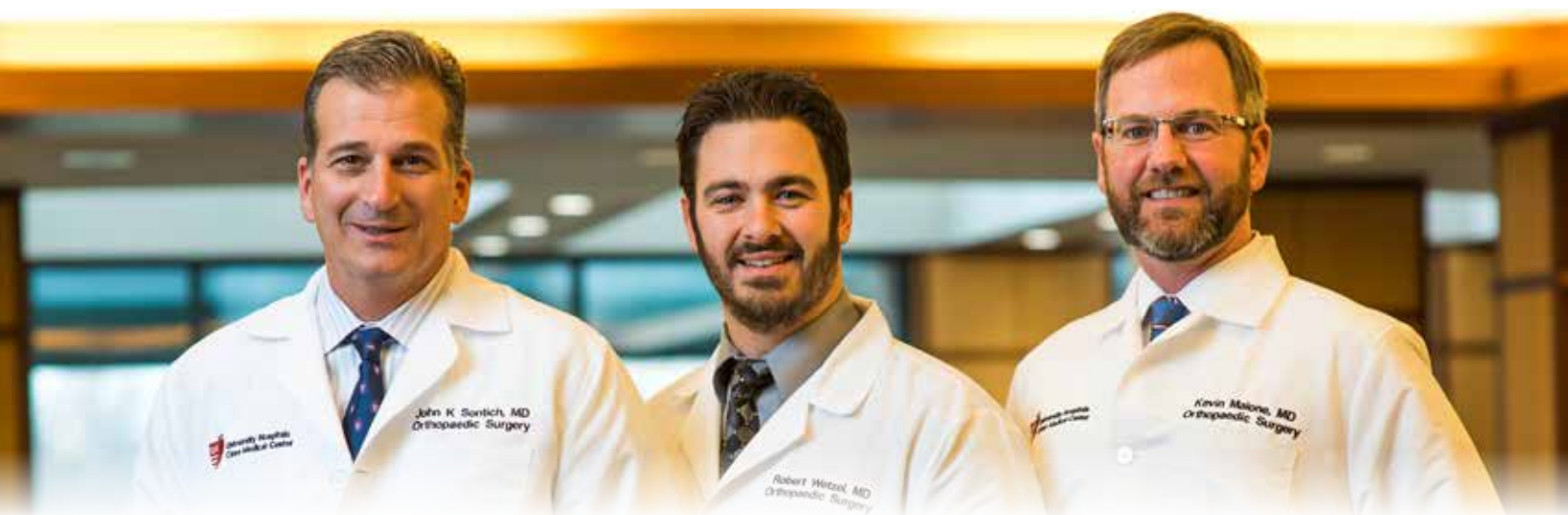


INNOVATIONS IN ORTHOPAEDICS



Leading the Way in Orthopaedic Trauma and Post-Traumatic Reconstruction

UH Case Medical Center now
a Level 1 trauma center

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Wearable Tech

A Message from the Chairman

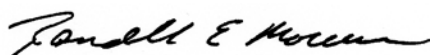
This is a very exciting time for our orthopaedic department: after two years of planning and recruiting, we now have an orthopaedic trauma room staffed 24/7. It's just one of the many highlights you'll read about in this issue of Innovations in Orthopaedics.

On Dec. 1, 2015, University Hospitals Case Medical Center formally became a Level 1 trauma center, expanding our services so that we can provide total care for every aspect of injury, from prevention through rehabilitation. That investment elevates our entire hospital system so that we are now a comprehensive, regional resource for our community, providing tremendous expertise for treating our patients as well as outstanding educational and research opportunities for our medical students and residents.

As part of the expansion, we're pleased to welcome three traumatologists to our collaborative team of specialists. John Sontich, MD, Chief of the Division of Orthopaedic Trauma and Post-Traumatic Reconstruction and Associate Professor of Orthopaedics at Case Western Reserve University School of Medicine, brings a wealth of experience in post-traumatic deformity correction. There are very few places in the country that specialize in this very complicated surgery, and he joins pediatric orthopaedic surgeon Raymond Liu, MD, to provide our adult patients with this specialty care. Kevin Malone, MD, Chief the Division of Hand and Upper Extremity and Associate Professor of Orthopaedics at Case Western Reserve University School of Medicine, has a decade of experience in this specialty practice with an aggressive research agenda. Robert Wetzel, MD, practicing in the Division of Orthopaedic Trauma and Post-Traumatic Reconstruction and Assistant Professor of Orthopaedics at Case Western Reserve School of Medicine, focuses particularly on complex fractures, whether they arise in multiple injured patients or in regards to hip preservation.

Our case study features the expanding realm of wearable technology – from pedometers to heart monitors – and research by James Voos, MD, Chief of the Division of Sports Medicine, Jack and Mary Herrick Endowed Director of Sports Medicine, and Head Team Physician for the Cleveland Browns, and Associate Professor of Orthopaedics at Case Western Reserve University School of Medicine. For the first time, wearable technology enables researchers to monitor and calculate the forces on the body in real time. The research question is whether there's predictive power in the data so that athletes can get feedback in order to prevent or reduce risk of injury.

As always, we welcome your comments, questions and suggestions. Feel free to contact us via email, phone or our professional referral service.



RANDALL E. MARCUS, MD

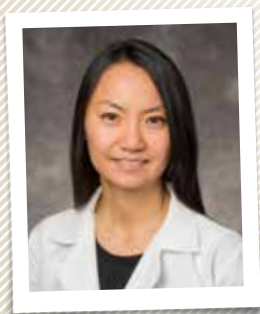
*Charles H. Herndon Professor and Chairman
Department of Orthopaedics
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Case Western Reserve University
School of Medicine*

Department News

Year after year, members of the Department of Orthopaedics at University Hospitals Case Medical Center are recognized for their outstanding achievements. This year, our joint replacement program is also recognized. "The Joint Commission Recertification once again honored us for having one of the best joint replacement programs in the country, thanks to the exceptional work by the whole team of doctors, nurses and physical therapists," says Randall Marcus, MD, Charles H. Herndon Professor and Chairman, Department of Orthopaedic Surgery, UH Case Medical Center and Case Western Reserve University School of Medicine.

Growth and Development

University Hospitals has taken sole ownership of St. John Medical Center in Westlake, on Cleveland's Westside, providing the full range of inpatient and outpatient services, including orthopaedics.



Beverly Guo, MD, an alumna of the School of Medicine, joined our department in early January. She completed her residency at New York University's Hospital for Joint Disease, her hand fellowship at the University of Utah, and is moving her hand surgical practice here from New York. We welcome her back!

Prestigious Awards

Raymond Liu, MD, of UH Rainbow Babies & Children's Hospital and Assistant Professor of Orthopaedics and Pediatrics at the School of Medicine, has been recognized as the initial recipient of the Victor Goldberg Master Clinician Scientist. "Together, Dr. Goldberg and I decided that Dr. Liu deserved this tremendous honor. He is a true clinician-scientist following in the footsteps of Dr. Goldberg," says Dr. Marcus. "We're very thankful to Dr. Goldberg's colleagues, friends, patients, and – most importantly – the Goldberg family for funding this award that will help Dr. Liu discover new and better ways of treating patients."

In sports medicine, James Voos, MD, Chief of the Division of Sports Medicine at UH Case Medical Center and Head Team Physician for the Cleveland Browns, has been named the first Jack and Mary Herrick Endowed Director of Sports Medicine. "We're very grateful to the Herrick family, who are leaders in funding our sports medicine initiative," says Dr. Marcus. "This endowed directorship both honors a sports medicine expert and enables his fabulous educational and clinical research work."

Receiving the University Hospitals Society of 1866 Mather Distinguished Physician Award is George Thompson, MD, Division Chief of Orthopaedic Surgery at UH Rainbow Babies & Children's Hospital and Professor of Orthopaedics at the School of Medicine. "This is the highest award UH Case Medical Center provides to recognize a physician's lifetime contributions," says Dr. Marcus, "and we're so proud of Dr. Thompson, who is one of the leading pediatric orthopaedic surgeons in the world."

The American Shoulder & Elbow Surgeons have awarded the Charles S. Neer Award – the society's highest award for research – to Robert Gillespie, MD, Chief of Shoulder and Elbow Service at UH Case Medical Center and Assistant Professor of Orthopaedics at the School of Medicine. "This award recognizes Dr. Gillespie, an outstanding shoulder and elbow surgeon, for devising new techniques in shoulder surgery," says Dr. Marcus. Dr. Gillespie's investigative work with Ozan Akkus, PhD, in the Orthopaedic Mechanics and Materials Laboratory and Associate Professor of Mechanical and Aerospace Engineering and Biomedical Engineering at Case Western Reserve University, has earned a \$1.7 million grant from the National Institutes of Health to find new ways to repair rotator cuff tears by growing replacement tissue for tendons.

Representing and Serving the Profession

Taking a place on the national stage for the orthopaedics profession is Matthew Kraay, MD, Director of UH Case Medical Center's joint reconstruction and arthritis surgery department and Center for Joint Replacement and Preservation. Dr. Kraay, who is also the Kingsbury G. Heiple and Fred A. Lennon Chair in Orthopaedics and Professor of Orthopaedics at the School of Medicine, was appointed to the Board of Commissioners for the American Joint Replacement Registry. "This appointment puts Dr. Kraay in a very important role for our profession as we try to create a registry for all patients with joint replacements, which will better allow our profession to track outcomes," says Dr. Marcus. "It's great that he was recognized among all the joint replacement surgeons in the country."

Having additionally served the orthopaedics profession as chairman of the board of directors for the journal *Clinical Orthopaedics and Related Research*, Dr. Marcus has been re-elected to his second four-year term. "I'm truly honored to chair the board of one of the top orthopaedic journals in the world," says Dr. Marcus.

LEADING THE WAY

in Orthopaedic Trauma and Post-Traumatic Reconstruction



UH Case Medical Center is now
a Level 1 trauma center



RANDALL MARCUS, MD

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JOHN SONTICH, MD

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To become a Level 1 trauma center, University Hospitals Case Medical Center made a significant investment that elevates not only the services of the emergency room, but those of the full hospital as well, including operating rooms, radiology and the orthopaedics department. “It’s also allowed us to recruit some outstanding traumatologists,” says Randall Marcus, MD, Charles H. Herndon Professor and Chairman of the Department of Orthopaedic Surgery.

Expert Leadership

Under the leadership of John Sontich, MD, Chief of the Division of Orthopaedic Trauma, and Kevin Malone, MD, Chief of the Division of Hand and Upper Extremity, the orthopaedics department now offers an expanded range of services, with exceptional expertise in the areas of limb salvage, post-traumatic reconstruction, and treatment of complex fractures. Both chiefs were recruited from Cleveland’s MetroHealth Medical Center.

“With the loss of the Huron Road Hospital, one of the things that motivates me,” says Dr. Sontich, “is to provide Level 1 trauma care to the Eastside of Cleveland.” In addition, Dr. Sontich hopes those community members will call on his team for post-traumatic reconstruction services as well. “There are a lot of patients who have chronic, debilitating problems from malunited and nonunited fractures – both children and adults,” he says. Dr. Sontich joins pediatric orthopaedic surgeon Raymond Liu, MD, in providing expertise in post-traumatic reconstruction.

A Bold Vision

“Providing these services is a very important part of what we’re here to do at UH,” says Dr. Sontich. “We now have the unique expertise to make University Hospitals a national referral center for post-traumatic reconstructive surgery,” says Dr. Sontich, “because of our location, the partnerships with Cleveland’s academic centers, and having both pediatric and adult trauma centers in the same institution.”

With more than two decades of experience in orthopaedic trauma, Dr. Sontich is – and describes himself as – “one of the elder statesmen” in the field, with an international reputation in limb salvage as well as the highest regard of his peers. He has served as past president of the International Limb Lengthening Reconstruction Society, among many other honors. His vision for the Division of Orthopaedic Trauma and Post-Traumatic Reconstruction is to develop a nationally ranked orthopaedic trauma center that cares for patients from the moment of first response through post-traumatic reconstruction and patient rehabilitation. “We are providing outstanding care, utilizing the newest of technologies to give patients the best outcomes,” says Dr. Sontich. The overall goal is to serve the community better, “and not just locally,” he says, “but regionally, as a major place of referral.”

Expanding Services and Expertise

Since Dec. 1, 2015, at anytime day or night, the orthopaedic trauma team at UH Case Medical Center is ready to care for patients whatever their injury. A new, specialized operating room is purposefully designed and equipped to treat orthopaedic trauma patients – the kind of emergencies that literally threaten life and limb.

“The most urgent cases,” explains Dr. Sontich, “are any injury that includes massive blood loss, such as complex pelvic fractures.” Having committed the resources, UH Case Medical Center is fully prepared to treat these patients. Most medical centers lack the expertise, says Dr. Sontich, “as only a few orthopaedic surgeons are trained in the treatment of these life-threatening, high-energy fractures.”

Emphasizing that point further, Robert Wetzel, MD, says, “Very few people do what I do.” A traumatologist, Dr. Wetzel was also recruited as part of the University Hospitals’ expansion effort. Focusing on complex fractures, whether arising in multiple-injured patients or in regard to hip preservation, Dr. Wetzel says that in emergency situations “orthopaedic problems usually take a back seat to stabilizing the patient, but there are situations when orthopaedic trauma surgeons will take the lead. “And if someone has high-energy injuries,” Dr. Wetzel says, “then they really need to be at a Level 1 trauma center” with both the general surgical and orthopaedic trauma teams coordinating their efforts for the best possible outcome for the patient.

A Better Trauma System

That cooperation and camaraderie among trauma surgeons goes well beyond their subspecialties or their hospitals. For as much as the rest of the world ranks hospitals, trauma teams and even individual surgeons, what matters most to doctors is being in the right place, at the right time and having the right resources available to care for patients. For Cleveland, now having a Level 1 trauma center on the Eastside with good access for patients is what matters most. “The relationship with MetroHealth Medical Center, where I trained and worked for decades,” says Dr. Sontich, “is continuing to develop. And working together, we’ll have a better trauma system for treating the people of Cleveland and Northeast Ohio.”

Get to Know the Orthopaedic Trauma Team

Three new traumatologists share similar pathway to the specialty

Orthopaedic traumatologists John Sontich, MD, Kevin Malone, MD, and Robert Wetzel, MD, share much more in common than their excellent capabilities as physicians. They each have a story of being mentored early on by an orthopaedist, a passion to master new skills and abilities and a view of their peers as collaborators, not competitors. That has given each of them a lifetime appreciation of their field.

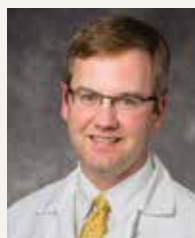
“There’s exceptional camaraderie in being orthopaedic trauma surgeons,” says Dr. Sontich, Chief of Orthopaedic Trauma and Post-Traumatic Reconstruction. A Dartmouth college football player, Dr. Sontich experienced orthopaedics first as a patient and went to medical school at the University of Cincinnati planning to specialize in sports and low-energy trauma injuries.

Once in medical school, though, Dr. Sontich found himself more interested in high-energy injuries – “the really bad ones,” he says – that require specialty training in limb salvage and stabilization. Then, during his residency at the Cleveland Clinic, Dr. Sontich was exposed to the Ilizarov technique for limb salvage, which spurred his interest in using the technique during his trauma fellowship at MetroHealth. In 1996, he went to Russia to learn the technique at the Ilizarov Institute itself, bringing the concepts home to the United States. For two decades at MetroHealth, Dr. Sontich used the technique for traumatic reconstruction on thousands of patients that otherwise may have required amputations, taught the technique to others, and has developed a modified version of the Ilizarov technique that incorporates computer assistance.

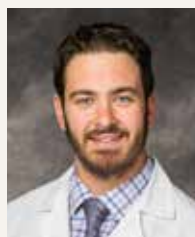
Part of the reason for the exceptional camaraderie among orthopaedic trauma surgeons is because of the team effort to treat trauma patients: each team member is focused on a particular aspect of care. “If the injury is to the arm,” says Dr. Malone, Chief of Hand Surgery, “I take care of it.” With eight years of experience at MetroHealth’s Level 1 trauma center, Dr. Malone has treated most every type of injury to the upper extremities. His fellowship training was in hand and microvascular surgery at the University of Washington’s Harborview Medical Center, after an orthopaedic surgery residency at Michigan’s William Beaumont Hospital. While Dr. Malone grew up talking about the medical practice at the dinner table with his father, a malpractice defense attorney,



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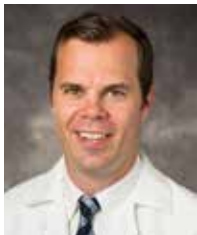


ROBERT WETZEL, MD
*Orthopaedic Traumatologist, UH Case Medical Center
Assistant Professor of Orthopaedics, Case Western Reserve University School of Medicine*

it was his four pre-med roommates that got him interested in medical school, which he attended at the University of Cincinnati. There, an old friend from high school a few years ahead of him invited Dr. Malone to do an orthopaedic rotation with him. “Once I got into the operating room and got to work on orthopaedic injuries, I was hooked,” he says.

A Cleveland native, Dr. Malone is delighted to be able to further advance his career here at home. “I like that I’m taking care of the town that I grew up in,” he says, “and being a lifelong Browns fan, that’s exciting for me, too!”

For Dr. Robert Wetzel, becoming an orthopaedic surgeon has been a lifelong pursuit. The son of an internist, Dr. Wetzel decided on a medical career early on, settling on orthopaedics by the time he was barely a teenager. “As many orthopaedists do,” says Dr. Wetzel, “I had a childhood injury that was referred to an orthopaedist, and he became a mentor to me.” Dr. Wetzel attended Northeast Ohio Medical University for his medical degree and completed his orthopaedic surgery residency at Northwestern University in Chicago. From there, Dr. Wetzel went on to a very busy fellowship in orthopaedic traumatology at Indiana University Methodist Hospital in Indianapolis. “I learned a lot there about how to take care of the sickest kind of people,” says Dr. Wetzel: “For the short time that trauma patients are under my care, I treat them as I have been treated, as if I had been caring for them for years.”



JAMES VOOS, MD

*Division Chief, Sports Medicine,
UH Case Medical Center
Jack and Mary Herrick Endowed
Director of Sports Medicine
Head Team Physician, Cleveland Browns
Associate Professor of Orthopaedics,
Case Western Reserve University
School of Medicine*

Wearable TECH

UH leveraging data from devices to reduce sports injury risk

From an orthopaedic surgeon's view, the goal of wearable technology is to improve people's health and longevity, whether they're just starting an exercise program, recovering from an injury or maximizing their performance. "We're looking for ways to help people both start and extend their athletic lives," says James Voos, MD, Chief of the Division of Sports Medicine, Jack and Mary Herrick Endowed Director of Sports Medicine and Head Team Physician for the Cleveland Browns.

Already, wearable technology enables real-time monitoring of physiologic and movement parameters, allowing researchers to calculate everything from workloads of particular joints and muscle groups to rates of biomechanical fatigue. Now, Dr. Voos and his colleagues have put all that information together in studying the practice sessions of the Cleveland Browns: "This is the first time that we've been able to calculate the work loads and physical demands that an athlete faces on a day-to-day basis," Dr. Voos says.

Having calculated such values, Dr. Voos's team is now studying the predictive power of the data to help reduce the risk of injury. "So if we see that a player had, say, a hamstring injury," Dr. Voos says, "we're looking for anything in the data that's outside of that player's normal values that could have predicted the injury." This information can be used in future monitoring of the athlete in efforts to reduce the risk of injury or aid an athlete recovering from injury in a safe return to play.

"Overuse injuries are the biggest problem for our high school athletes," says Dr. Voos, "so if we can utilize this technology to help prevent or reduce the risk of overuse injuries, we can allow more athletes to stay active and injury free."

While the wearable sensors used by professional teams can be expensive and complex, the cost of personal wearable technology devices and ease of use continue to improve, allowing for amateur teams and weekend warriors to benefit. "That's what I'm particularly excited about," says Dr. Voos, "and we're collaborating with device makers and software engineers to improve the technology in order to find increasing applications in sports medicine."

The Division of Sports Medicine at University Hospitals is uniquely positioned to forge such partnerships because of the existing relationships with athletes at every level. "We take care of a large number of youth and high school teams, as well as college and professional teams," says Dr. Voos, "all of which are interested in this research. So we're able to test these devices safely on a large number of athletes." In addition, Dr. Voos says the department is committed to further develop its expertise and research on wearable technology: "We have developed a comprehensive team that is poised to serve as the content experts to develop and analyze data from these devices," he says.

Very soon, whether on a weight-loss program, recovering from a hip fracture or just supplementing a healthy lifestyle with regular exercise, it's likely that people will be able to further benefit from the wearable technology that they already own. That's because coupling the forthcoming results from the Cleveland Browns study with data from consumer-level technology already on the market should improve the public's ability to start, monitor and improve their exercise programs safely. "The most frustrating thing that happens for a person motivated to exercise is getting hurt," says Dr. Voos. "If we can use these devices – from pedometers to heart-rate monitors – to help people exercise safely, that's a great outcome from this technology."

WHEN TO REFER FOR POST-TRAUMATIC ORTHOPAEDIC CARE

There are four major reasons to refer to a specialist for post-traumatic orthopaedic care: if the fixation hardware is failing, if bone healing is significantly delayed, if there's suspected bone infection, or if the bone has healed in malalignment.

"Certainly refer if a limb is shortened," says John Sontich, MD, one of the world's leading experts in limb-lengthening procedures. Dr. Sontich is Chief of the Division of Orthopaedic Trauma and Post-Traumatic Reconstruction at UH Case Medical Center. "Limb-length inequality is one of the major causes of back pain even if the patient isn't presenting with any limb pain," he says.

Malunions (bones that heal incorrectly) are often apparent, but even slight deformities can cause patients problems beyond any pain patients may experience. That's because bones that heal in unnatural positions will cause too much pressure on nearby joints, which will then wear out very quickly. "That can be a real problem, particularly in younger people," says Dr. Sontich, "so it's better to straighten the bone out."

For months or even years after a nonunion (bones that do not heal), patients may feel pain, which may be constant or felt only when using that part of the body. To diagnose, Dr. Sontich says, "It may require a CT scan or MRI because traditional X-rays may incorrectly suggest the bone has healed." Nonunions typically happen either because of inadequate blood supply, which usually comes back on its own during the healing process, or because of inadequate stability. Proper fixation is needed to get bones to grow back together in their correct, natural positions.

Diagnosing an infection after a fracture can be difficult because healing fractures may yield the same blood test results as an infection does. So it's often up to the knowledge and experience of the physician to determine whether a patient's pain, swelling and/or inflammation is more than normal. The orthopaedic specialists at UH have a deep level of expertise and take a collaborative approach because bone trauma means body trauma. That means that whether it's an emergency situation or a post-traumatic condition, your physician will be teamed up with specialists in multiple disciplines to diagnose what's wrong and determine the best possible course of action for treatment and rehabilitation.



JOHN SONTICH, MD

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University Hospitals Case Medical Center and Case Western Reserve University School of Medicine are consistently recognized as two of the premier institutions in the nation, according to U.S. News & World Report's annual rankings.

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