ORTHOPAEDIC SURGERY AND MUSCULOSKELETAL SCIENCE

FINDING ANSWERS IN PEDIATRIC ORTHOPAEDICS

2017 REPORT

Children's Mercy
KANSAS CITY

Children's Mercy
KANSAS CITY

To learn more about how we are transforming outcomes for orthopaedic care, visit or call

childrensmercy.org/orthopaedicsurgery

Orthopaedic Office: (816) 234-3075

ORTHOPAEDIC SURGERY

At Children's Mercy Kansas City, we are constantly advancing the care we provide our patients, always seeking to answer the questions that make a difference in their outcomes and lives.

As part of this effort, this past year the division has evolved to department status and is now called the Children's Mercy Department of Orthopaedics and Musculoskeletal Science. This change reflects the scope of services we provide, the responsibility we have to be accountable for all of our programs, and the commitment and support from Children's Mercy to pediatric orthopaedics.

Highlights of the year include the opening of the new 2,700 square foot Children's Mercy Sports Medicine Center at Village West, moving the gait lab to the Sports Center, and our growing faculty with the addition of Micah Sinclair, MD and Brian Harvey, DO. We now have much greater diversity in our department, with seven of our 17 physicians being female.

We continue to have an increasing number of students and residents participating in our growing research program. Fifteen medical students and seven orthopaedic residents participated in research projects in 2017. The department had a total of 19 projects approved by the Internal Review Board, 37 publications and 29 national presentations.

Our Scholar Research Program continues to develop, with summer 2017 medical students Elise Emanuelli and Andy Hiet from the University of Kansas Medical Center and Kumar Ashwarth from University of Missouri-Kansas City.

Elise Emannueli's project, "Adherence to AAOS AUC for Type 3 Supracondylar Fracture of the Humerus Among Pediatric Orthopaedic Surgeons at a Children's Hospital," will be presented at the POSNA annual meeting in Austin, Texas in May 2018.

We have a vibrant Department Research Subcommittee that reviews all research proposals with a seven-day turn-around time and is also involved in interviewing and selecting our Summer Scholars. We anticipate that during 2018, the research program will continue to mature and help mentor our next generation of young clinicians and investigators.

Sincerely,

Brad Olney, MD
Chairman, Department of Orthopaedics
and Musculoskeletal Sciences

Richard Schwend, MD
Director, Orthopaedic Research Program

BEST CHILDREN'S HOSPITALS
U.S.News & WORLD REPORT
ORTHOPEDICS
2017-18

17 pediatric orthopaedic faculty

25 nurse practitioners

2 physician assistants

100% dedicated team of physical therapists

2017 publications **37** published

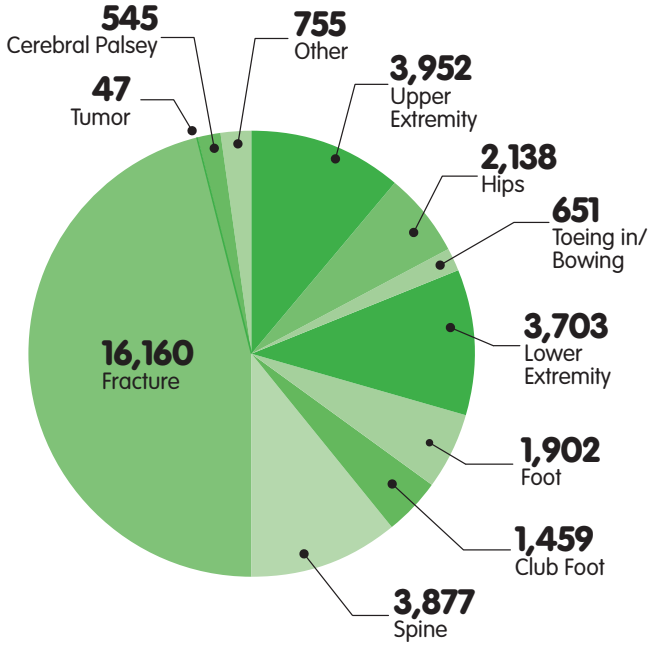
presentations given by invitation **29**

Professional association leadership positions **13**

over **35,000** orthopaedic clinic visits in 2017

Children's Mercy Kansas City orthopaedic surgeons and support staff members applied the Lean principle "Separate needed from unneeded items," drastically reducing the number of trays in the operating room from **22 to six** and lowering costs, with a total estimated **savings of $388,000 a year.**

2017 Orthopaedic Clinic Volume



Neuromuscular Kids Benefit from State-of-the-Art Technology

For patients with cerebral palsy or spina bifida, the department's orthopaedic surgeons use the high-resolution, 3-D motion analysis lab to improve their understanding of the pathomechanics of the patient's gait and movement. The team also uses it to record a patient's status before treatment, and to track their progress following surgery and rehabilitation.

"Gait and motion analysis assists us in objectively documenting the patient's gait issues, identifying underlying causes for any abnormalities and planning for treatment, including surgery, physical therapy and bracing," said Kathryn Keeler, MD, Assistant Professor of Pediatric Orthopaedic Surgery, University of Missouri-Kansas City School of Medicine.

"Based on research, and in my own experience, results of the gait and motion analysis may change our treatment plan in about 25 percent of cases and that's significant for our patients," Dr. Keeler said. "It helps us pinpoint our surgical strategy and can result in better outcomes for our patients and their families."


Jason Yoder, DPT

Sports Medicine Center at Village West is First-of-Its-Kind

When the Sports Medicine Center at Village West recently opened in Kansas City, Kan., it became the culmination of a first-of-its-kind collaboration between a sports medicine provider (Children's Mercy), a professional sports team (Sporting Kansas City) and a national sports federation (U.S. Soccer). Never before have professional athletes shared the same gym and rehabilitation space with student athletes.

"This is completely unprecedented and incredibly visionary for Children's Mercy and Sporting KC," said Kevin Latz, MD, Director, Sports Medicine Center at Children's Mercy Kansas City.

"The gym is a unique area that allows real interaction during physical therapy for say, a pitcher, dancer or linebacker to rehab after injury. Student athletes who come here may find themselves working out next to a professional athlete since we'll be sharing the gym with Sporting KC and U.S. Soccer."

The Center offers comprehensive sports medicine services for student athletes with sports-specific physical therapists, nutritionists, psychologists, nurse practitioners, doctors and surgeons.

The Sports Medicine Center at Village West is a first-of-its-kind collaboration between a sports medicine provider, a professional sports team and a national sports federation.

"Student athletes can get all of those specialized services under one roof," said Dr. Latz. Other services such as injury prevention, performance enhancement, and strengthening and conditioning will also be offered.

The new gym optimizes a student athlete's rehabilitation in a number of ways.

"We have much more advanced equipment and a tremendous amount of open space where we can work with groups of six or eight athletes, putting them through drills together as a team," Dr. Latz said. "More than ever before, we will be able to simulate the game environment prior to the athlete returning to the real field of play."

The new facility is 27,000 square feet with a 13,000 square feet gym and includes:

- Injury prevention programs for ACL, throwing athletes, running athletes, and teams.

Greg Canty, MD; Kevin Latz, MD: Matt Besler, Sporting Kansas City Captain; Donna Pacicca, MD

- A 2,000-square feet 3-D motion analysis and human performance lab with 20 cameras. Here, the sports medicine team can study gait and movement patterns, resulting in evidence-based return-to-play decisions.

- 400 pieces of equipment including a state-of-the-art Woodway Treadmill package and NASA-designed AlterG treadmill. This is the first facility in America to own the new Alter G Via400X with Stride Smart Gait Recording Technology.

- A Parvo Medics Metabolic Cart to complete VO2 testing to further assess and customize treatments for elite athletes.

- The HydroWorx 2000 underwater treadmill pool featuring a floor that adjusts from zero entry to 6 feet in depth. The entire surface is a treadmill, allowing for endless rehabilitation and training options.

- The Hydro 3500i rehab pool with a variety of depths, massage jets and an additional underwater treadmill.

- 5,000 square feet of open space to run, cut and complete sport-specific movements, including more than 3,500 square feet of turf and an NCAA regulation hardwood basketball half court.

- Six clinic rooms where patients have access to comprehensive sports medicine services including physicians, nurse practitioners, physical therapists, athletic trainers, nutritionists, mental health and radiology.

The Sports Medicine Center is housed in the same building as the new, expansive training home of Sporting Kansas City, and capable of hosting clubs and national teams from around the world, thanks to its stunning facilities and countless cutting-edge amenities.

"This facility elevates the soccer profile in Kansas City and nationally, giving teams of all ages everything they need to compete at the highest level—from the soccer fields and swimming pools to the massive gymnasium and the Human Performance Lab," said Jake Reid, President, Sporting Kansas City.

Dr. Latz also recognizes an opportunity with the U.S. Soccer relationship.

"It will be a win-win relationship for us with U.S. Soccer. They have their own medical personnel, and we have a huge opportunity to learn from them. On the flip side, we will be able to provide sports medicine education on nutrition, PT, injury prevention and more to their coaches and referees who will come here for training. This is a center that brings it all together for us."

For more information on this one-of-a-kind facility, visit childrensmercy.org/sportsmedicine.

Dr. Schwend performed more than 20 surgeries to save Colton's knees, which has greatly enhanced his mobility as he has grown.

How Can We Reduce or Eliminate Lawnmower Injuries in Children?

Nearly 10 years ago Colton Newman, a farm boy from rural Missouri, fell from a tractor that was pulling a Brush Hog mower. His right leg was severed just below the knee; his lower left leg was mangled so badly it couldn't be saved.

"Colton's injury was like the damage caused by a land mine," said Richard Schwend, MD, Director of Orthopaedic Research at Children's Mercy, and President of the Pediatric Orthopaedic Society of North America. "It looked like something you'd see in Afghanistan."

Dr. Schwend performed more than 20 surgeries to save Colton's knees, which has greatly enhanced his mobility as he has grown.

Today, Colton and the other children who have been treated at Children's Mercy for lawnmower injuries, serve as inspiration for a report from the Department of

Colton Newman

Children's Mercy is assessing the operator of the lawnmower and geographic location where the injury occurred as risk factors for lawnmower-related injuries.

Orthopaedics and Musculoskeletal Medicine examining the causes, patterns and effects of lawnmower injuries between 1995 and 2015.

According to Dr. Schwend, this may be the first study to assess the operator of the lawnmower and geographic location where the injury occurred as risk factors for lawnmower-related injuries.

Amanda Fletcher, MD, MS, now an Orthopaedic Surgery Resident Duke University Medical Center Department of Orthopaedic Surgery Dale Jarka, MD, Associate Professor of Orthopaedics, University of Missouri-Kansas City, and Dr. Schwend authored this report, which has been submitted for publication.

"As pediatric orthopaedic surgeons, we often see children injured by high-energy machinery," Dr. Schwend said. "As the only designated level 1 pediatric trauma center devoted exclusively to pediatric patients between St. Louis and Denver, we are in a unique position to investigate lawnmower injuries."

Highlights from this analysis include:

- 157 patients 0-18 years old presented to Children's Mercy from 1995 to 2015 after sustaining a lawnmower injury
- Peak ages for injury were 4 and 15 years
- 75 percent were male
- 66 percent were admitted to the hospital resulting in an average of three operating room visits per child
- 85 percent suffered lower extremity injuries
- 40 percent underwent at least one amputation, most commonly in the forefoot
- 13 percent required a prosthesis after injury
- 48 percent involved a riding lawnmower; 23 percent a push mower; 25 percent did not mention the type of mower
- 45 percent of injured children were bystanders; 27 percent were operating the mower; and 20 percent were passengers on the mower
- 90 percent of incidents occurred between April through September

- 19 percent lived in a non-metro/rural location

"The age and sex data from this analysis were most revealing," Dr. Schwend said. "Though you might expect teenagers operating a mower to suffer lawnmower injuries, we actually saw the highest number of injuries in 4-year-olds. These are young children who have no business being around this type of machinery, and whose injuries result in lifelong consequences, and sometimes even death."

The department's goal is to have a significant role in the development of a nationwide lawnmower injury registry, as well as public education and advocacy.

"Lawnmower injuries result in devastating trauma for the child and family," Dr. Schwend said. "Children's Mercy is in a unique position. Our experience can serve as the foundation for what could one day become a nationwide registry on lawnmower injuries," he added. "This type of information could help us better target our message of prevention to the right geographic areas and population groups."

Cerebral Palsy Warming Bundle Prevents Unintentional Hypothermic Events

Kathryn Keeler, MD, Assistant Professor of Pediatric Orthopaedic Surgery, University of Missouri-Kansas City School of Medicine, often operates on children with cerebral palsy and other neuromuscular disorders.

The CP warming bundle quality improvement trial was implemented to increase and maintain the temperature of CP patients and reduce risk of unintentional hypothermic events, infection and blood loss.

"It is well-documented that these patients have more difficulty thermoregulating than other children due to neurological damage," she said. "This can pose a problem in the operating room. Being cold puts these patients at increased risk for an unintentional hypothermic event, infection and blood loss."

"This is a team effort that is much more than a comfort measure. There is a physiological reason to keep these patients warm. We believe it will result in better patient outcomes."
Jessica Garden, RN, BS, CNOR

Unfortunately, warming them isn't as simple as putting another blanket on the child. Increasing the operating room temperature also can pose a risk to a safe and comfortable working environment for the surgical team, and may compromise the room's sterility.

Faced with this challenge, Dr. Keeler and Jessica Garden, RN, BS, CNOR, Orthopaedic Specialty Team, developed an innovative quality improvement perioperative CP warming bundle. The bundle is structured like a football game, with a pregame and four quarters, called Game Day Warm-up: Team-Based Hypothermia Prevention in Pediatric Cerebral Palsy Patients.

The CP warming bundle trial was conducted from September 2016 through June 2017. The trial included 26 total patients; 13 pre-bundle implementation and 13 post-bundle implementation patients.

Through the quality improvement project, Dr. Keeler and Garden have been tracking the patient's body temperature pre-, intra- and post-operatively, as well as the room temperature during the procedure. The goal was to increase and maintain the temperature of cerebral palsy patients from below 35.9°C to an average of 36.0°C and above.

- 3 of 13 pre-bundle and 11 of 13 post-bundle patients' temperature ≥ 36.0°C. (ODDS ratio 18, 95 percent CI 3-133, p=.0048 Fischer exact test).
- This represents a 62 percent increase in number of patients with a temperature ≥ 36.0°C (23 to 85 percent). Chi square test with a p = 0.0002).
- 1.5° C (95 percent CI 0.6-1.9° C, p=.0007 unpaired t test) increase in average intra-op temperature from 35.1°C to 36.6°C.

This multi-tiered approach to patient warming begins before the child ever leaves home. The team began using the protocol in November 2016 for patients who have been diagnosed with spastic quadriplegia or diplegia with a GMSCF of 3 to 5.

The Game Day Plan includes:

Pre-game Planning

- Educating families on the CP disease process and complications related to intraoperative hypothermia
- Instructing families to dress patient in appropriate clothing for ride to the hospital

Game Day!

1st quarter – Same Day Surgery

- Forced air warming gown on and running for 30 minutes

2nd quarter – Operating Room

- 2 forced air warming blankets (underbody and gown)
- IV fluid warmer
- Warm blankets if needed
- Changing OR room temp if needed

3rd quarter – Recovery Room

- Warm blankets
- Warming gown running if needed

4th quarter – Transfer to Inpatient Unit

- Warm blankets when needed

"We are the first at the hospital to trial this warming protocol for our cerebral palsy patients and may be one of the first in the country to use it specifically as part of a pediatric CP warming protocol," Garden said.

"This is a team effort that is much more than a comfort measure. There is a physiological reason to keep these patients warm. We believe it will result in better patient outcomes."

ROTC Tracks Pediatric Orthopaedic Extremity Trauma

The Registry of Orthopaedic Trauma in Children (ROTC) is the pediatric arm of the Major Extremity Trauma Research Consortium (METRC). METRC was established in September 2009 with funding from the Department of Defense (DOD) and the Orthopaedic Extremity Trauma Research Program to develop treatment guidelines for the optimal care of the wounded warrior.

According to Mark Sinclair, MD, Assistant Professor of Pediatric Orthopaedic Surgery, University of Missouri-Kansas City School of Medicine, and site coordinator at Children's Mercy Kansas City, ROTC collects data on children who have suffered an extremity fracture requiring surgery or hospital admission.

"METRC has been a great resource, providing wounded soldiers with the best patient care practices and tracking their progress," Dr. Sinclair said. "The creators of the consortium thought children also could benefit from a similar collaborative effort."

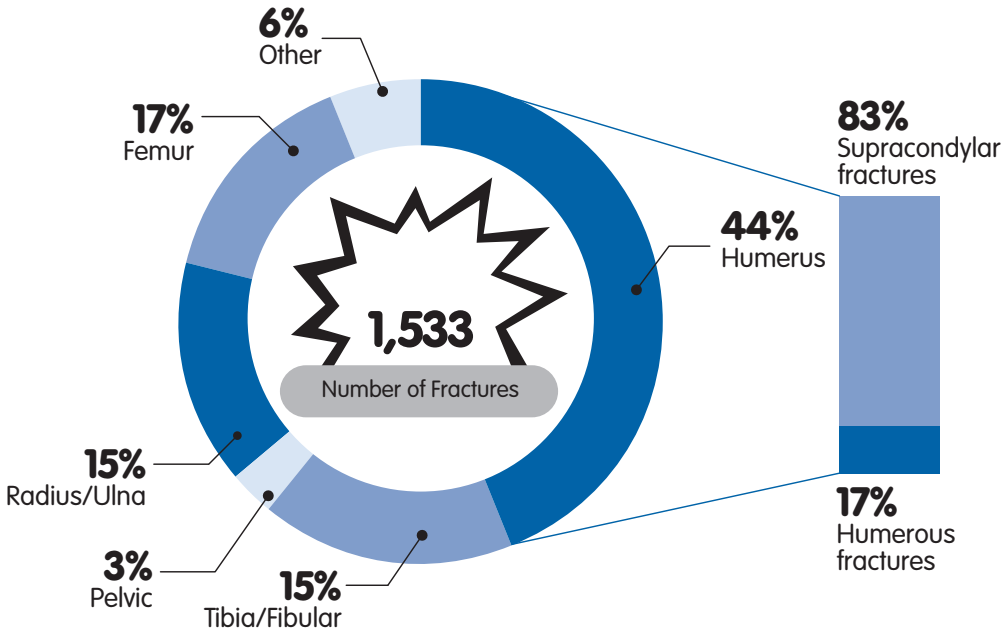
Children's Mercy is one of six level 1 pediatric centers across the nation participating in the Registry of Orthopaedic Trauma in Children to develop guidelines for optimal care of children who have suffered an extremity fracture requiring surgery or hospital admission.

Currently, six level I pediatric trauma centers across the nation are participating in the consortium, including Children's Mercy. Other sites include: Carolinas Medical Center/Levine Children's Hospital, Charlotte, N.C.; Helen DeVos Children's Hospital, Grand Rapids, Mich.; Vanderbilt University Medical Center, Nashville, Tenn.; UCLA Medical Center, Los Angeles, Calif.; and Children's Hospital and Medical Center Omaha/University of Nebraska, Omaha, Neb.

"We were asked to take part because we have a very busy level I trauma service at Children's Mercy representing a diverse patient population, including urban, suburban and rural referrals," Dr. Sinclair said.

In fact, of the 5,300 patients enrolled in the registry since November 2015, approximately 29 percent are Children's Mercy patients.

Fractures Meeting Inclusion Criteria for ROTC 2017



"This makes Children's Mercy the busiest center enrolling in ROTC," Dr. Sinclair said. "These are only patients who have sustained injuries from the wrist to the shoulder or pelvis to the ankle, and who have required hospitalization or surgery to treat the injury."

Already, Dr. Sinclair said this database is providing valuable information regarding pediatric orthopaedic injury trends and best practices.

Currently, the consortium is looking at the optimal age-related treatment of pediatric and adolescent femur and forearm fractures. They are also looking at problematic subsets of common injuries, such as supracondylar humerus fractures and growth plate injuries. They collect important demographic information as well, looking at common patterns and ways to prevent injury.

"The collective power of this consortium is that it gives us the information to define best practices for children who experience common injuries," he added. "But by pooling our patient data, we also can reach the critical mass necessary to analyze rare or problematic subsets of pediatric orthopaedic injuries, something none of us would be able to accomplish alone."

Pediatrics Orthopaedics Registries

METRC - Major Extremity Trauma Research Consortium: This registry includes patients admitted to Level 1 Trauma Centers with fractures requiring surgery of the upper or lower extremity, pelvis or acetabulum, and foot.

GSSG - Growing Spine Study Group: Repository is comprised of several sites that collect data that will be used to study early onset scoliosis. The purpose of this database is to provide researchers with a global exchange of data for consortium members that will be used for future research for projects involving the study of early onset scoliosis. Schwend R, Price N, Anderson J.

CSSG - Children's Spine Study Group: The Children's Spine Registry (CS Registry) is operated by Children's


John Anderson, MD, FAAP


Kathryn A. Keeler, MD

Spine Foundation (CSF) and collects patient data on children with spine and chest wall deformities. Any type of spine and chest wall deformity as determined by the investigator may be entered. Price N, Schwend R, Anderson J.

ROCK - Research on OsteoChondritis of the Knee: The purpose of the registry is to follow the cohort open over a 50-year period, during which the study ID link will be maintained for the purpose of truly assessing the long-term effects of OCD on future outcomes, with periodic research studies based on the data collected for the cohort along the way. Latz K, Pacicca D, Vanderpool A, McQueen B.

Mentoring the Next Generation of Female Pediatric Orthopaedic Surgeons

According to the American Academy of Orthopaedic Surgeons (AAOS), only 5 percent of its 28,000-plus members are female—an even smaller number specialize in pediatric orthopaedic surgery.

But at Children's Mercy Kansas City, seven of the 17 pediatric orthopaedic surgery faculty members are women. They have expertise in everything from hand surgery to sports medicine to neuromuscular disease.

For Donna Pacicca, MD, Associate Professor of Orthopaedic Surgery, University of Missouri-Kansas City School of Medicine, mentoring female orthopaedic surgeons is vital to the development of the profession.

"It's tremendously important as a female orthopaedic surgeon to serve in a mentoring role for other women who might be considering orthopaedic surgery as a career," Dr. Pacicca said. "There are still many misconceptions about women in orthopaedics, so it's valuable for students to see women actually

in this role—operating, seeing patients and doing research—but also balancing work with family life."

Dr. Pacicca has mentored Molly Khoury, a third-year medical student with the University of Kansas Medical Center who also served as a summer scholar at Children's Mercy.

Dr. Pacicca and Khoury have collaborated on two research projects focused on looking at knee anatomy in pediatric patients using MRI to examine changes in growth and development, and how these changes relate to the surgeries available to patients. This research was a poster presentation at the prestigious 2017 Orthopaedic Research Society meeting and was presented from the podium at the 2017 Arthroscopy Association of North America meeting.

"I believe in giving back to the community at large and I enjoy mentoring students like Molly because when you are teaching, you have to know your material inside and out," Dr. Pacicca said.

"Medicine is constantly changing. Mentoring helps you stay sharp and current. Mentoring other women paves the way for the next generation of female orthopaedic surgeons."

Other female members of the Department of Orthopaedics and Musculoskeletal Medicine at Children's Mercy include:

- Christine J. Cheng, MD, MPH, Chief, Section of Hand Surgery; Pediatric Hand Surgeon; Clinical Assistant Professor of Pediatric Orthopaedic Surgery, University of Missouri-Kansas City School of Medicine
- Lisa M. Berglund, MD, Pediatric Orthopaedic Surgeon; Assistant Professor of Orthopaedic Surgery, University of Missouri-Kansas City School of Medicine
- Margaret E. Gibson, MD, Assistant Professor of Pediatrics, University of Missouri-Kansas City School of Medicine; Primary Care Sports Medicine Fellowship Director and Head Team Physician, University of Missouri-Kansas City School of Medicine

"There are still many misconceptions about women in orthopaedics, so it's valuable for students to see women actually in this role—operating, seeing patients and doing research—but also balancing work with family life."

Dale Jarka, MD, and Molly Khoury

- Dale E. Jarka, MD, Assistant Professor of Pediatric Orthopaedic Surgery, University of Missouri-Kansas City School of Medicine

- Kathryn A. Keeler, MD, Assistant Professor of Pediatric Orthopaedic Surgery, University of Missouri-Kansas City School of Medicine

- Natalie C. Stork, MD, Assistant Professor of Pediatric Orthopaedic Surgery, University of Missouri-Kansas City School of Medicine

After recognizing the corelation between injured student-athletes and feelings of isolation and depression, Children's Mercy Sports Medicine and Adolescent Psychiatry teamed up to develop a suicide screening protocol specific to sports medicine.

Sports Medicine Center Implements Suicide Screening

Research from the National Collegiate Athletic Association (NCAA) has shown that suicide represents the fourth leading cause of death among student athletes. Those who have suffered a sports injury may be at an even greater risk.

"Sports are such a big part of these student-athletes' lives that they can become isolated and depressed when they are removed from their peers while recovering from an injury," said Greg Canty, MD, Medical Director, Sports Medicine Center and Assistant Professor of Pediatric Orthopaedic Surgery, University of Missouri-Kansas City School of Medicine.

Recognizing this growing trend and aware of efforts to identify children at risk for suicide in other Children's Mercy clinics, Kevin Latz, MD, Chief, Section of Sports Medicine and Assistant Professor of Pediatric Orthopaedic Surgery, University of Missouri-Kansas City School of Medicine, approached Shayla Sullivant, MD, Child and Adolescent Psychiatrist and Assistant Professor of Pediatrics, University of Missouri-Kansas City, about implementing a suicide screening program for sports medicine patients. Dr. Sullivant's expertise is in suicide prevention.

Immediately, Dr. Sullivant and her team began working with the Center for Sports Medicine team, implementing screening at the program's Kansas location in 2015. When patients age 12 and older visit one of these clinics, they are

greeted by an athletic trainer or nurse who takes them to a private room where they ask them four yes-no questions using the Ask Suicide Screening Questions (ASQ) tool. The survey can be completed in about one minute by a trained staff member. Questions include:

1. In the past few weeks, have you wished you were dead?
2. In the past few weeks, have you felt that you or your family would be better off if you were dead?
3. In the past week, have you been having thoughts about killing yourself?
4. Have you ever tried to kill yourself? If yes, how?

"Parents are not present for the initial screening questions," Dr. Sullivant explained. "In order for this to work, the students have to answer honestly, and they are less likely to do so with a parent in the room. The sports medicine staff understands this and has implemented the ASQ as part of their workflow."

If the staff identifies a patient as at-risk, they connect them to a social worker the same day who completes a more thorough evaluation. The child's parents also are informed of the screening results. If needed, the social worker provides recommendations for next steps and makes referrals.

Since beginning the suicide screening in Sports Medicine, approximately 2.7 percent of the clinics' patients have demonstrated an elevated risk for suicide based on their responses. The project has now expanded to all of the sports medicine clinics throughout Children's Mercy.

Since beginning the suicide screening in 2015, the team has identified 2.7 percent of patients with an elevated risk for suicide. Once identified these patients get a same-day appointment with a social worker to complete a more in-depth evaluation and help to ensure proper treatment.

In addition, the Children's Mercy Sports Medicine Center is completing a National Institute for Mental Health study to validate the ASQ screening tool, along with Boston Children's Hospital. Dr. Sullivant serves as the principal investigator for this study at Children's Mercy, which is designed to be certain the tool accurately identifies patients at risk for suicide.

"The Children's Mercy sports medicine team understands the powerful mind-body connection of their patients, and that we must address both their mental and physical health for a full recovery,"


Shayla Sullivant, MD

"The fact that we are screening our sports medicine patients for suicide is unique," Dr. Canty said. "It demonstrates a more holistic approach to sports medicine, but most important, it's the right thing to do for our student athletes."

Dr. Sullivant said. "They have quickly adopted this screening measure in an effort to identify youth at risk and improve outcomes for their patients."

"The fact that we are screening our sports medicine patients for suicide is unique," Dr. Canty said. "It demonstrates a more holistic approach to sports medicine, but most important, it's the right thing to do for our student athletes."

Children's Mercy Leadership Influences Nationwide Initiatives

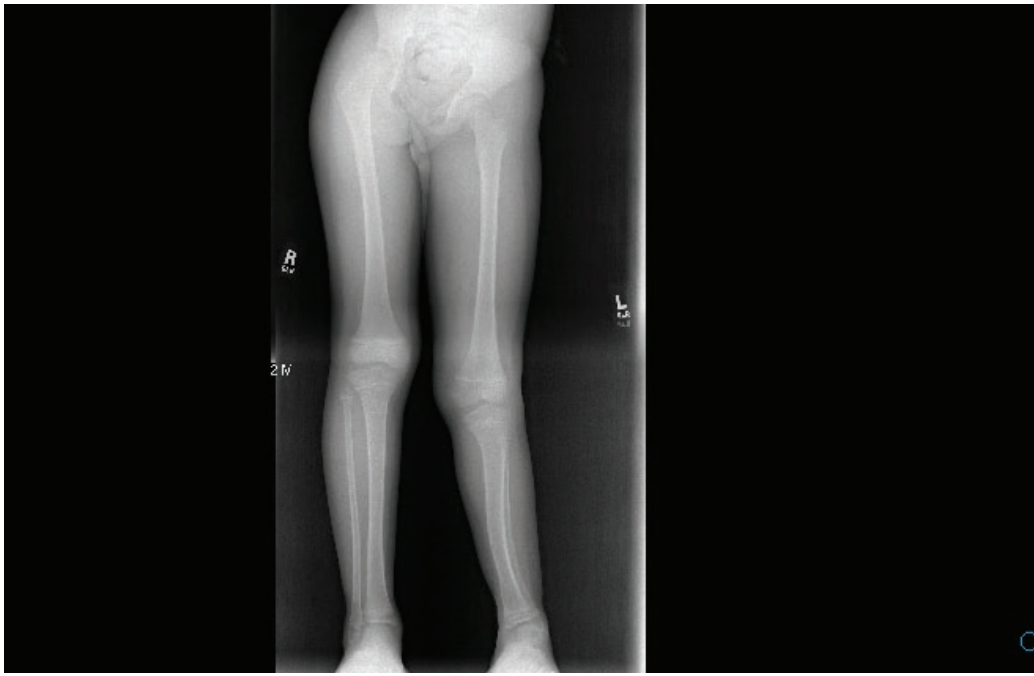
Thanks to his leadership on a nationwide level as president of the Pediatric Orthopaedic Society of North America, and past chair of the Orthopaedic Section of the American Academy of Pediatrics, Richard Schwend, MD, Director of Orthopaedic Research at Children's Mercy, has been involved in the development of three different initiatives important to the advancement of pediatric orthopaedics in 2017.

Opioid Use in Pediatric Orthopaedics—Dr. Schwend is an author on the recently accepted publication, "Current State of the Opioid Epidemic in Pediatric Orthopaedics." This publication from the Advocacy Committees of POSNA and the American Academy of Pediatrics Section on Orthopaedics will appear in the Journal of Pediatric Orthopaedics.

"This is our first attempt at gathering and publishing information on this important topic, which is at a crisis level across the nation," Dr. Schwend said. For example, when surveying lifetime experiences of high school seniors, 17.6 percent reported having had medical (legitimate) use of prescription opioids, and 12.9 percent reported non-medical use of prescription opioids. Of those, 80 percent initially had a legitimate prescription for opioids, but recreationally used the leftover medications from their prescription.

"We really want to address the best types of pain medications to use for pediatric patients, how much they need to effectively control their pain, and the dose necessary to manage their pain once they are discharged to home," he said.

As president of POSNA and past chair of the Orthopaedic Section of AAP, Richard Schwend, MD, has been involved in initiatives addressing opioid abuse, hip dysplasia, and guidelines for ordering tests and procedures.



In fact, POSNA will host a special symposium on the topic at its annual meeting in Austin, Texas, May 2018. Following that, Dr. Schwend anticipates a committee of experts will develop practice guidelines that will be implemented at pediatric hospitals across the country, including Children's Mercy.

Hip Dysplasia Screening Guidelines—The AAP declared a new clinical report on the evaluation and referral for developmental dysplasia of the hip in infants as one of the top 10 news stories in 2017. The report included important recommended changes in DDH surveillance for the pediatrician related to risk factors that may prompt an imaging study. It also encourages hip-healthy methods of swaddling.

Dr. Schwend served as chair of the AAP's Section on Orthopaedics at the time the group began developing the screening guidelines, which cover incidence, risk factors, screening and diagnosis, physical exam, radiography, ultrasonography, referral and treatment of DDH.

In addition, POSNA is taking the next step in diagnosing and treating DDH by creating a care map or pathway that general pediatricians can follow with these patients.

"The whole idea is to prevent an otherwise healthy child from having a dislocated hip by 6 to 12 months of age, and to utilize recognized best practices," he said.

Choosing Wisely List for Pediatric Orthopaedics—The Pediatric Orthopaedic Society of North America Evidence-Based Medicine Committee and the Advocacy Committee collaborated between 2014 and 2017 to develop a list of

five items in the practice of pediatric orthopaedics of tests or procedures that should not be done routinely.

At the time this process began, Dr. Schwend was serving as chair of the Advocacy Committee and was one of the approximately 20 members of these two committees participating in the process. Each surgeon, in a blinded fashion, submitted five tests or procedures from their practices and experience that they found were commonly over-utilized.

The items were tallied in order of number of times that item was listed by each surgeon. A total of 30 items were submitted. Both committees then agreed on a final list of items based on the frequency of responses and importance of the condition.

The final recommendations as a result of this process include:

- Do not order a screening hip ultrasound to rule out developmental hip dysplasia or congenital hip dislocation if the baby has no risk factors and has a clinically stable hip examination.
- Do not order radiographs or advise bracing or surgery for a child less than 8 years of age with simple in-toeing gait.
- Do not order custom orthotics or shoe inserts for a child with minimally symptomatic or asymptomatic flat feet.
- Do not order advanced imaging studies (MRI or CT) for most musculoskeletal conditions in a child until all appropriate clinical, laboratory and plain radiographic examinations have been completed.

From American Academy of Pediatrics – Section on Orthopaedics and the Pediatric Orthopaedic Society of North America

Five Things Physicians and Patients Should Question

1. Do not order a screening hip ultrasound to rule out developmental hip dysplasia or developmental hip dislocation if the baby has no risk factors and has a clinically stable hip examination.
2. Do not order radiographs or advise bracing or surgery for a child less than 8 years of age with simple in-toeing gait.
3. Do not order custom orthotics or shoe inserts for a child with minimally symptomatic or asymptomatic flat feet.
4. Do not order advanced imaging studies (MRI or CT) for most musculoskeletal conditions in a child until all appropriate clinical, laboratory and plain radiographic examinations have been completed.
5. Do not order follow-up X-rays for buckle (or torus) fractures if they are no longer tender or painful.

choosingwisely.org

"The whole idea is to prevent an otherwise healthy child from having a dislocated hip by 6 to 12 months of age, and to utilize recognized best practices."
Richard Schwend, MD

- Do not order follow-up X-rays for buckle (or torus) fractures if they are no longer tender or painful.

"Children's Mercy has supported all of these initiatives by supporting my leadership positions in these organizations," Dr. Schwend said. "They are designed to ensure that all children receive the standard of pediatric orthopaedic care at every hospital in the United States."

Publications

A Peripherally Inserted Central Catheter Line, Inserted the Day before Surgery, Decreases the Time from Induction to Incision for Spinal Deformity Surgery and Safely Provides Central Venous Access During Surgery: A Pilot Study. Stuedemann AE, Schwend RM, Thomas VK, Leamon JM, Lightner TS. J Pediatr Orthop B. 2017 Feb 24. doi: 10.1097/BPB.0000000000000445. [Epub ahead of print] PubMed PMID: 28240718.

Stuedemann A and Thomas V. Spine. In C. Cartwright, D. Wallace, Nursing Care of the Neurosurgical Patient (3rd ed.). Springer. April, 2017. ISBN 978-3-319-49319-0.

Off-Label Use of Medical Devices in Children. Section on Cardiology and Cardiac Surgery; Section on Orthopaedics. Pediatrics. 2017 Jan;139(1). pii: e20163439. doi: 10.1542/peds.2016-3439. PMID: 28025239.

Variation Among Pediatric Orthopaedic Surgeons When Treating Medial Epicondyle Fractures. Hughes M, Dua K, O'Hara NN, Brighton BK, Ganley TJ, Hennrikus WL, Herman MJ, Hyman JE, Lawrence JT, Mehlman CT, Noonan KJ, Otsuka NY, Schwend RM, Shrader MW, Smith BG, Sponseller PD, Abzug JM. J Pediatr Orthop. 2017 Oct 18. doi: 10.1097/BPO.0000000000001092. [Epub ahead of print] PMID 29049267.

Early Detection of Idiopathic Scoliosis in Adolescents. Hresko MT, Talwalkar V, Schwend R; AAOS, SRS, and POSNA. J Bone Joint Surg Am. 2016 Aug 17;98(16):e67. doi: 10.2106/JBJS.16.00224. Review. No abstract available. PMID:27535448.

The POSNA-COUR International Scholar Program. Results of the First 7 Years. Fornari ED, Sabharwal S, Schwend RM. J Pediatr Orthop. 2017 Dec;37(8):570-574. doi: 10.1097/BPO.0000000000000721. PMID: 26756989.

Current Issues Affecting the Practice of Pediatric Orthopaedic Surgeons: Results of the 2014 Workforce Survey of American Academy of Pediatrics Section on Orthopaedics. Hosseinzadeh P, Copley L, Ruch-Ross H, Schwend RM, Sawyer JR. J Pediatr Orthop. 2018 Jan;38(1):e14-e19. doi: 10.1097/BPO.0000000000000844. PMID: 27662381.

Early Detection of Scoliosis-What the USPSTF "I" Means for Us. Hresko MT, Schwend RM, Hostin R. Editorial. JAMA Pediatr Jan 9, 2018.

Current State of the Opioid Epidemic. A Report from the Advocacy Committee POSNA and the Section on Orthopaedics AAP. Raney E, VanBosse H, Schwend RM. Accepted for publication JPO 2018. JPO-1417R1.

Intra-operative Lateral Rib-pelvis Distraction for Treating Severe Neuromuscular Scoliosis. Singh L, Schwend RM. Submitted to Spine Deformity, June 2017. Published online doi:10.1001/jamapediatrics.2017.5585.

Experience with a Care Process Model in the Evaluation of Pediatric Musculoskeletal Infections in a Pediatric Emergency Department. Patel L, Michael J, Allen N, Schroeder L, Berglund L, Newland JG. Pediatr Emerg Care. Epub ahead of print. 2017 Mar 21.

Biomechanical Evaluation of a Growth Friendly Rod Construct. Galvis SN, Arnold J, Mannen EM, Wong BM, Sis HL, Cadel ES, Anderson JT, Anderson DE, Arnold PM, Friis EA. Spine Deformity 2017; 5: 11-17.

Does the Superior Articular Process of the Thoracic Vertebra Serve as a Useful Landmark for Determining the Angulation of Pedicle Screw Insertion in the Transverse Plane in Patients with Adolescent Idiopathic Scoliosis? Stevanovic O, Hermanson A, Anderson JT. Spine Deformity 2017; 5:52-55.

Influence of Sequential Ponte' Osteotomies on the Human Thoracic Spine with a Rib Cage. Mannen EM, Arnold PM, Anderson JT, Friis EA. Spine Deformity 2017; 5: 91-96.

Curve Flexibility in Cerebral Palsy Related Neuromuscular Scoliosis: Does the Intraoperative Prone Radiograph Reveal More Flexibility than Preoperative Radiographs? Chaudry Z, Anderson JT. Scoliosis and Spinal Disorders 2017; 12:15.

Should School Boards Discontinue Support for High School Football? Marogolis LH, Canty G, Halsted M, Lantos JD. Pediatrics Jan 2017, 139(1) e20162604; DOI: 10.1542/peds.2016-2604.

Infectious Diseases Associated with Organized Sports and Outbreak Control. Davies HD, Jackson MA, Rice SG; Committee on Infectious Diseases Oct 2017 Diseases; Council on Sports Medicine and Fitness (Collaborator, Canty GS). Pediatrics. Oct 2017 140(4). e20172477. doi: 10.1542/peds.2017-2477.

Back Pain in a High School Soccer Player. Nilan LM, Canty G. May 2017 Medicine & Science in Sports & Exercise. Vol 49(5S): 205, May 2017.

The Relationship of Anterior Cruciate Ligament Insertion Sites to the Distal Femoral Growth Centers: An MRI Study. Khoury M, Robinson AL, Staggs V, Dunoski B, Pacicca D. J of Arthroscopic & Related Surgery, 33(6):e6. June 2017.

Books and Chapters

Chapter 6. Pathologic Fractures and Nonaccidental Injuries. Schwend RM, Arkaer A. In Rockwood and Wilkins, ed. Fractures in Children. Seventh Edition. Philadelphia: Wolters Kluwer/Lippincott Williams & Wilkins; 2018.

Chapter 18. Pediatric Orthopaedic Trauma. Martus JE, Mencio GA, Schwend RM. In Holcomb GE Ashcraft's Pediatric Surgery. 7th edition. Elsevier.

Hip and Spine Injuries. Canty G. 2017 Sports Medicine in the Pediatric Office, 2nd ed.; American Academy of Pediatrics. Metzl JD, editor.

Guidance on Lawn Mower Safety Fails to Reduce Injuries. Jarka, DE & Adamczyk, M: AAP News, Aug. 11.

Complications of Distal Phalanx Fractures in Children. Lankachandra M, Wells CR, Cheng CJ, Hutchison RL. J Hand Surg [Am] 2017; 42 (7): 574.e1-574.e6.

Spine. Thomas V, Stuedemann A. In C. Cartwright, & D. Wallace, Nursing Care of the Neurosurgical Patient (2nd ed.). Heidelberg Germany: Springer.

Predictors of Postoperative Pain Trajectories in Adolescent Idiopathic Scoliosis. Connelly M, Fulmer RD, Prohaska J, Anson L, Dryer L, Thomas V, Ariagno JE, Price N, Schwend R. Spine [in press].

Presentations

Podium Presenter. Stuedemann A. American Academy of Orthopaedic Surgeons (AAOS) 2017 Annual Meeting; Nursing & Allied Health Program: Pediatric Pelvic Trauma, March 2017.
ePoster Presenter. Stuedemann A. Pediatric Nursing Certification Board FREE CE @ PNCB program: The Limping Child: Pitfalls and Pearls for the Pediatric Care Provider, March 2017.

Podium Presenter. Stuedemann A. Pediatric Orthopaedic Practitioners Society (POPS) Conference: Morbidity and Mortality Case Presentation, May 2017.

Draining the Swamp: The Role of Irrigation, Drains and Dressings. Schwend RM. Second Annual Summit in Safety in Spine Surgery, New York, Feb. 10, 2017.

Intra-operative Lateral Rib-pelvis Distraction for Treating Severe Neuromuscular Scoliosis. Singh L, Schwend RM. AAOS Annual Meeting. San Diego, Calif., March 2017.

Variation Among Pediatric Orthopaedic Surgeons When Treating Medial Epicondyle Fractures. Hughes M, Dua K, O'Hara NN, Brighton BK, Ganley TJ, Hennrikus WL, Herman MJ, Hyman JE, Lawrence JT, Mehlman CT, Noonan KJ, Otsuka NY, Schwend RM, Shrader MW, Smith BG, Sponseller PD, Abzug JM. (Presenter) 2017 European Pediatric Orthopaedic Society/Pediatric Orthopaedic Society of North America Combined Annual Meeting, Barcelona, Spain, May 2017.

Pain Patterns in SCFE. Schwend RM, Udovich M. 2017 European Pediatric Orthopaedic Society/Pediatric Orthopaedic Society of North America Combined Annual Meeting, Barcelona, Spain, May 2017.

The Ecuador Pediatric Spine Deformity Surgery Program: Development and Outcomes. An SRS-GOP Site, 2008-2014. Schwend RM, Fletcher A. Scoliosis Research Society, 52 Annual Meeting. Podium Presentation. Philadelphia, Pa., Sept. 6-9, 2017.

Como evaluo la columna en un nino. Schwend RM. 43rd Congrsso Ecuatoriano de ortopedia traumatologya. Cuenca, Ecuador, Oct. 8, 2017.

Chest and Spine Growth. What Have We Learned from Bones? Schwend RM. 11th International Congress on Early Onset Scoliosis (ICEOS), San Diego, Calif., Nov 16-17, 2017.

IPOS Concurrent Session 6. Office Non-Operative. Scoliosis-Monitoring Progression with Minimum Radiation. Schwend RM. 14th Annual POSNA AAOS IPOS, Orlando, Fla., Nov. 28-Dec. 2, 2017.

POPS: The Limping Child, Diagnostic Testing (Besides radiographic imaging studies). Schwend RM. 14th Annual POSNA AAOS IPOS, Orlando, Fla., Nov. 28-Dec. 2, 2017.

Alternative Techniques for 3-Dimensional Correction in the Presence of Atypical Anatomy. Medtronic Sponsored Case Discussion. Schwend RM, Ying L. 14th Annual POSNA AAOS IPOS, Orlando, Fla., Friday, Dec. 1, 2017.

Invited visiting professor EPOS POSNA HRDC Course. Richard M. Schwend. Nepal. March 1-3, 2017. Lectures:

- General Principles of Fractures and Trauma Care
- Principles of Spine Management
- Septic Hip Arthritis
- What You Need to Know about Perthes, SCFE, Coxa Vara and Others

Nigel Price, MD

POSNA COUR- IHDI- SEOT- Curso Ortopedia Infantil. Focus on DDH in the Infant and Adolescent. Schwend RM. Cuenca, Ecuador. Oct. 6, 2017.

Invited as POSNA President to 5th Annual SLAOTI meeting, Sao Paulo, Brazil, Oct. 12-14, 2017. Schwend RM. Lectures:

- Anterior Medial and Posterior Medial Deformity of the Tibia
- Congenital Pseudarthrosis of the Tibia
- Femoral Shaft Fracture Under 10 Years of Age
- My Tips on Ponseti Technique
- Lower Extremity Cases
- Supracondylar Humerus Fractures- Urgency and Open Reduction

Invited as POSNA President to DKOU2017 German Speaking Orthopaedic Association Annual meeting. Schwend, RM. Berlin, Germany, Oct. 24-27, 2017. Lectures:

- Early Diagnosis of DDH: The AAP and POSNA Approach
- Pes Cavus. What to Do When You See It?
- Differential Rod Contouring for 3D Correction of AIS.

Intra-operative Asymmetric Rib-pelvis Distraction in the Surgical Management of Severe Neuromuscular Scoliosis in Children. Schwend RM, Anderson JT, Price N, Singh L, Leamon J. Podium presentation at the American Academy of Orthopaedic Surgeons 2017 meeting, San Diego, Calif.

Pediatric Interventional Pain Management Techniques: An Educational Exhibit. Reading B, Cully B, Rivard D, Theut S, Anderson JT. E-poster. Society or Pediatric Radiology. May 16-20, 2017. Vancouver, Canada.

Invited Faculty: Pediatric Back Pain, Office Based Pediatric Orthopaedics, Pediatric Musculoskeletal Infection and the Limping Child. Anderson JT. American Academy of Pediatrics Practical Pediatrics Continuing Medical Education Course. Sept. 1-3 2017, Philadelphia, Pa.

Athletes, Not Addicts: Managing Pain During the Opioid Crisis. Canty G. Oct. 11, 2017 National Webinar (Invited). Drug Free Sport Webinar Series Kansas City, Mo.

Sever's Apophysitis or Something More Sinister? Canty G. May 12, 2017 Poster, Nilan LM, Canty GS. American Medical Society for Sports Medicine 26th Annual Meeting. San Diego, Calif.

Ouch, That's Gotta Hurt! Pediatric Fractures & Injuries. Canty G. (Invited), Oct. 5, 2017 Kansas City Southwest Clinical Society 95th Annual Fall Conference Overland Park, Kan.

The 2 Minute Drill: Head to Toe Musculoskeletal Exam. Canty G. (Invited), Sept. 27, 2017 Workshop, 50th Annual Clinical Advances in Pediatrics Symposium Children's Mercy Park, Kansas City, Kan.

Sports-related Concussion Still Giving You a Headache? Canty G. (Invited) April 19, 2017 Grand Rounds, Olathe Health System Olathe, Kan.

Relationship of Anterior Cruciate Ligament Insertion Sites to the Distal Femoral Growth Centers: An MRI Study. Khoury M, Robinson AL, Staggs V, Dunoski B, Pacicca D. The AANA Annual Meeting, Denver, Colo., May 18-20, 2017

The Relationship of the Posterior Cruciate Ligament Insertion Site to the Proximal Tibial Growth Centers: An MRI Study. Khoury M, Robinson AL, Staggs V, Dunoski B, Pacicca D. Orthopaedic Research Society Annual Meeting, San Diego, Calif., March 19-22, 2017.

Developmental Dysplasia of the Hip. Olny B. Freeman Health Center Grand Rounds. Joplin, Mo., Feb. 1, 2017.

Treatment of Limb Length Discrepancy. Olny B. CMH Grand Rounds. Kansas City, Mo., Feb. 15, 2017.

Professional Associations/ Awards

Anne Stuedemann, RN, MSN, CPNP

- Advanced Practice Advisory Council: Children's Mercy Kansas City, 2016-2019
- Conference Chair 2017: Pediatric Orthopedic Practitioners Society (POPS), 12th Annual Conference, Barcelona, Spain
- Board Member, President 2016-2017: Pediatric Orthopedic Practitioners Society (POPS)

Richard M. Schwend, MD, FAAP, FAOA

- May 2017-May 2018, President POSNA
- May 2017-May 2018, Chair POSNA Awards Committee
- September 2017-September 2018, Chair SRS Health Policy Committee
- Medical Advisory Board Member, Miracle Feet, 2012-present
- Board Member and Physician Advisor, Project Perfect World 2008-present
- Chaired: AAP Primary Care Pediatrics, Copper Mountain, February 2017

Greg Canty, MD, FAAP

- Executive Committee Member (elected) July 2016 – present, Council on Sports Medicine & Fitness American Academy of Pediatrics
- Golden Apple Mercy Mentor June 2017 Award given to faculty members who have provided significant contributions to the growth and development of a fellow during their training

Donna M. Pacicca, MD

- Chairman, Awards Committee, PRISM Annual Meeting, 2015-2017
- Treasurer and Board Member, PRISM, 2016-2018

Orthopaedic Surgery and Musculoskeletal Science Faculty

Department Chairman

Bradford W. Olney, MD
Chairman, Department of Orthopaedic Surgery and Musculoskeletal Science; The Dr. Rex and Lillian Diveley Endowed Chair in Pediatric Orthopaedic Surgery; Professor of Pediatric Orthopaedic Surgery, University of Missouri-Kansas City School of Medicine

Faculty

John T. Anderson, MD, FAAP
Associate Professor of Orthopaedic Surgery, University of Missouri-Kansas City School of Medicine; Clinical Assistant Professor of Orthopaedic Surgery, University of Kansas School of Medicine

Lisa M. Berglund, MD
Assistant Professor of Orthopaedic Surgery, University of Missouri-Kansas City School of Medicine

Greg S. Canty, MD
Medical Director, Sports Medicine Center; Fellowship Director – Sports Medicine, Assistant Professor of Orthopaedic Surgery and Pediatrics, University of Missouri-Kansas City School of Medicine

Christine J. Cheng, MD, MPH
Chief, Section of Hand Surgery; Pediatric Hand Surgeon; Clinical Assistant Professor of Pediatric Orthopaedic Surgery, University of Missouri-Kansas City School of Medicine

Margaret E. Gibson, MD
Associate Professor of Pediatrics, University of Missouri-Kansas City School of Medicine; Primary Care Sports Medicine Fellowship Director and Head Team Physician, University of Missouri-Kansas City School of Medicine

Brian Harvey, DO
Primary Care Sports Medicine, Assistant Professor of Orthopaedic Surgery, University of Missouri-Kansas City School of Medicine

Dale E. Jarka, MD
Associate Professor of Pediatric Orthopaedic Surgery, University of Missouri-Kansas City School of Medicine

Kathryn A. Keeler, MD
Assistant Professor of Pediatric Orthopaedic Surgery, University of Missouri-Kansas City School of Medicine

Kevin H. Latz, MD
Chief, Section of Sports Medicine; Director, Sports Medicine Center; Associate Professor of Pediatric Orthopaedic Surgery, University of Missouri-Kansas City School of Medicine

Donna M. Pacicca, MD
Associate Professor of Pediatric Orthopaedic Surgery, University of Missouri-Kansas City School of Medicine; Adjunct Professor of Oral and Craniofacial Science, University of Missouri-Kansas City School of Dentistry

Nigel J. Price, MD, FAAP
Pediatric Orthopaedic Surgeon; Chief, Section of Spine Surgery; Associate Professor of Pediatric Orthopaedic Surgery, University of Missouri-Kansas City School of Medicine; Clinical Assistant Professor of Orthopaedic Surgery, University of Kansas School of Medicine; Orthopaedics Associate Program Director, Truman Medical Center

James H. Roberson, MD
Primary Care Sports Medicine, Assistant Professor of Pediatric Orthopaedic Surgery, University of Missouri-Kansas City School of Medicine

Richard M. Schwend, MD, FAAP
Director, Orthopaedic Research Program; Professor Orthopaedic Surgery and Pediatrics, University of Missouri-Kansas City School of Medicine and University of Kansas School of Medicine

Mark R. Sinclair, MD
Assistant Professor of Pediatric Orthopaedic Surgery, University of Missouri-Kansas City School of Medicine

Micah K. Sinclair, MD
Pediatric Hand Surgery, Assistant Professor of Orthopaedic Surgery, University of Missouri-Kansas City School of Medicine

Natalie C. Stork, MD
Assistant Professor of Pediatric Orthopaedic Surgery, University of Missouri-Kansas City School of Medicine

Children's Mercy Kansas City

Children's Mercy Kansas City is an independent, non-profit, 367-bed pediatric health system, providing half a million patient encounters each year for children from across the country. Children's Mercy is ranked by U.S. News & World Report as one of "America's Best Children's Hospitals" and has received Magnet recognition four times for excellence in nursing services. In affiliation with the University of Missouri-Kansas City, our medical staff of more than 750 pediatric subspecialists and researchers are actively involved in clinical care, pediatric research, and educating the next generation of pediatric subspecialists. And our leadership in pediatric genomic medicine and clinical pharmacology is driving research and innovation in neonatology, heart care, cancer treatment and other subspecialties to find answers for children here and around the world.

Children's Mercy
KANSAS CITY

For children. For families. For answers.℠

To learn more about how we are transforming outcomes for orthopaedic surgery care, visit childrensmercy.org/orthopaedicsurgery

Orthopaedic Surgery and Musculoskeletal Science Office: (816) 234-3075

For transport, admissions or consults, call:
1 (800) GO MERCY / 1 (800) 466-3729

In academic affiliation with the
University of Missouri-Kansas City | EOE/AAE

UMKC
School of Medicine

MAGNET RECOGNIZED
AMERICAN NURSES CREDENTIALING CENTER

BEST CHILDREN'S HOSPITALS
U.S.News & WORLD REPORT
ORTHOPEDICS
2017-18

ORTHOPAEDIC SURGERY AND MUSCULOSKELETAL SCIENCE

2/18