

OCTOBER/NOVEMBER 2013

2 New Accreditation System for Resident Evaluation

3 Columbia Orthopaedic Surgeon Brings Skills to Vietnam

5 Study Shows Obesity Raises Knee Replacement OR Time

6 Kumar Kadiyala Brings Upper Extremity Surgical Expertise to Columbia

6 New and Noteworthy

Visit columbiaortho.org to register and receive updates on:

- clinical advances
- research news
- upcoming CMEs

Intraoperative Navigation Enhances Outcomes of Pediatric Spine Surgery

Michael G. Vitale, MD, MPH

Spine surgery requires extraordinary precision. Complex spine deformities in young children present a particular technical challenge. Intraoperative surgical navigation is one of many tools used by the pediatric spine surgeons at NewYork-Presbyterian/Morgan Stanley Children's Hospital/Columbia University Medical Center to optimize outcomes for young patients.

"Surgical navigation has become a reality in the treatment of pediatric spine disorders," said Michael G. Vitale, MD, MPH. "We have taken the surgical navigation techniques developed for adult patients and adapted them to the smaller anatomy of the pediatric spine. This technology has been around for a while, and we are now seeing an opportunity to adapt it to the special needs of our patients."

Dr. Vitale, Chief of Pediatric Spine and Scoliosis Surgery at NewYork-Presbyterian/Morgan Stanley Children's Hospital, leads the busiest pediatric spine surgery group in New York City, offering the full gamut of non-operative and operative choices for children with spinal deformities.

"Surgical navigation is the newest addition to our toolbox of treatment options for children

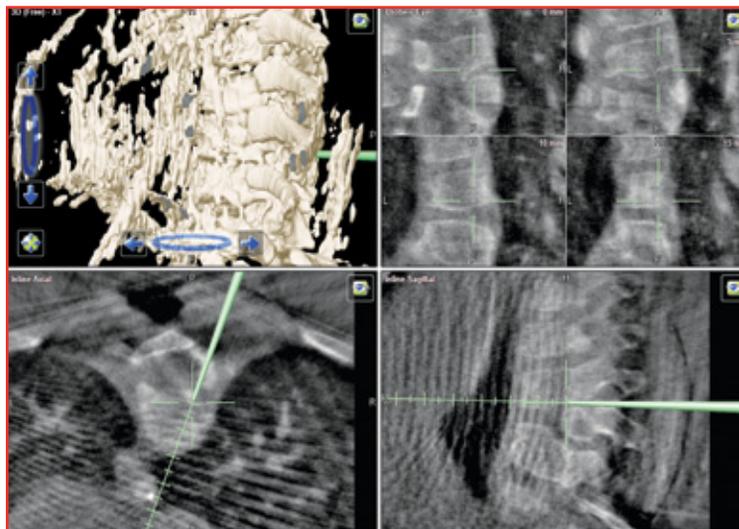
with scoliosis," explained Dr. Vitale. That toolbox also includes many techniques for the treatment of early-onset scoliosis, such as growing rods and VEPTR, anterior vertebral stapling to reverse scoliosis in the growing child, and Mehta casting for infantile scoliosis.

"Surgical navigation not only enables us to operate more quickly, but also more safely because we can see exactly where our instruments are going."

— Michael G. Vitale, MD, MPH

Surgical navigation relies on the use of three-dimensional fluoroscopic imaging in the operating room, connected to a BrainLab computer. "We can scan the patient intraoperatively, see the anatomy in the OR, and use that information to navigate the placement of instrumentation that needs to be positioned precisely," Dr. Vitale explained. This method has allowed surgeons to achieve the highest possible safety margin on the

(continued on page 3)



Surgical navigation uses three-dimensional fluoroscopic imaging in the operating room connected to a BrainLab computer, and helps spine surgeons navigate the precise placement of instrumentation in the pediatric spine.



COLUMBIA UNIVERSITY

College of Physicians
and Surgeons

New Accreditation System for Resident Evaluation

William N. Levine, MD



Until recently, hospital residency programs around the country were required to submit volumes of data every five years to re-apply for accreditation and prepare for an on-site visit by the Residency Review Committee (RRC) of the Accreditation Council for Graduate Medical Education (ACGME). On July 1, 2013, the ACGME RRC began piloting a new system that requires residency programs to submit data continuously and to promote and graduate residents only if they meet a set of objective criteria. The new system results in a 10-year period of accreditation. Orthopaedic surgery is one of the seven specialties selected to start using this new system.



William N. Levine, MD, is Program Director for the Orthopaedic Surgery Residency at NewYork-Presbyterian/Columbia University Medical Center.

“The original Program Information Form we used to submit was a 200-page tome that required incredible amounts of detail to substantiate that our program was worthy of re-accreditation,” explained William N. Levine, MD, Program Director for the Orthopaedic Surgery Residency at NewYork-Presbyterian/Columbia University Medical Center.

“The ACGME and RRC began to ask, ‘Is this really the best way we should be accrediting institutions to train doctors? Are we getting a fluid sense of what is going on?’”

After much discussion, the ACGME developed the Next Accreditation System (NAS), which Dr. Levine called “the most revolutionary change in medical education monitoring and accreditation in decades.” The NAS is a more modern way of managing data submission via continuous updates submitted electronically, including the results of anonymous annual surveys of residents and faculty members.

The Next Accreditation System developed by the ACGME seeks to:

- Enhance the ability of the peer review system to prepare physicians for practice in the 21st century
- Accelerate the ACGME’s movement toward accreditation on the basis of educational outcomes
- Reduce the burden associated with the former structure and process-based approach

A key component of the NAS are 16 milestones – measurable criteria used to assess the competence of residents. “One of the biggest challenges in medical education has been the lack of true metrics and objective criteria to say to society, ‘We are graduating

“The Next Accreditation System is the most revolutionary change in medical education monitoring and accreditation in decades.”

— William N. Levine, MD

residents who can practice independently,” explained Dr. Levine. “Our former evaluations also did not tell us if someone was truly ready to move forward from one year of residency to the next.”

The new milestones should help resolve this dilemma by rating residents against five levels of ability: novice, advanced beginner, competent, proficient, and expert. Residents will be required to attain the level of “proficient” for all milestones by the time of graduation. An example of an orthopaedic surgical milestone would be a particular procedure, such as reconstruction of the anterior cruciate ligament.

“With this new system, we can give our residents objective feedback as they move along in their training. We can tell them, ‘Here’s what you need to be shooting for,’” noted Dr. Levine. “This is better for patient care and for society, because we can confidently say that a resident has reached the level of proficiency and is ready to graduate.”

Accreditation of a program is based on the proportion of residents who pass the boards and meet the NAS milestones, real-time data that are submitted, and survey results. Any “red flags” that are raised during data collection may trigger a special site visit by the RRC; otherwise, if the program appears to be in good standing and meeting the milestones, the site visit will take place every 10 years. It is critical that program directors and coordinators are honest in the submission of their data. “We don’t want program directors saying that all of their graduating residents attained proficiency just to avoid red flags and an early site visit,” said Dr. Levine.

NewYork-Presbyterian/Columbia has formed a Clinical Competency Committee (CCC), chaired by Jeffrey A. Geller, MD, to help Dr. Levine and Department of Orthopaedic Surgery Chairman Louis U. Bigliani, MD, make critical decisions and assist with the measurement and reporting of milestones. The CCC will meet monthly as this new program is unveiled and will file its first report to the ACGME by December 1, 2013, indicating that the committee has met and reviewed the milestones and outlining how the residents are doing in meeting them. Another CCC report is due six months later.

While the NAS and the milestones are not yet validated, Dr. Levine contended that real-time reporting and the use of objective milestones will likely generate proficient surgeons, improving patient care. “It’s a whole new world,” he concluded. “Change always makes people nervous, but I think at the end of the day, it will be better.”

For More Information

William N. Levine, MD • wnl1@columbia.edu

Intraoperative Navigation Enhances Outcomes of Pediatric Spine Surgery *(continued from page 1)*

many complex patients who are referred to NewYork-Presbyterian/Morgan Stanley Children's Hospital. Dr. Vitale's surgical navigation program was extensively highlighted in the 2012 "Best Doctors" issue of *New York Magazine*.

Surgical navigation allows him and his fellow surgeons to measure screws and other instrumentation in the OR and provides them with more control during surgery than they've ever had before. The operating time is often reduced, typically by about 20 percent (a number which varies among patients and procedures), while enhancing patient safety by permitting the surgeon to avoid injuring nearby healthy tissues.

"Surgical navigation not only enables us to operate more quickly, but also more

safely because we can see exactly where our instruments are going," said Dr. Vitale. "Everything we do is driven by our intent to maximize safety."

That intent has resulted in one of the lowest postoperative infection rates in the nation – achieved not only with the use of navigation, but also a dedicated Quality Committee, led by Pediatric Nurse Practitioner Jen Crotty. The Committee's main focus is on quality of care and enhanced patient outcomes. "We have built an infrastructure around quality and created a quality dashboard with checklists to provide the best care to each patient," Dr. Vitale noted. "Our use of surgical navigation is just one component of our broader 'best in breed' approach to pediatric spine surgery." Surgical volume in the practice has

increased by 20 percent per year since his arrival 11 years ago. "Volume very much drives quality and allows us to develop standardized processes aimed at maximizing the care of our patients," he added.

Dr. Vitale's partners – Joshua E. Hyman, MD, Benjamin Roye, MD, David P. Roye, Jr., MD, and Charles Popkin, MD – are exploring the use of surgical navigation in other areas of pediatric orthopaedics, including hip and knee surgery and sports medicine. Dr. Vitale concluded, "We're just scratching the surface in seeing how we can use surgical navigation to improve the care of children undergoing orthopaedic surgery."

For More Information

Michael G. Vitale, MD, MPH • mgvl@columbia.edu

Seventeen Surgeries in Five Days: Columbia Orthopaedic Surgeon Brings Skills to Vietnam J. Turner Vosseller, MD



June 2013 wasn't the first time J. Turner Vosseller, MD, had been to Vietnam – he'd visited before on a vacation in 2009 – but it did mark his first visit as an orthopaedic surgeon. Over the course of five days, he and his colleague, Aaron Guyer, MD, of Tallahassee, Florida, treated 55 patients and performed 17 surgeries for local residents who were greatly appreciative of the care they received.

The trip was organized by the American Orthopaedic Foot and Ankle Society (AOFAS) in partnership with the Prosthetics Outreach

Foundation (POF), which has been providing prosthetic limbs to Vietnamese children and adults since the 1990s. The AOFAS has been bringing surgeons to the country for four weeks every year since 2002, transforming the lives of hundreds of Vietnamese children and adults with lower extremity deformities and disabilities through corrective surgery. Teams of visiting AOFAS members volunteer their own time, pay their own travel expenses, and work side by side in clinics and operating rooms with Vietnamese orthopaedic surgeons and residents as part of an educational exchange.

(continued on page 4)



Columbia Orthopaedic Surgeon Brings Skills to Vietnam *(continued from page 3)*

Dr. Vosseller had previously donated his surgical skills in Tanzania and is on the Humanitarian Services Committee of the AOFAS, which connected him with the Vietnamese opportunity. He and his fellow surgeons arrived in Thai Nguyen, a small town about two and a half hours northwest of Hanoi, on June 16. It is home to an orthopaedic and rehabilitation hospital that was built in collaboration with the Czech Republic (explaining why the Czech flag is prominently displayed at the facility).

The AOFAS and POF together created an infrastructure in Vietnam that is often lacking in overseas surgical missions. So Dr. Vosseller had the resources he needed to get right to work. “One of the issues with these medical trips is the lack of operating room and anesthesiology equipment and materials that we are used to working with here in the States. But the way it is set up by the POF in Vietnam, it works very well,” he noted.

Many of the patients he treated were children and adolescents with cerebral palsy and other neuromuscular pathologies, for which Dr. Vosseller performed several tendon transfers. In other cases, the surgeons saw patients whom they could not help on this trip, such as those with untreated or undertreated club feet and one girl with bilateral congenital dislocated hips. “Part of our task was figuring out what we could do and what we shouldn’t do,” said Dr. Vosseller. “You have to treat what you can make better.”

Many of the patients who came to the Thai Nguyen clinic traveled from distant villages, hearing via word of mouth about the surgeons coming to their area. Some journeyed from northern and western mountain towns, near the Laos and China borders. Translators were provided to help the surgeons communicate with their patients. The orthopaedic hospital provided rooms for them to recover as well as beds for family members traveling with them.

The visiting surgeons took care of 40 patients and performed 13 surgeries over three days. They then traveled to Hanoi, where they cared for 15 more patients and completed four operations over two days. Dr. Vosseller found the experience to be culturally eye opening. For example, “The patients there don’t take much pain medicine after surgery,” he said. “They don’t expect to get pain medications, so they just deal with it.”

He plans to return to Vietnam on a future mission. “As orthopaedic surgeons, we have special abilities that not many people can offer,” he concluded. “It’s fulfilling to be able to use my skills to help improve the lives of people who would not otherwise be able to get them.”

For More Information

J. Turner Vosseller, MD • jtv2111@columbia.edu

Study Shows Obesity Raises Knee Replacement OR Time

Jeffrey A. Geller, MD

It's known that obesity raises the risk of osteoarthritis as well as complications following knee replacement surgery. Orthopaedic surgeons at NewYork-Presbyterian/Columbia University Medical Center have now shown, for the first time, that obesity also increases operating room time during knee replacement surgery. The findings were published in the April 2013 issue of the *Journal of Arthroplasty*.

Led by Jeffrey A. Geller, MD, Co-Chief, Division of Hip and Knee Reconstruction, the investigators retrospectively analyzed data for 273 patients (76 men and 197 women) who had undergone total knee replacement between 2005 and 2012 at NewYork-Presbyterian/Columbia, stratifying them by body mass index (BMI). They found that for every 1 kg/m² increase in BMI, OR time rose by 0.933 minutes. For example, operative time was 97.26 minutes for patients with a normal BMI, 103.28 minutes for obese patients with a BMI of 30 to 34.9 kg/m², and 114.5 minutes for morbidly obese patients (BMI of 40 kg/m² or more).

"Every additional minute in the OR raises the risk of infection and impaired wound healing," said Dr. Geller. Indeed, that turned out to be the case in this



Orthopaedic surgeons at NewYork-Presbyterian/Columbia University Medical Center reported that obesity increases operating room time during knee replacement surgery.

Body Mass Index and Operative Time During Total Knee Replacement

BMI (KG/M2)	Operative Time (minutes)
18 - 24.9	97.26
25 - 29.9	97.24
30 - 34.9	103.28
35 - 39.9	105.74
40 or more	114.50

study, with the incidence of postoperative skin and wound infections being greatest among patients with a BMI of 35 kg/m² or more. Obese patients were also more likely to develop arthrofibrosis (scar tissue in the knee that causes stiffening of the joint) requiring manipulation under anesthesia. Surgical complications also translate to a longer recovery time for patients to return to their presurgical baseline health levels.

The main reason OR time rises in obese patients comes down to mechanics: It takes the surgeon longer to get through the deeper layers of tissue in someone who has excess skin and body fat. "It takes more work to expose the operative field in a patient who is obese, and this makes the surgery last longer," noted Dr. Geller.

Obese patients presenting for knee replacement surgery also tended to be younger than normal and overweight patients. Non-obese patients had a mean age at operation of 69.31 years, while obese patients had a mean age of 62.9 years. This finding supports those of other investigations showing that obesity is a significant risk factor for the earlier development of debilitating osteoarthritis of the knee. Patient satisfaction and well-being after recovering from surgery was similar among all weight groups.

In addition to raising the risk of complications, a longer OR time draws on hospital resources. "Higher utilization of OR time and materials affect insurance

reimbursement rates," Dr. Geller added. He's also concerned that in our healthcare cost-conscious society, obese patients could be turned down for reimbursement for knee replacement surgery if the risk of complications is deemed to be too high by virtue of their weight.

"Every additional minute in the OR raises the risk of infection and impaired wound healing."

— Jeffrey A. Geller, MD

The take-home message: Doctors should encourage their obese patients to lose weight before knee replacement surgery. "Physicians should have a serious conversation with their patients to let them know they are making the surgery more dangerous by putting themselves at risk of postsurgical complications if they don't lose weight," concluded Dr. Geller. "If we can empower patients to take that warning seriously and to lose weight before surgery, that's the best thing we can do."

Reference Article

Liabaud B, Patrick DA Jr, Geller JA. Higher body mass index leads to longer operative time in total knee arthroplasty. *Journal of Arthroplasty*. 2013 Apr;28(4):563-65.

For More Information

Jeffrey A. Geller, MD • jgeller@columbia.edu

Kumar Kadiyala Brings Upper Extremity Surgical Expertise to Columbia

NewYork-Presbyterian/Columbia University Medical Center has announced the appointment of R. Kumar Kadiyala, MD, PhD, as Assistant Professor of Orthopaedic Surgery and Chief of the Orthopaedic Service at The Allen Hospital. Dr. Kadiyala has specialty training in hand and upper extremity surgery, hip and knee replacement, and orthopaedic trauma. He led the hand surgery service at Mount Sinai Medical Center in Miami, Florida, before joining the NewYork-Presbyterian/Columbia faculty in September.



Kumar Kadiyala, MD, PhD, new Chief of the Orthopaedic Service at NewYork-Presbyterian/Allen, specializes in adult and pediatric brachial plexus injuries.

Dr. Kadiyala co-directed the shoulder and elbow service at the University of Iowa and conducted research on the molecular biology of peripheral nerve injuries before starting his practice in Miami. He is a specialist in brachial plexus surgery in infants and children, as well as adults who require this surgery after experiencing trauma. Dr. Kadiyala hopes to establish a center at NewYork-Presbyterian/Columbia specializing in brachial plexus surgery for patients of all ages. He also plans to conduct clinical research on upper extremity surgical outcomes.

He trained as a resident with several of the orthopaedic surgical faculty of Columbia. “To be able to join a faculty with that level of prestige is very gratifying. I can’t ask for better colleagues,” said Dr. Kadiyala. “They are an extraordinarily accomplished group who are highly regarded in academic circles. There is an exceptional tradition of excellence at Columbia that has existed for decades, and it is an honor for me to be a part of it.”

For More Information

R. Kumar Kadiyala, MD, PhD
rkk2121@columbia.edu

“There is an exceptional tradition of excellence at Columbia that has existed for decades, and it is an honor for me to be a part of it.”

— Kumar Kadiyala, MD, PhD

Dr. Kadiyala was born in India and raised in Indiana, where his father was an economics professor at Purdue University. He went to medical school at Stanford University, where he earned MD and PhD degrees in the Medical Scientist Training Program and conducted National Institutes

of Health-funded molecular immunology research related to cancer. He then completed a residency in orthopaedics at the Harvard Combined Orthopaedic Program and fellowships in orthopaedic trauma and hand/upper extremity surgery at Massachusetts General Hospital, Brigham & Women’s Hospital, and Boston Children’s Hospital. He also completed a fellowship in adult reconstruction (hip and knee replacement) at Beth Israel Deaconess Medical Center in Boston.

New and Noteworthy



Christopher S. Ahmad, MD, head of the Sports Medicine Center for the Developing Athlete, held a live surgical shoulder labral repair during the 2013 Annual Meeting of the American Orthopaedic Society for Sports Medicine, held in July.

Orthopaedic surgeons **Charla R. Fischer, MD**, and **Francis Y. Lee, MD, PhD**, Vice Chairman of Research of the Department of Orthopaedic Surgery, received an NIH Research Supplements award to promote diversity in health-related research. As part of an NIH-wide program, principal investigators holding National Institute of General Medical Sciences research grants may request supplemental funds to improve the diversity of the research workforce by supporting and recruiting students and postdoctoral fellows from underrepresented racial and ethnic groups; individuals with disabilities; and individuals from socially, culturally, economically, or educationally disadvantaged backgrounds that have inhibited their ability to pursue a career in health-related research.

Thomas R. Hickernell, MD, the Translational Research in Orthopaedics fellow of the Center for Orthopaedic Research, has received a Resident Research Project Grant from the Orthopaedic Research and Education Foundation for his proposal “Investigation of the mechanism of action and a novel therapeutic application of a caspase 1 inhibitor in the setting of inflammatory osteolysis.” The study’s long-range goal is to preserve and enhance bone quality in diverse conditions that lead to pathologic inflammatory osteolysis.

Advances in Adult and Pediatric Orthopaedics is published by NewYork-Presbyterian Hospital. The articles in this newsletter represent the work of Columbia University College of Physicians and Surgeons faculty at NewYork-Presbyterian/Columbia University Medical Center, who are at the forefront of research and practice in the diagnosis, treatment, and rehabilitation of musculoskeletal conditions in adults and children.

Editorial Board

J. Turner Vosseller, MD

Editor-in-Chief

Assistant Attending Orthopaedic Surgeon
Assistant Professor of Clinical Orthopaedic Surgery
Department of Orthopaedic Surgery
jtv2111@columbia.edu

Louis U. Bigliani, MD

Chief, Orthopaedic Surgery Service
Director, Center for Shoulder, Elbow and Sports Medicine
President, ColumbiaDoctors
Frank E. Stinchfield Professor and Chairman
Department of Orthopaedic Surgery
lub1@columbia.edu

Francis Y. Lee, MD, PhD

Chief, Musculoskeletal Oncology
Vice Chair for Research
Professor with Tenure
Department of Orthopaedic Surgery
fl127@columbia.edu

William N. Levine, MD

Residency Program Director, Orthopaedic Surgery
Chief, Shoulder Service
Co-Director, Center for Shoulder, Elbow and Sports Medicine
Vice Chairman of Education
Professor of Clinical Orthopaedic Surgery
Department of Orthopaedic Surgery
wnl1@columbia.edu

William B. Macaulay, Jr., MD

Director, Center for Hip and Knee Replacement
Chief, Division of Adult Reconstructive Surgery for the Hip and Knee
Nas S. Eftekhari Professor of Clinical Orthopaedic Surgery
Department of Orthopaedic Surgery
wm143@columbia.edu

Melvin P. Rosenwasser, MD

Director, Hand and Orthopaedic Trauma Services
Robert E. Carroll Professor of Clinical Orthopaedic Surgery
Department of Orthopaedic Surgery
mpr2@columbia.edu

Contributing Faculty

Jeffrey A. Geller, MD

Co-Chief, Division of Hip and Knee Reconstruction
Director of Research, Center for Hip and Knee Replacement
Associate Professor of Clinical Orthopaedic Surgery
Department of Orthopaedic Surgery
jgeller@columbia.edu

R. Kumar Kadiyala, MD, PhD

Chief, Orthopaedic Service
NewYork-Presbyterian/The Allen Hospital
Assistant Professor of Orthopaedic Surgery
Department of Orthopaedic Surgery
rkk2121@columbia.edu

William N. Levine, MD

Residency Program Director, Orthopaedic Surgery
Chief, Shoulder Service
Co-Director, Center for Shoulder, Elbow and Sports Medicine
Vice Chairman of Education
Professor of Clinical Orthopaedic Surgery
Department of Orthopaedic Surgery
wnl1@columbia.edu

Michael G. Vitale, MD, MPH

Associate Chief, Division of Pediatric Orthopaedics
Chief, Pediatric Spine and Scoliosis Surgery
NewYork-Presbyterian/Morgan Stanley Children's Hospital
Ana Lucia Professor of Clinical Orthopaedic Surgery
Department of Orthopaedic Surgery
mgv1@columbia.edu

J. Turner Vosseller, MD

Assistant Attending Orthopaedic Surgeon
Assistant Professor of Clinical Orthopaedic Surgery
Department of Orthopaedic Surgery
jtv2111@columbia.edu

Advances in Adult and Pediatric Orthopaedics

NewYork-Presbyterian/
Columbia University Medical Center
Department of Orthopaedic Surgery
622 West 168th Street
New York, NY 10032

columbiaortho.org

NON-PROFIT ORG.
US POSTAGE
PAID
STATEN ISLAND, NY
PERMIT NO. 169

Important News from NewYork-Presbyterian/ Columbia Orthopaedics

Visit columbiaortho.org
to register and receive
updates on:

- clinical advances
- research news
- upcoming CMEs

