing his training at HSS, Dr. Wellman traveled to Germany and Switzerland for further surgical training in the care of trauma patients and pelvic reconstruction.
The Orthopaedic Trauma Service is a combined service of Hospital for Special Surgery and NewYork-Presbyterian Hospital/Weill Cornell Medical Center. This collaboration brings together the resources and services that are unique to a musculo-skeletal hospital with the medical, surgical, and critical care specialties that are available at an academic medical center. As a specialty referral center, our program draws patients with complex orthopaedic trauma – both acute and subacute injuries – from throughout the region and beyond. Please do not hesitate to contact us if we may be of any assistance to you and your patients. If your patient requires an evaluation and/or treatment for an acute or subacute traumatic injury or emergency transport, please call the Orthopaedic Trauma Service, available 24 hours a day, seven days a week at (212) 606-1888.