Dear Colleagues and Columbia Alumni,

It has been an exciting year for Columbia Orthopaedics at NewYork-Presbyterian, and I’m pleased to share with you some of the clinical and research highlights achieved by our faculty. Our orthopaedic surgeons have been busy with the development, refinement, and application of surgical and non-operative procedures for musculoskeletal disorders. In addition to providing advanced care, we are equally dedicated to providing our patients and their families with personalized attention and compassion. As Columbia University College of Physicians and Surgeons faculty working in an academic medical center environment, we are continually interested in expanding and improving our programs and pursuing important avenues in the development of technologies and techniques that lead to successful outcomes for our patients. I hope you enjoy reading the following pages about what’s new with Columbia Orthopaedics at NewYork-Presbyterian. Please feel free to contact me if you would like more information about our programs.

Louis U. Bigliani, MD  
Chief, Department of Orthopaedic Surgery  
NewYork-Presbyterian/Columbia University Medical Center  
Frank E. Stinchfield Professor of Orthopaedic Surgery  
Columbia University College of Physicians and Surgeons  
(212) 305-0998  
lub1@columbia.edu

Clinical Highlights

The physicians in the Department of Orthopaedic Surgery are leaders in their respective specialties, and, as physician-scientists, continue to influence progress in the field. The following are a few of the Department’s recent highlights.

**Cerebral Palsy.** In January 2013, the Department opened the Weinberg Family Cerebral Palsy Center, a truly transitional cerebral palsy (CP) center providing integrated healthcare for patients from neonates to the elderly. As patients move through adolescence into adulthood, they face new and emerging health issues. Funded by Debby and Peter A. Weinberg and several of their family members and friends, the Center is the first of its kind on the East Coast dedicated to transitioning patients with CP from pediatric to adult care.

The Weinberg Family Cerebral Palsy Center offers a comprehensive, holistic approach to the needs of the pediatric and growing adult CP population, and has enlisted some 40 providers who care for the Center’s adult CP patients. Services include orthopaedic and physiatry evaluations, physical therapy, occupational therapy, and surgical procedures, among others. In addition, speech and language pathologists, social workers, and educators provide information and resources for patients and families. Referrals are made to other specialties as needed within NewYork-Presbyterian/Morgan Stanley Children’s Hospital and NewYork-Presbyterian/Columbia.

**Foot and Ankle.** The Department’s Foot and Ankle Center, led by Justin K. Greisberg, MD, is known for its expertise in complex reconstructive surgeries, including limb realignment, diabetic reconstruction, and total ankle replacement using arthroscopic procedures combined with the latest medications, braces, and orthotics to ensure an optimal recovery. Dr. Greisberg, who is an editor of the upcoming AAOS publication, *Advanced Reconstruction of the Foot and Ankle,* has twice been recognized – in 2011
and 2012 – with the Patients’ Choice Award, which is bestowed to physicians who have received near perfect scores as voted by their patients for this honor. Dr. Greisberg and his colleagues recently completed research on syndesmotic injuries in ankle fractures looking at the commonly used measures of mortise stability in surgery for malleolar fractures, and they continue to study mobility of the first ray in various foot disorders, including hallux valgus, transfer metatarsalgia, lesser metatarsal stress fractures, and second metatarsophalangeal diseases.

**Hand, Upper Extremity, and Microsurgery.** The service continues to provide state-of-the-art care to patients on an inpatient and outpatient basis. Led by Melvin P. Rosenwasser, MD, Director, Trauma Training Center, the team provides hand and upper extremity care to the New York Yankees, as well as to children and adults of all ages. Decellularized allograft is a new option to treat nerve defects that is being offered at NewYork-Presbyterian/Columbia by our hand surgeons. This new technology is also being evaluated in the Microsurgery Research and Training Laboratory by Peter Tang, MD, MPH. This laboratory has become a center for clinically oriented experimental research projects in peripheral nerve repair problems. Robert J. Strauch, MD, has pioneered new methods of treating finger fracture dislocations.

The Trauma Training Center serves as the research arm of the division and is a unique center for translational studies. We continue to gather data for one of the largest distal radius fracture databases in the country. The database has been used to study multiple aspects of distal radius fractures to improve patient care.

**Hip and Knee Replacement.** In the Center for Hip and Knee Replacement, our orthopaedic surgeons are at the forefront of minimally invasive surgical techniques, including robotic technologies, which help to reduce trauma and lead to quicker recovery. Our surgeons are now using a robotic approach that improves the precision of partial knee replacement. The MAKOplasty® procedure involves a robotic surgical arm that the surgeon uses to resurface portions of the knee joint and to place the implant with accurate orientation and alignment.

The program provides the surgeon with a presurgical plan detailing the technique for bone preparation, as well as customized implant positioning using data from a CT scan of the patient’s knee as a guide.

During the procedure, the system creates a 3D virtual view of the patient’s bone surface and correlates the image with a preprogrammed surgical plan. “Using this approach, we’re able to contour the bone perfectly to fit the implant, which will theoretically decrease edge loading, asymmetric wear, and loosening,” notes Jonathan H. Lee, MD.

**Shoulder, Elbow and Sports Medicine.** Louis U. Bigliani, MD, and William N. Levine, MD, were selected as two of the top 25 shoulder surgeons in the United States by Orthopedics This Week. Under their leadership, the Center for Shoulder, Elbow and Sports Medicine has developed a major research program that continues to grow. Center surgeons are evaluating surgical simulations of total shoulder arthroplasty, applying patient-specific three-dimensional computer models of the shoulder from CT scans to determine the proper placement and orientation for surgical instrumentation, implant size, and the depth of cut and volume of bone needed to be removed to ensure proper implant fixation. The Center led a prospective, multicenter evaluation of total shoulder replacements (TSR) for primary glenohumeral arthritis, which demonstrated that TSR is successful for the treatment of this arthritis, with reliable pain relief and improvement in shoulder function.

Under the direction of Edwin Cadet, MD, our researchers have investigated several important concepts in joint preservation surgery of the hip and knee. Recently in the October 2012 issue of the American Journal of Sports Medicine, Dr. Cadet and colleagues investigated the fluid seal properties of hip labral repair, debridement, and reconstruction techniques in a cadaveric model. The authors discovered that hip labral repair outperformed partial labral resection and reconstruction in preserving the joint fluid seal; however, labral repair did not restore fluid seal characteristics as effectively as in the labrum-intact condition. Furthermore, Dr. Cadet and his...
co-authors are investigating the effects of “anatomic” and “conventional” ACL reconstruction on articular contact pressures and knee joint mechanics to elucidate whether one method accelerates or protects against the development of early osteoarthrosis.

**Tumor and Bone Disease.** Under the direction of Francis Y. Lee, MD, PhD, the Department provides expertise in bone and soft tissue sarcomas and continually pursues research for more efficacious treatments, with a focus on reconstruction of skeletal or muscular defects after surgical removal of a tumor, as well as prevention of tumor recurrence.

**Pediatric Orthopaedics.** The Division of Pediatric Orthopaedic Surgery at NewYork-Presbyterian/Morgan Stanley Children’s Hospital, under the leadership of David P. Roye, Jr., MD, offers specialized expertise in the broad spectrum of congenital, developmental, and traumatic disorders affecting bones, soft tissues, joints, and the neuromuscular system. In 2012, the Division launched the Sports Medicine Center for the Developing Athlete, which offers prevention, treatment, and performance-enhancing services for growing athletes. Common injuries and disorders managed include concussions, injuries associated with throwing, knee injuries, and the female athlete triad syndrome. In addition to pediatric orthopaedic specialists and a pediatric sports physiatrist, the Center has certified athletic trainers who educate coaches, trainers, parents, and athletes at regional high schools on minimizing injuries.

The pediatric spine program continues to excel in all areas – clinical care, research, and national visibility. As one of the leading centers for the treatment of early onset scoliosis, the Early Onset Scoliosis Center offers an array of innovative techniques, many of which are not offered elsewhere in New York. This year, Michael G. Vitale, MD, MPH, led the development of a novel classification schema for early onset scoliosis and a best practice guideline for avoiding surgical site infection in spinal surgery – work products that are now widely used nationally. Dr. Vitale was recently conferred with the position of Chairman of the International Pediatric Orthopaedic Symposium, a five-year term that allows him to direct the Symposium’s educational focus. In addition to serving as a Board member of the Pediatric Orthopaedic Society of North America (POSNA), this position allows Dr. Vitale to provide leadership and national governance in the field. In 2012, Dr. Vitale was named among the “Top 17 Pediatric Orthopaedic Surgeons” by *Orthopedics This Week* and the “Top 50 Spine Surgeons” by *Becker’s Review*.

**Research Highlights**

The Center for Orthopaedic Research, directed by Francis Y. Lee, MD, PhD, Vice Chair of Research, provides optimal environments for orthopaedic surgeons to conduct basic, translational, and clinical research.

Michael G. Vitale, MD, MPH, Chief of Pediatric Spine and Scoliosis Surgery and Director of the Pediatric Orthopaedic Research Group for Columbia Orthopaedics, was recently named Chairman of the International Pediatric Orthopaedic Symposium.

**Pediatric Spine and Scoliosis Surgery**

David P. Roye, Jr., MD, Chief of Pediatric Orthopaedic Surgery, also serves as Executive Medical Director of the new Weinberg Family Cerebral Palsy Center. Dr. Roye is a recipient of the American Academy of Orthopaedic Surgeons Humanitarian Award.

**A robust research program funded by important state and federal grants is making inroads in the treatment of tumor and bone diseases. Dr. Lee, one of only a few orthopaedic surgeons in the United States to have received R01 funding from the National Institutes of Health, is investigating the cellular and molecular processes underlying the resistance of musculoskeletal tumors to radiation therapy and chemotherapy, as well as the processes behind inflammatory bone**
loss and prosthetic loosening. In July 2012, Dr. Lee obtained his third NIH grant, a four-year renewal of his first R01 grant, *Mechanobiological Mechanism for Inflammatory Bone Loss*.

NewYork-Presbyterian/Columbia is one of 47 centers participating in the *Transfusion Trigger Trial for Functional Outcomes in Cardiovascular Patients Undergoing Surgical Hip Fracture Repair* (FOCUS) study. A study by Department researchers published in 2011 in *The New England Journal of Medicine* showed no ill effects from postponing transfusion until patients develop signs of anemia or their hemoglobin concentration falls below 8 g/dL.

William B. Macaulay, Jr., MD, Chief, Division of Adult Reconstructive Surgery of the Hip and Knee and a co-author and member of the FOCUS steering committee, noted that the study will help resolve the debate about how much blood patients need after surgery.

In January 2012, researchers published results of a study showing that a reverse shoulder implant improves outcomes in patients with rotator cuff damage. The Department’s orthopaedic surgeons collaborated on a design that changed the angle of the neck of the humeral prosthesis from 65° to 60° and slightly lateralized the center of rotation, reducing the risk of scapular notching and increasing range of motion. They replaced the four screws in the base plate with two flexible angle locking screws to improve glenoid stability. After one year, none of the 67 patients in the study required another surgery, and active forward flexion improved from 61° preoperatively to 121° postoperatively.

In an article published in the January 2013 issue of the *Journal of Shoulder and Elbow Surgery*, orthopaedic surgeons reported on a study evaluating reaming parameters for glenoid-implant surface area and bone loss in total shoulder arthroplasty that demonstrated performing smaller version corrections allows for greater attainable implant-bone surface contact.

To improve the success of rotator repairs, Dr. William Levine, and Helen H. Lu, PhD, have developed and are now evaluating a nanofiber scaffold to facilitate the regeneration of the tendon-to-bone insertion, and in turn, promote the biological fixation of tendon to bone. Unlike conventional rotator cuff devices, the bilayer scaffold is applied as an inlay inserted between the tendon and bone to help them adhere to each other. “What was most exciting is that the histology of the repaired rotator cuff with the scaffold looked like normal tendon-to-bone insertion,” says Dr. Levine. The researchers continue to study tendon-bone fixation strength and long-term functional repair.

Dr. Peter Tang has focused his research on improving nerve regeneration in the challenging clinical setting of a segmental nerve defect. In his first study, Dr. Tang and his colleagues demonstrated the efficacy of matched diameter decellularized allografts in repairing segmental nerve injuries. In a rat model, they showed that this approach is superior to the “cabled autografting” technique. The study’s paper won first prize at the annual Residents and Fellows Research Night of the New York Society for Surgery of the Hand. Based on these findings, Dr. Tang was awarded a basic science grant from the American Society for Surgery of the Hand. In the new study he is evaluating the impact of inflammation on histologic and functional recovery using the same rat sciatic injury model with the repair options being reverse autograft (control), decellularized allograft, or unprocessed allograft. Besides improving nerve regeneration, the results will be used to apply for grants from the OREF and NIH for larger studies.

After observing an alarming increase in the incidence of elbow injuries among young and aspiring baseball players, and requests for the surgery from those without injury, a group of researchers led by Christopher S. Ahmad, MD, undertook a study to assess public perception about Tommy John surgery. “Many young throwers present to my office with interest in the surgery because they believe it will improve their performance, even though they don’t have a significant elbow injury,” says Dr. Ahmad. “Growing evidence indicates that overuse and fatigue related to increased game time and practice are responsible for injury of the ulna collateral ligament. Our study demonstrates that youth players do not believe that overuse is related to injury.”
New Faculty Appointments

The Department of Orthopaedic Surgery is pleased to welcome the following new faculty members.

Joseph P. Dutkowsky, MD, is Associate Medical Director for the Weinberg Family Cerebral Palsy Center. A leading CP specialist and pediatric orthopaedic surgeon, Dr. Dutkowsky earned his MD from the Warren Alpert Medical School of Brown University, followed by residency training at Dartmouth-Hitchcock Medical Center and The University of Tennessee/Campbell Foundation, and the United Cerebral Palsy Fellowship at Harvard University and Children’s Hospital in Boston. He has since dedicated his career to developing hospitals and community clinics throughout upstate New York to care for rural children and adults with disabilities. In 2011, Dr. Dutkowsky served as President of the American Academy for Cerebral Palsy and Developmental Medicine, and currently serves on the Board of Directors of the Cerebral Palsy Associations of New York State.

Charla R. Fischer, MD, specializes in the operative and non-operative treatment of spinal disorders in adolescents and adults. Her expertise includes the care of degenerative disc disease of the cervical and lumbar spine, herniated discs, scoliosis, spondylolisthesis, trauma, and tumors, with a particular focus on minimally invasive surgical techniques. Dr. Fischer received her medical degree at the University of Southern California, Los Angeles, and completed a residency in orthopaedic surgery at NewYork-Presbyterian/Columbia and a fellowship in spine surgery at Hospital for Joint Diseases. Her research focuses on the biology of spinal fusion, as well as outcomes following lumbar spondylolisthesis surgery, anterior lumbar surgery, and adult deformity surgery. Dr. Fischer is committed to international medical care, and she is actively involved in the mentoring and training of medical students and residents.

Charles M. Jobin, MD, brings expertise in the operative and non-operative treatment of shoulder and elbow disorders in adults, with an emphasis on shoulder and elbow reconstruction and minimally invasive and arthroscopic techniques. His particular clinical interests include treatment of shoulder and elbow arthritis, joint replacement, rotator cuff disorders, shoulder instability, tendon and ligament injuries, and fractures. His research focuses on optimization of shoulder replacement outcomes, rotator cuff repair, and tendon injuries. Dr. Jobin earned his medical degree at the University of Colorado School of Medicine and went on to complete his residency in orthopaedic surgery at NewYork-Presbyterian/Columbia before pursuing fellowship training in shoulder and elbow surgery at Washington University. He was a participant in the Emerging Leader Program of the American Orthopaedic Association.

Charles A. Popkin, MD, is a member of the Department’s newly launched Sports Medicine Center for the Developing Athlete, where he provides expertise in arthroscopic and open procedures of the knee, shoulder, elbow, ankle and hip, as well as pediatric fracture care. Dr. Popkin received his medical degree at Tulane University School of Medicine, and completed his residency in orthopaedic surgery at the University of Miami/Jackson Memorial Hospital, where he served as Chief Resident. During training in Miami, Dr. Popkin developed a passion for sports medicine involving the growing athlete. Pursuing this area of clinical interest, he completed a sports medicine fellowship at the Minnesota Orthopedic Sports Medicine Institute and a second fellowship in pediatric orthopaedics at Hospital for Sick Children in Toronto.