

ORTHOPEDIC SURGERY AND MUSCULOSKELETAL SCIENCE

ANNUAL REPORT 2018-2019

Kathryn A. Keeler, MD

Martin Callaway



Children's Mercy
KANSAS CITY

LOVE WILL.

Like many of the children we care for in the Children's Mercy Kansas City Department of Orthopedics and Musculoskeletal Science, we have grown by leaps and bounds this past year. We're now officially a "department," of our own, and with that designation comes continued opportunities for expansion.

In fiscal year 2018, our team of 17 fellowship-trained orthopedic faculty, 23 advance practitioners, two physician assistants and physical therapists provided 43,000-plus clinic visits for our patients.

To top it off, U.S. News & World Report ranked the department 12th in the nation among pediatric orthopedic surgery programs. We are now one of the largest programs in the country in a free-standing pediatric hospital.

We reached this point by embracing a multidisciplinary collaborative approach that puts kids first. Referring physicians and parents often consult us to care for the most complicated pediatric cases. The Children's Mercy team is well-known for innovations in adolescent idiopathic scoliosis management strategies, sports medicine, hand surgery and a wide range of complex surgical treatments.

This year saw exciting developments, including the opening of our Sports Medicine program at Village West, and the Human Performance Lab, where athletes utilize advanced technology to both prevent and recover from injuries; and our experts in spine and neuromuscular surgeries analyze their patients' body mechanics, carefully planning their surgical strategies.

In the coming months, we look forward to developing a new subspecialty program focused on non-operative orthopedics. This program will care for children with neuromuscular and musculoskeletal conditions that are best treated with bracing and therapy. The department also is exploring the possibility of developing a section devoted to complex trauma.

The Accreditation Council for Graduate Medical Education (ACGME) and The Pediatric Orthopedic Society of North America have both approved the Pediatric Orthopedic Fellowship at Children's Mercy. We anticipate the Accreditation Council for Graduate Medical Education will approve the program soon. We hope to have our first fellow start the summer of 2020.

And finally, our prospective and retrospective research efforts are helping lead the way to better orthopedic treatments and therapies today and tomorrow for children in Kansas City, and around the globe.

As I reflect on the many advances we've made as a department, I'm proud of all we've accomplished for the kids and families who have entrusted us with their care in 2018.

Bradford W. Olney, MD
Chairman, Department of Orthopedics and Musculoskeletal Science



- 17 Pediatric Orthopedic Faculty
- 23 Advance Practitioners
- 2 Physician Assistants
- 43,000+ Orthopedic Clinic Visits in 2018



Martin's Story



Five-year-old Martin Callaway was adopted from Bulgaria when he was just 2 years old. Once back in their St. Joseph, Mo., home, his parents soon realized something was very wrong. Martin wasn't just not walking, but not crawling either. The diagnosis was cerebral palsy.

Martin required specialized complex care so that he could not only walk more efficiently, but also continue his favorite activity, riding his bicycle. "I love to ride my bike!" Martin added, enthusiastically.

Although Martin was in physical therapy and receiving regular botox injections, it was determined he would benefit from surgery for femoral anteversion to reposition his leg bones and release his tightened muscles. Prior to surgery, Martin visited the Human Performance Lab at Children's Mercy, which includes computer-assisted tracking devices to map his movements.

The lab is equipped with state-of-the-art technology that includes 19

3D cameras, a 16-channel wireless EMG and six force plates installed in the floor to simulate walking on a sidewalk, measuring pressure as movement progresses from the heel to toe and calculating force on ankle, hip and knee joints.

"3D Motion Capture and EMG together give us a full picture of how the patient is walking and moving, including forces and alignment," said Julie Musick, MS, PT, Director-PT/OT, Physical and Occupational Therapy. "We're able to view the patient's walking from different angles to help us understand the nature of how the individual moves."

Patients can be measured walking barefoot or with one or more assistive devices such as braces or a walker. Reflective markers adhered to the patient at bony landmarks including the shoulder, elbow, wrist, pelvis, hip, knee, ankle and foot are read by cameras using infrared rays; a skeletal model is produced via motion analysis to assist with surgical decision-making and pre- and post-op evaluation.

"It's the same technology used to make video games and movies, like Lord of the Rings and Avatar," said Jennifer Mathews, Motion Analysis Lab Coordinator, the first Biomedical Engineer hired by the Orthopedic department to manage the technical complexities of the equipment.

Data produced by the team can be valuable for making medical decisions in areas such as orthopedics, neurology, neurosurgery and rehabilitation medicine. The lab's studies provide data to guide treatment decisions such as orthopedic surgery, selective dorsal rhizotomy (SDR), baclofen pump implantation deep-brain stimulation and other procedures.

The lab has performed studies on patients from the Comprehensive Movement Disorders and Spasticity Clinic and after an absence of several years, a Rhizotomy (SDR) program is being re-established with procedures performed by Michael Partington, MD, MS, pediatric neurosurgeon.

The Human Performance Lab can accept referrals for patients ages 5 and up with neuromuscular disorders resulting from cerebral palsy, like Martin, brain injuries, prematurity or other abnormal gait conditions. But the lab does not provide diagnoses.

"This is an assessment tool that generates data for conditions that have already been diagnosed," Julie said. "We don't produce a clinical plan. We conduct the study; then a physician analyzes the data, interprets the results and discusses the report with the referring provider to develop a clinical plan."

"When I saw Martin and just watched him walk, I actually considered loosening up his calf muscles," Dr. Keeler said. "But the data from his study made it quite clear to me that loosening up his calf muscles would be the wrong thing to do. I actually altered my treatment plan based on the data from the lab."

During his surgery, Dr. Keeler lengthened Martin's thigh muscles to release the tension on his knees; then she cut and repositioned Martin's leg bones. A steel rod and screws hold the bones in place, properly aligning Martin's knees with his hips.

"Prior to surgery, Martin was not able to completely move his knees out because of his muscle tightness, and now he's able to move his knees to a 'frog leg' position," Dr. Keeler said. "I know for Martin, he's going to be excited that when he pedals his bicycle, he's not going to be hitting his knees against one another."

Just two weeks after surgery, Martin's father, Trevor, said his son was already doing things he thought he might never see, splashing and playing in the pool.

"Dr. Keeler was able to do a life-changing procedure that's going to change the way Martin moves," Trevor said. "With hard work and optimism, Martin's future is bright."

Abbey, Martin's mom added, "Before, he could not sit with his legs out straight in front of him and he could not cross his legs. Now, he can do both of those things with ease. He's also riding his bike at therapy and his knees aren't knocking together. Martin can so easily move in ways he could never move before." ■

“Using tools and technology, such as instrumented motion analysis, we are now able to look at exactly how an individual is moving,” said Kathryn Keeler, MD, pediatric orthopedic surgeon at Children's Mercy. “The computer helps calculate the angles, the degrees, the exact measurements. There are few children's hospitals that have a comprehensive movement center to take care of kids with neuromuscular disorders.”

CHILDREN'S MERCY RECEIVES ACS LEVEL 1 VERIFICATION



Children's Mercy was verified as a level 1 Children's Surgery Center by the American College of Surgeons in 2018. This means the hospital has met national quality and safety standards that only a handful of other children's hospitals have achieved. Children's Mercy is one of only 10 pediatric hospitals in the country, and the only hospital in Missouri and Kansas, to be verified as a Level 1 Children's Surgery Center.

Why Level 1 Verification Matters

Children's Mercy has the highest level of neonatal and pediatric intensive care units supported by every pediatric subspecialty, which is unique to the region. The hospital is prepared for any circumstance around the clock with pediatric specialists.

What many people don't realize is Children's Mercy can also take care of the less complex conditions; fractures, ear tubes, tonsils and endoscopy. The staff understands for parents there is no common or routine surgery, which is why every child has access to the

same resources and specialists that allowed the hospital to achieve the Level 1 verification.

These capabilities are important regardless of the type of surgery. Children's Mercy only has pediatric anesthesiologists who are vastly experienced. They not only provide comfort and limit anxiety, but understand the technical aspects of starting an IV when veins aren't visible, protecting small airways and fragile lungs, and producing an uneventful emergence from anesthesia.

The pediatric anesthesiologists administer anesthesia for more than 27,000 kids per year – that's 74 per day. Most adult hospitals only treat about 200 kids a year – less than one a day. While routine procedures go well the majority of the time in centers that are not dedicated to children, complications happen.

How are Hospitals Verified?

To become a verified center, Children's Mercy had to meet the following criteria:

- Have appropriately-trained and experienced staff to ensure the best surgical care for pediatric patients.
- Dedicated resources to take care of the most complex conditions.
- Provide ongoing education to families, community pediatricians, emergency personnel and fellowship programs.
- Participate in a national data registry that yields semiannual reports of quality for processes and outcomes, and identify opportunities for continuous quality improvements.
- Robust academic research program that brings evidence-based science into clinical practice at the bedside.

The review process was rigorous and stringent. After submitting a 75-page application, the hospital underwent a thorough site visit by an ACS team of surveyors who reviewed the hospital's structure, process and clinical outcomes. The team, which consisted of experienced children's surgeons, anesthesiologists and nurses, was onsite for two days and visited all areas of the hospital to make sure the people, resources, culture of safety and administrative support are in place to ensure patients receive the highest level of care. ■

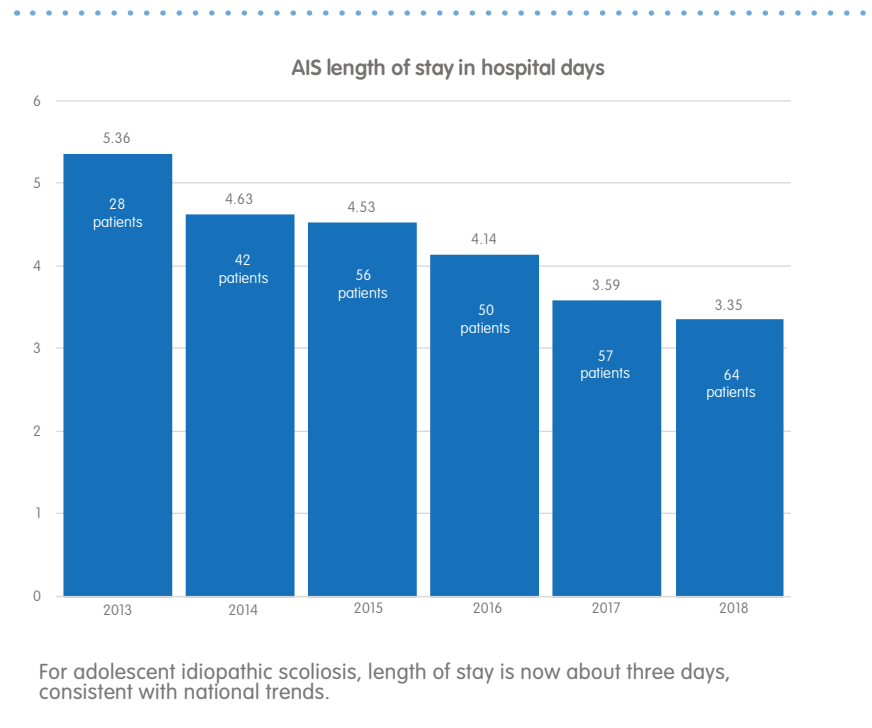


SURGICAL LEAN INITIATIVES

The Department of Orthopedics and Musculoskeletal Science has been passionate about safety, quality and value in providing better outcomes for our patients. This can only be accomplished by the team efforts of many people. By embracing Lean, we have been able to make changes to decrease patient LOS, contribute to cost savings, increase patient access and more. Below are a few recent examples:

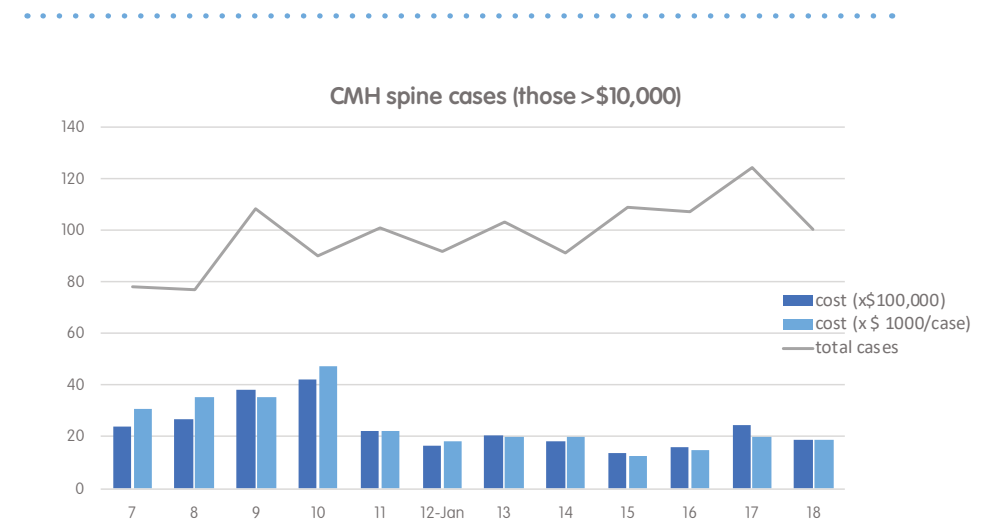
1. AIS Postoperative Pathway

Since 2013, the 6 Hall nursing staff (Bobby Carter, RN, and Priscilla Bell, RN) in collaboration with our inpatient staff (Anne Stuedeman, APRN, Michon Huston, PA, and Nicolette Clifford, APRN) have been working to decrease the length of stay of our adolescent scoliosis patients. By having a standardized postoperative protocol of direct admission to 6 Hall rather than to the ICU, the length of stay has decreased from over five days in 2013 to 3.35 days in 2018. This brings Children's Mercy in alignment with the national trend to have a three-day postoperative length of stay.



2. Implant Cost Savings

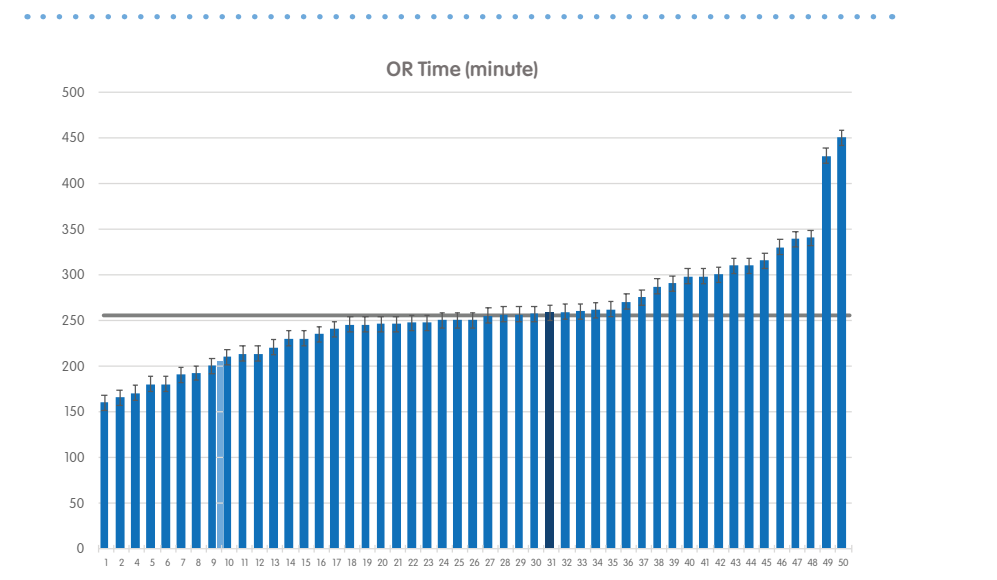
The Spine Section has worked in collaboration with Children's Mercy Purchasing under the leadership of Steve Elzey to decrease the cost of our spine implants. By 2010, this had hit a crisis level and costs kept increasing each year. By all surgeons agreeing to use the same spine implant system (at least 80% of the time), we estimate that we continue to save Children's Mercy \$2 million per year.



Since 2011, the Children's Mercy Department of Orthopedics and Musculoskeletal Science has been able to save \$2 million per year on the cost of spine implants.

3. Two Major Spine Cases in One Room/One Day/Two Surgeons

In 2017, we lost part of our Tuesday operating room time. Drs. Schwend and Anderson were required to share the room. Previously we had been only getting a single major spine case done in one day in room 17. By working as a team and being determined to provide better value to the patient and Children's Mercy, we have been able to complete two major AIS spine cases in one day in the same room. Our surgical times compared to 50 accomplished surgeons nationally (Setting Scoliosis Straight) have continued to decrease.



Two Children's Mercy surgeons working together have decreased operative time significantly compared nationally to 50 surgeons. This has also resulted in less blood loss for the patient. It is now possible to perform two major spine cases in the same room on the same day.



Screws are preselected the day before surgery, laid out in the operative field, readily available.



Before: 22 trays on the back table.

4. Preselection of Screws for Spine Surgery

By selecting the screws for a spine case the day before, we have been able to have fewer trays on the back table. This further saves on the cost of processing trays, the surgical scrub nurse has all the screws at the surgical site, and the surgeon just needs to place the screw that is readily available. This furthers our Lean process.

5. Decreasing the Number of Trays on the Surgical Field

Thanks to the work of Nicole Carr, RN, and her orthopedic team, applying Lean principles allowed us to greatly decrease the number of surgical trays on the operative field from 22 to six. Total weight decreased from 440 pounds to 220 pounds. By decreasing the number of spine instrument trays by 75% and pre-selecting screw implants one day in advance, value and throughput have

increased. With 112 multilevel spine deformity cases per year, we estimate a cost savings of nearly \$2,400 per case for a total of \$329,085 per year. Improved staff morale, ease of training, and patient and staff safety are other important potential areas of value we have observed.

6. Sports-related Fractures

Sports-related fractures pose challenges to student-athletes who want to return to their sport as quickly and safely as possible. Rapid access appointments with a sports medicine fellowship-trained physician for acute, non-operative sports-related fractures is important for correct diagnosis and management. In addition, sports medicine experts can decrease time spent away from sports participation. Using a quality improvement framework, rapid access scheduling guidelines were developed for sports-related fractures.



After: Only six trays needed.

Data were collected from January 2017 through November 2018. Scheduling guidelines were reviewed and the timeframe for scheduling sports-related fracture patients was changed. The previous guideline led to scheduling patients with a sports medicine physician within four to seven days of calling for an appointment. A new guideline was developed establishing that patients be scheduled within 72 hours. The sports medicine schedulers were educated on the new guideline, and the total number of sports-related fracture appointments and their scheduling timeframe was recorded each month. ■

Results

- The percentage of patients scheduled within 72 hours increased to 63% in 2017 and 80% in 2018.
- The percentage of patients scheduled within 72 hours increased 12% from 2016 to 2017.
- The percentage of patients scheduled within 72 hours increased 17% from 2017 to 2018.

Outcome Measure

Percent of sports-related fracture appointments scheduled within 72 hours.

Aim

By November 2018, increase the overall access of our patients with sports-related fractures into our Sports Medicine clinics within 72 hours of calling to schedule an appointment from a 2016 baseline of 51%.

SPORTS MEDICINE

Kevin Latz, Section Chief



The Children's Mercy Sports Medicine Team had a busy and productive year in 2018. Our team consists of seven pediatric sports medicine-trained physicians and surgeons, 15 sports physiotherapists, led by Jason Yoder, DPT, and Julie Musick, MS, PT, Director-PT/OT, Physical and Occupational Therapy, and 22 certified athletic trainers led by Nicole Fillingame. Our sports

physiotherapists see patients at three sites. Our athletic trainers are active throughout our clinical practice and in the community. In addition to serving various club sports, these professionals are embedded in the junior high and high schools of the Kansas City Public Schools, USD 500 (Wyandotte County), Turner School,

Piper School District, as well as Sporting Kansas City Academy. Arguably our biggest event of 2018 was our move into our new facility at Village West, a space we share with Sporting Kansas City and U.S. Soccer. The 25,000-square-foot space allows our sports medicine physicians to hold clinics, provides ample space for our sports physical therapists to see and treat our student athletes, and also houses our motion gait analysis lab. The 2,000-square-foot 3D motion analysis and human performance lab features 20 cameras. This state-of-the-art technology involves placing surface electrodes in key locations on the patient's body, then capturing video of the patient in motion.

We continue to have a significant research presence, with a focus on articular cartilage injuries, complications associated with common pediatric orthopedic sports medicine surgeries and various injury prevention projects. ■

UPPER EXTREMITY

Christine Cheng, Section Chief



The Section of Hand Surgery at Children's Mercy Kansas City boasts two full-time board-certified hand surgeons who only specialize in pediatric hand surgery, allowing us to offer full-service expertise to all our patients. Our surgeons are as comfortable treating routine conditions such as fractures and trigger thumbs, as complex brachial plexus injuries, spasticity disorders, arthrogryposis and congenital differences.

Micah Sinclair, MD, joined the department in October 2017, returning to her hometown of Kansas City after fellowship training at the University of Utah and serving as assistant professor at the University of Cincinnati. She brings her expertise in complex bony reconstruction, using state-of-the-art 3D computer modeling to correct complicated forearm deformities.

Christine Cheng, MD, section chief, is also incorporating technology in her clinical study on use of digital phone images to assess thumb motion after trigger thumb surgery.



Dr. Cheng and high school student at Perry Initiative workshop, Kansas City, 2018.

Program in Kansas City, a national STEM initiative program for high school females, and on a national level, as members of various committees in the American Society of Surgery of the Hand. They share their passion for pediatric hand surgery with their worldwide colleagues annually at the U.S. Pediatric Hand Study Group, and triennially at the World Symposium of Congenital Malformations of Hand and Upper Limb. They also share their mission for teaching with orthopedic residents and medical students in clinical settings and on research projects. Their ongoing research projects include common topics such as pediatric finger fractures and

Drs. Cheng and Sinclair are active in their field, both on a local level, as volunteers for the Perry Outreach

supracondylar elbow fractures, as well as more specialized subjects such as nerve transfers for brachial plexus palsies.

Collaboration is another theme for our hand surgeons. The hand team joins the Rehabilitation Medicine and Occupational Therapy teams in our multidisciplinary Brachial Plexus Clinic to provide comprehensive care to these complex patients. The hand surgeons perform initial nerve reconstructions and secondary hand, forearm and shoulder surgeries. Dr. Sinclair also has built relationships across longer distances on her mission trips to India, caring for children in need of specialized procedures there. Drs. Cheng and Sinclair find satisfaction daily in their work, offering all children "a hand up" as they wait to reach their highest potential. ■



(left) Congenital hand difference patient, right and left hands. (right) Waiting to reach my potential.

Pediatric Hand Surgery Team is Improving Outcomes with the Use of 3D Surgical Planning

Fractures of the forearm and elbow are some of the most common injuries that occur in children. Despite appropriate treatment, deformity can occur that is disabling to the patient. This deformity can occur at the time of treatment, or present after a number of years, due to changes in the bone with growth and because of the complex three-dimensional nature of the forearm and elbow, which cannot always be observed on plain radiographs.¹ When deformity correction is considered, the goal is to match the injured side to the uninjured side. Micah Sinclair, MD, is

using 3D computer modeling for surgical planning, working with an engineer to prepare for the surgery. This includes creation of a surgical plan, simulation of motion after correction of the deformity, and 3D printing surgical guides for the procedure. Using this technique has allowed for complex and, if necessary, multiple osteotomies, to reliably improve deformity in the forearm and regain maximal function for the patient.² ■



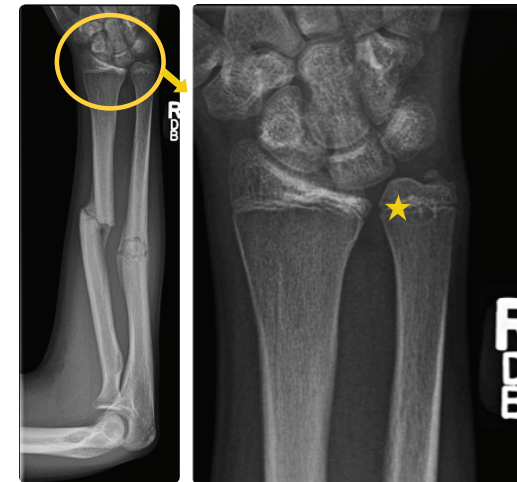
3D printed surgical technique.

References:

Anatomic Investigation of Commonly Used Landmarks for Evaluating Rotation During Forearm Fracture Reduction. Weinberg DS, Park PJ, Boden KA, Malone KJ, Cooperman DR, Liu RW. *J Bone Joint Surg Am.* 2016;98(13):1103-12.

Preoperative Computer Simulation and Patient-specific Guides are Safe and Effective to Correct Forearm Deformity in Children. Bauer AS, Storelli DAR, Sibbel SE, McCarroll HR, Lattanza LL. *J Pediatr Orthop.* 2017;37(7):504-510.

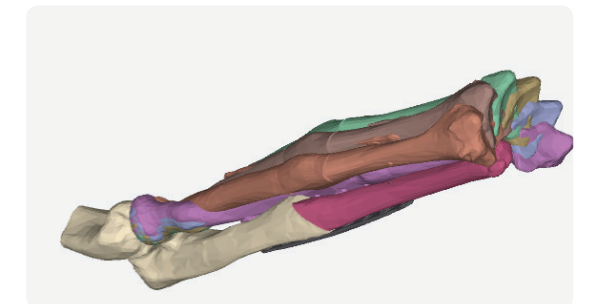
15-year-old boy with wrist pain due to wrist bones bumping against the ulna, (*) which is longer due to deformity after fracture healing.



Surgical correction with multiple osteotomies in one bone.



Healed following deformity correction. Patient is pain-free and playing baseball.



Computer-simulated motion after bone correction and fixation.

REGISTRIES AND SOCIETIES

Children's Mercy is active in a number of professional orthopedic registries and societies. The following is a list of some of the Registries and Societies with which the Department of Orthopedics and Musculoskeletal Science participates.



Casting with kindness, Kamala Landshut.

1. CSSG—Complex Spine Study Group. Early onset scoliosis (age <10 years). Mostly patients with vertical expandable prosthetic rib (VEPTR).
2. GSSG—Growing Spine Study Group. Early onset scoliosis (age < 10 years). Mostly children with growing rods or spine casting, but without VEPTR.
3. PRISM—Pediatric Research in Sports Medicine is a society devoted to all aspects of pediatric sports medicine, both operative and non-operative. There are several registries within PRISM, including: SCORE, a registry of complications related to ACL, tibia spine and meniscus surgery, and the MEMO registry related to medial epicondyle fracture treatment.
4. ROCK—is a society for the study of osteochondritis dissecans lesions (OCD).
5. Setting Scoliosis Straight—This is a project from the Harm's Study Group to develop normative data for performance in the surgical management of adolescent idiopathic scoliosis.
6. 3Greens—While not a traditional registry, this is a project funded by POSNA to establish checklists for the safety of spinal deformity surgery in children. Children's Mercy is a major

participant in this project.

7. ROTC—Registry of Orthopedic Trauma in Children (ROTC). Since November 2015, the Department of Orthopedics and Musculoskeletal Science at Children's Mercy has participated in a nationwide effort to better understand the care and treatment of significant extremity trauma in children and adolescents.

This effort started as an offshoot of the Major Extremity Trauma Research Consortium (METRC), a large group of trauma centers supported in part by the United States Department of Defense. Its mission was to study adult extremity trauma with an anticipated result of using this information to improve care of wounded veterans. The passion to help soldiers wounded in battle, and civilians with life and limb-threatening injuries return to the best functional status after trauma spread into the world of pediatric orthopedic surgery with the development of ROTC.

Of the six pediatric trauma centers nationwide contributing data to this study, Children's Mercy has been the busiest and the largest contributor of data to this important area of research.

The musculoskeletal system of a child

is undergoing constant growth and development. Injuries to the skeleton during growth can cause complications not seen in adults.

The study of injuries to the growth plates of children is a specific area of interest to the ROTC study group. Additionally, severe musculoskeletal injuries resulting in disability to the child and adolescent have a substantial impact on the individual's future given the decades of life and productivity ahead of them.

Studying ways to limit future disability and improve function in young patients by identifying the best forms of treatment and mounting effective prevention efforts is another area of active research by this group. A paper detailing ROTC's early results in this effort was presented at the annual Pediatric Orthopedic Surgeons of North America (POSNA) meeting in May 2019 and was among those being voted on for the honor of best trauma paper of the year. The Children's Mercy Department of Orthopedics and Musculoskeletal Science is very proud to be a leader in this effort to improve the care of major extremity trauma in children. ■

SPINE

Nigel Price, Section Chief



The spine section has been fully immersed in providing Lean principles of value-driven health care to patients. In addition to adolescent idiopathic patients, we currently recover most patients in the Post Anesthesia Care Unit. Only high-risk patients are going to the pediatric intensive care. Total length of stay is 3.4 days on average, down two days over the last five years. Through Lean OR principles we have reduced direct costs in the operating room by over \$300,000 per year. AIS infections have dropped to zero cases in the last six years.

We have expanded several programs in the last 24 months, including a robust MAGEC rod process for early onset scoliosis with ultrasound measurements at each visit. We have partnered with our orthotists to provide Rigo Cheneau bracing techniques, with Dr. Price and Brian Kerl (from Hanger) attending Manuel Rigo's BUFA course in Germany. We continue to expand our Schroth therapy program with our C1 and C2 therapists.

We will be expanding our clinical team with the addition of a non-operative physician who will help with the screening and treatment of back pain and spinal deformity in 2019.

Nurse Practitioners Are Essential Members of Our Team

The Department of Orthopedics and Musculoskeletal Science at Children's Mercy includes a unique group of nurse practitioners and a physician assistant who provide a variety of services that increase access to specialty pediatric orthopedic care.

These advanced practice providers complete a comprehensive training program that lasts from nine to 12 months, depending on their prior experience. The training program consists of guided reading, attendance at didactic lectures, time with each of our pediatric orthopedic surgeons, and clinical time with a preceptor in the clinic and Emergency Department (ED) setting. Procedures are tracked and documented, which includes care of a specified number of each type of fracture.

The primary responsibility of the Orthopedic ED team is to provide inpatient and ED consultation at the Children's Mercy Hospital Kansas campus, which does not have orthopedic resident coverage. Consultation is performed 24 hours a day, seven days per week. The majority of the consults occur in the ED and consist of acute fracture management, fracture reduction and casting. The ED staff provide sedation for performance of closed reductions in the ED. The rate of need for surgical management is less than that cited in professional literature. In 2018 the team performed 700 ED consults in the Children's Mercy Hospital Kansas ED.

The Orthopedic ED team also provides support to the orthopedic residents at the Adele Hall Campus during peak hours, seven days per week. This facilitates the flow of the pediatric orthopedic patients through the ED for 12 of the busiest hours per day, and allows the residents to assist in the operating room without impeding ED flow. The knowledge and technical skill

that the advanced practice providers have gained over time is beneficial to the learning experiences of the orthopedic residents, as well as the ED staff. In 2018, the team performed 760 ED consults at the Adele Hall Campus.

Fracture follow-up clinics for patients who have been seen at one of the Children's Mercy locations are held at both Children's Mercy Hospital Kansas and at the Adele Hall campus, constituting 2,900 visits in 2018. These clinics allow the orthopedic surgeons to concentrate on patients who have more complex problems. In addition, a weekly acute fracture care clinic is conducted at the Adele Hall Campus to accommodate patients who are referred from other facilities.

The clinic is staffed by an orthopedic surgeon, the Orthopedic ED team, and other residents and advanced practice providers as needed. The clinic provides the opportunity for scheduling patients who are seen for surgery or closed reduction in clinic with

anesthesia the same day. This weekly fracture clinic is an important service to families who have traveled more than an hour to obtain pediatric orthopedic care. In 2018, the fracture clinic provided care to more than 2,800 patients.

The Orthopedic ED team provides same-day fracture care at the Children's Mercy Hospital Kansas location Monday through Friday for referral from area physicians. Primary care providers have the ability to order radiographs at the Children's Mercy Hospital Kansas location and specify that they would like for the patient to be referred to the orthopedic clinic the same day for treatment of acute fractures.

The same-day fracture service saves the family from an ED or urgent care visit, since most primary care offices do not offer splinting and casting services. More than 300 patients were seen in this capacity in 2018. The ED



Front row, left to right: Alan Jenkins, FNP-C; Denise Brewster, DNP, CPNP; Veronica Byrne, CPNP; Clint Dziadosz, CPNP.

Back row, left to right: Sarah Fairchild, FNP-C; Tara Gustin, FNP-C; Carissa Danaher, FNP-C; Ashely Auffert, FNP-C; Kamala Landshut, PA-C; Polly Wimer, CPNP.

team also collaborates with two of Children's Mercy's off-site urgent care centers to determine the best course of treatment or referral for patients with orthopedic injuries.

The ED team is active in professional organizations such as the National Association of Pediatric Nurses and Practitioners (NAPNAP), National Association of Orthopedic Nurses (NAON), Pediatric Orthopedic Practitioner Society (POPS), and hold offices on different boards. ■

GLOBAL OUTREACH

Many members of the Department of Orthopedics and Musculoskeletal Science volunteer during their free time each year. The following are some of the projects in which staff participated in 2018.

Haiti

Members from the Department of Orthopedics and Musculoskeletal Medicine, with the assistance of their colleagues from anesthesia and nursing, have had a presence in southern Haiti (Jacmel) for more than two decades. Staff have worked with two Haitian-led organizations: Community Coalition for Haiti and Pazapa to deliver medical and surgical services to the children of this region. Additionally, members of the department have been passionate about providing education in pediatric orthopedics to Haitian orthopedic surgery residents and Haitian orthopedic surgeons so that they can become independent and provide the same quality of care long term after staff stop traveling to this region.

Uganda

Over the last 20 years, Val Thomas, APRN, has become involved in medical missions across the globe through the Medical Mission Foundation based in Kansas City, traveling on multiple trips, including Africa, Romania and

the Dominican Republic. The Medical Mission Foundation works to provide surgical and medical care in the most underserved global communities. The foundation works to provide basic medical and surgical care to improve the quality of life for the patients and to have a lasting impact on the regions visited by providing education and health resources. The ultimate goal is that one day the foundation's services will no longer be needed in specific areas, as the local health administration will have the skills and resources to provide care to its people.

The most recent trip that Thomas participated in was to Gulu, Uganda in 2017. The operating room teams performed 175 surgeries and 232 surgical consults in two locations.

Clinic teams consulted 2,014 patients in several locations. Surgery locations included St. Mary's Lacor Hospital and Gulu Regional Referral Hospitals. The majority of surgeries were routine, with the exception of three neonatal cases. Most of the cases at Gulu were burn scar revisions.



Gulu, Uganda.

The clinic team was expanded in 2017 to accommodate the high volume of malaria cases encountered in 2016. The clinic team spent two full days at two different health centers and an evening clinic partnering with a local grassroots NGO, Hashtag Gulu, which serves the needs of Gulu's street children. Forty-four children were treated that evening with three Lacor hospital referrals. Hashtag Gulu has now established relationships with local medical professionals and government officials. An additional clinic was organized for Sudanese refugees living in Gulu.

In the nine years that the Medical Missions Foundation has been working in Gulu, much has been accomplished. There have been 496 mission participants; 1,047 surgical procedures performed; 9,855 clinic visits conducted; and an amazing amount of collaboration, teaching, learning, and many ancillary projects, all having an enormous impact on the people and communities of Gulu.

India

India, a country of 1.3 billion people, is the second largest country in the world and makes up one-fifth of the world's population. Unfortunately, many of these people have little access to reliable health care, most often due to cost of care. Hospitals that provide reliable medical and surgical care at no cost to patients are limited. The Health and Care Foundation in Ahmedabad, India, formerly the Polio Foundation, began in 1987 as a multidisciplinary hospital providing care for children with polio, in addition to providing vaccinations. With the success of the vaccine, they have continued to provide complex multidisciplinary care to disabled children at no cost to families.

In January 2019, Micah Sinclair, MD, joined a surgical team from Cincinnati Children's Hospital Medical Center (CCHMC) in traveling to Ahmedabad, India to provide free surgical treatment to children with upper extremity deformities. The team has been making an annual trip to Ahmedabad



Micah Sinclair, MD, and colleagues, Ahmedabad, India.

for six years, starting initially with spine surgery. Dr. Sinclair has participated in three of the six trips, making it possible for the group to provide care of the upper extremity. The upper extremity procedures include patients with birth deformities, brachial plexus birth injuries, cerebral palsy, arthrogryposis and post-traumatic deformities. Each year an average of 20 upper extremity surgeries are provided, many of which include multiple procedures.

The trip has been coordinated and organized by orthopedic surgeons from CCHMC in conjunction with the Health and Care Foundation. The local orthopedic surgeons and anesthesiologists assist the physicians during these procedures, providing an opportunity for each team to participate in the complex medical decision-making process. This has been beneficial for educational purposes of the local orthopedic surgeons, who also provide the follow-up care for the children post-operatively. Educational lectures

are also provided as an evening continuing medical education event hosted by the Ahmedabad Orthopedic Association.

Future goals for the group: creating a sustained funding source for the mission and improved pre-operative preparation and communication, in order to streamline the care that is provided.

Ecuador

Ecuador is a low-income country of 15 million people, with a diverse geography and culture. We have had a very strong relationship with Ecuador since 2002. Project Perfect World is the NGO that works with the Roberto Gilbert Children's Hospital in Guayaquil, Ecuador. There are several service trips each year to care for children with unmet orthopedic needs. Over the years, we have increased our capacity to provide service to the hospital. Many Children's Mercy employees are volunteers, including operating room nurses and recovery room nurses.

Since 2008, Lorenza Jalinski, Children's Mercy Sterile Processing, has volunteered to assist with their sterile processing. We started the spine surgery program there in 2008, and because of Lorenza's careful service, we have never had a spine infection in the past 10 years. Brian Kerl, our orthotist, has been volunteering since 2008, creating a tremendous orthotics program.

We also have provided neurosurgery consultation and rehabilitation medicine. Other programs have included telemedicine, visiting Pediatric Orthopedic Society of North America (POSNA) and Scoliosis Research Society



Ecuador Team.



Dr. Schwend and an Ecuadorian surgeon.

(SRS) scholarships for Ecuadorian surgeons, UMKC resident scholarships to join us on the trips, a POSNA hip dysplasia conference and upcoming POSNA trauma course in October 2019.

We have several research projects, a Redcap database and International Hip Dysplasia Institute projects. Jhonny Melgar, MD, is the Chief of Orthopedics there and has been a POSNA-

supported scholar to Children's Mercy. He has a well-trained, professional staff who have been great colleagues over the 17 years we have been associated with their program.

At the 2018 SRS Meeting in Bologna, Italy, Dr. Schwend was awarded the SRS Walter S. Blount Humanitarian Award for his years of service providing pediatric spine care to the children of Ecuador. ■



Greg Hornig, MD, and Richard Schwend, MD, with their Ecuadorian colleagues.

Reference:

Fletcher AN, Schwend RM. The Ecuador Pediatric Spine Deformity Surgery Program. An SRS-GOP site 2008-2016. Spine Deform 2019 Mar;7(2):220-227 PMID 30660215.

Ukraine

Ukraine is a country of 40 million people in eastern Europe with a rich history tied to both Russia and Western Europe. We have been colleagues with several surgeons from Ukraine since 2007. Dr. Schwend first met Andrey Mezentsev and Dmytro Petrenko at the 2007 Scoliosis Research Society Meeting in Edinburgh. Since then they have become the first Ukrainian members of SRS, which is quite an honor for them. Both have been working at the Sytenko Institute of Spine and Joint Pathology in Kharkov, Ukraine, which is the most prestigious and oldest Orthopedic Institute in Ukraine.

Anatloiy Levytski and Aleks Korolkov also have been colleagues. Anatloiy is the professor of pediatric orthopedics at the Children's Hospital in Kiev and Aleks Korolkov is an accomplished hip surgeon in Kharkov. Over the past 10 years, Dr. Schwend has visited Kharkov in 2008, 2011 and 2013. During the 2013 visit, SRS had its first-ever international spine course in Kharkov.

Other exchanges have included Sergey Khmyzov visiting as a sponsored scholar to the POSNA annual meeting.

In October 2018, Drs. Anderson and Schwend were in Kiev speaking at and helping to run the recent trauma course "Management Solutions for Traumatic Injuries and Infections in Children." This was first course of the newly formed Ukraine Pediatric Orthopedic Association. Professor Levytski is their president and has been a close colleague with us since 2008. The Ukraine Pediatric Orthopedic Association is applying to have Alliance Membership status with POSNA, which will put them on a respected international standing. Andrey Mezentsev and Dmytro Petrenko continue to have exchanges with our team through our Telemedicine Program and the



John Anderson, MD, and Richard Schwend, MD, speaking at the first-ever Ukrainian Pediatric Orthopedic Association Trauma Course, Kiev, Ukraine, October 2018.

Vantage camera set up in operating room 17. They have watched over two dozen of our surgical spine cases.

Andrey Mezentsev and Dmytro Petrenko also led a delegation of faculty to Children's Mercy Hospital in January 2017 to learn modern hospital practices. Over the past 10 years we have continued to grow our friendship and professional relationship with these programs, and plan for further exchanges in the future.

Nepal

Nepal is a beautiful, but poor country of 30 million people, almost one-half of whom are children. The Hospital and Rehabilitation Center for Disabled Children was established in 1985 by U.S.-trained Ashok Banskota, MD, to care for the children of Nepal who otherwise were not receiving orthopedic services. Since the beginning, the hospital, through its center in Dhulikai, its five satellite clinics, surgical camps and 180 days of field work per year, has treated over 90,000 patients, performed 45,000 surgeries, and corrected over 10,000 club feet.

Bibek Banskota, MD, the son of founder Ashok Banskota is a UK-trained pediatric orthopedic surgeon and HRDC medical director. In 2017, Dr. Schwend was the POSNA presidential speaker to the Nepal Orthopedic Association meeting in Dhulikhel. In 2018 when Dr. Schwend was president of POSNA, Dr. Bibek Banskota was invited as his special guest to the POSNA annual meeting



Dr. Bibek Banskota and Dr. Schwend.

in Austin, Texas. Dr. Schwend returned to Dhulikhel in December 2018 for two weeks to assist Dr. Bibek Banskota in starting an Adolescent and Young Adult Hip Program. Patients were seen in clinic and surgical cases were done, including periacetabular osteotomies, surgical dislocations and hip fusion procedures. A national course in spine surgery, trauma and cerebral palsy also was successfully accomplished during that visit with funding from POSNA. Dr. Bibek Banskota has invited UMKC Orthopedic Chief Resident Joanne Marasigan, MD, to visit for training in the fall of 2019. ■



HRDC Hospital Nepal.



Drs. Ashok and Bibek Banskota.

INTERNATIONAL RESEARCH FELLOW

Zhenkai Wu, MD, PhD

During 2018, the Department of Orthopedic Surgery and Musculoskeletal Science was able to have its first one-year international fellow, Zhenkai Wu, MD, PhD, from Shanghai Jiaotong University School of Medicine, Department of Surgery. Dr. Wu received his medical training at Shanghai Medical College of Fudan University, Department of Clinic Medicine 1999-2007 and his postgraduate master degree at Shanghai Medical College of Fudan University 2004-2007. He received his postgraduate PhD from Shanghai Jiaotong University School of Medicine 2012-2015.

Since 2017, Dr. Wu has been an attending doctor, Department of Pediatric Orthopedics, Xin-Hua Hospital, affiliated to Shanghai Jiaotong University School of Medicine, Shanghai, P.R. China. Dr. Wu was the winner of the "Henri Bensahel Award" in the 36th SICOT Congress.

Dr. Wu joined the department in February 2018 and was our research fellow throughout 2018. He is married and the couple has a 2-year-old daughter, and they are living with his parents. His wife is a nurse, specializing in dialysis. They met each other in the hospital where they both work.

Dr. Wu's Research Interest

Dr. Wu has done clinical and experimental research on the growth-guided technique in China. While at Children's Mercy, his interest was neuromuscular scoliosis. Dr. Wu said that in China, they don't have very many children with severe GMFCS 5 cerebral palsy or other neuromuscular cases, especially in the younger children.

He said he has learned much, in the clinic, operating room and anesthesia care. His specific research interest was the anchoring and connection of the spine rods to the pelvic iliac screw foundation.

One finding in his research is that reconstructing the sagittal balance is a very important factor for reducing the failure of the implant system at the pelvis. The second finding is that growth-friendly technique with pelvic fixation is an advanced technique for the treatment of early onset neuromuscular patients. He also continues to work on secondary analysis of patients from the NIH-funded BrAIST database.

Since this was his first extended visit to the U.S., Dr. Wu also got to spend time learning about our culture. According to him, "Kansas City is very beautiful. Compared with Shanghai, the U.S. seems like a very big country. Kansas City is my favorite country life, peaceful and calm. Not very crowded, not too much rush hour. All the people here are very kind. You can see gorgeous views everywhere."

China's Training System

According to Dr. Wu, "We have a very different orthopedic training system.

In China, after graduating from high school, we have five years of medical study at the university. And then there are three years of general surgery training and three years of orthopedic training. We can then get a permanent job in a hospital, go through a test and become an attending doctor. After that, we can become a consultant doctor if you meet the criteria of your hospital, depending on the number of scientific papers research you have.

In China, all the good resources, doctors and funds are concentrated in the big public hospital affiliated with the medical college. After residency training, all the doctors look for a job in a big hospital. That is the reason why big hospitals get bigger and create medical resource imbalance. All the patients trust the big hospitals and the famous doctors. We don't have a reliable appointment policy. The patients can see a specialist at any time. The doctors in these big hospitals are very busy and they need to face more than 100 patients in a one-day clinic sometimes."

Culture

According to Dr. Wu, American culture is very different from China's. "American people like sports, are person-centered and like freedom. Chinese people like to obey, study and are family-centered. I very much enjoyed American culture, Thanksgiving day, Christmas day and football games. It seems like American people can work more freely. You can just focus on your interesting work without any official disturbance. In China, the doctor also needs to deal with their 'boss.'"

Medicine

"I have learned a lot about American medicine. It is a very 'mature' system. People can get the primary diagnosis and treatment from their PCP and they can be referred to a specialist, if necessary. The medical resource distribution is more reasonable. The public hospital can deal with more 'complicated' and severe disease. We all know the words, 'To Cure Sometimes, To Relieve Often, To



Dr. Wu attending a football game with the Children's Mercy orthopedic staff.

Comfort Always.' After working with Dr. Schwend, I finally know what those words really mean. I have learned how to talk with kids and their families kindly, relieve their anxiety, solve their problems. I have learned how to analyze the illness, make a diagnosis and treatment decision. ■

RESEARCH HIGHLIGHTS

Richard Schwend, MD, FAAP, FAOA



Dr. Schwend likes to discuss with other people, listen to other doctors' suggestions, never gets a decision arbitrarily. I think this is a most important merit I need to follow. Never 'screw up' at a wrong situation. Kids are not small adults. They are growing up. So we should treat them more conservatively. We sometimes can use some guided growth technique (less invasive) to let the kids correct some deformities by themselves."

Research

"Keep on studying. The medicine is improving quickly," Dr. Wu said. "It is impossible for you to know everything. So you need to read papers, join conferences and discuss with other doctors if possible. I have learned that you need to do each research strictly. A good idea and protocol, IRB approved, detailed plan and data collection are essential for good research. Cooperation is also very helpful for your research work." One other thing Dr. Wu learned from his experience was the importance of discussing indications before surgery,



Dr. Wu, center, at the POSNA Annual Meeting, Austin, Texas, May 2018.

as well as reviewing the cases after surgery.

"It is a very good opportunity for us to learn in the indication conference. I also hope to hold a conference on Fridays to review all the cases who underwent surgery the previous week," he said.

We plan to continue our collaboration with Dr. Wu in the future as he completes his research projects and comes up with new ideas. Good luck Dr. Wu! ■

The Department of Orthopedics and Musculoskeletal Medicine has a robust research program. Richard Schwend, MD, is the Director of Research and Julia Leamon, RN, is the Research Coordinator. All members of the department engage in clinical research. In 2018 we hosted Dr. Zhenkai Wu, from Shanghai Jiaotong University School of Medicine, Department of Surgery, Shanghai China, our first international scholar. Statistics for 2018 include 16 peer-reviewed publications, nine national or international research presentations, 29 invited lectures, five book chapters and one book. There were 16 retrospective IRB-approved studies and four prospective studies. ■

Summer scholars program

We continue to have a very successful Summer Scholars Program. Margaret Hornick, Paige Chase and Nya Wagala were our 2018 Orthopedic Summer Scholars. They were involved with the following projects during 2018:

.....
Maggie Hornick: Seymour Fracture Study, SCHF Post Op Pain Study.

Paige Chase: Prospective VR Study, LHCF Study and Pediatric Thrower's Fracture: Case study.

Nya Wagala: OR Time Study, Skeletal Age Study.

Awards

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Donna Pacicca, MD, was awarded the coveted Castle Connolly Top Doctor Award.
.....



Left to right: Emily Boschert, UMKC-SOM
Connor Stubblefield, KUMC-SOM
Maggie Hornick, KUMC-SOM
Paige Chase, KUMC-SOM
Grace Tideman, KUMC-SOM
Julia Leamon, RN, MSN, CPN

POSNA HONORS DR. SCHWEND WITH WALTER P. BLOUNT HUMANITARIAN AWARD



Richard Schwend, MD, Director of Research

Richard Schwend, MD, was honored with the Walter P. Blount Humanitarian Award at the Scoliosis Research Society's Annual Meeting in Bologna, Italy in 2018. The award acknowledges outstanding service to those with spinal deformity, and generosity to the profession and society.

Dr. Schwend's work with underserved patient populations began as a fourth-year medical student when he had to try hard to convince his dean of students to be able to do a three-month elective in rural Liberia, West Africa, after he had already been awarded a Wheaton College Fellowship.

Following his initial training in pediatrics, he spent three years in the Indian Health Service as a general medical officer in Zuni, New Mexico. As clinical director there, he helped to make the hospital the first government health care facility to be completely non-smoking. He received a commendation from the Surgeon General for this effort.

During his pediatric orthopedic fellowship in 1992, his staff mentor, Peter Waters, invited him and generously paid for a two-week trip to Romania, just after the fall of the communist dictator Ceausescu. Dr. Schwend learned the importance of "paying it forward" and of mentoring young people interested in this type of work from Dr. Waters. For many years he returned to Romania for service trips.

After his fellowship, Dr. Schwend returned to the Indian Health Service as the first pediatric orthopedic surgeon employed by USPHS, this time on the Navajo Reservation. For much of his career he continued to have outreach clinics in Shiprock, New Mexico.

In 2002, while deployed with the United States Air Force because of 9/11, he was asked to join a humanitarian project in Guayaquil, Ecuador. He met Sister Annie Credidio, a Catholic nun caring for the poor of Ecuador. She convinced him to come back the next

year, and the next ... This was the first of 18 years of continuous service to the children of Ecuador.

Started as a pediatric orthopedic program, the largest unmet need in Ecuador was identified by local staff to be pediatric spine deformity. After several years of infrastructure assistance and education, the Pediatric Spine Project started in 2008 and has continued to grow since then in cooperation with the Roberto Gilbert Hospital and local staff.

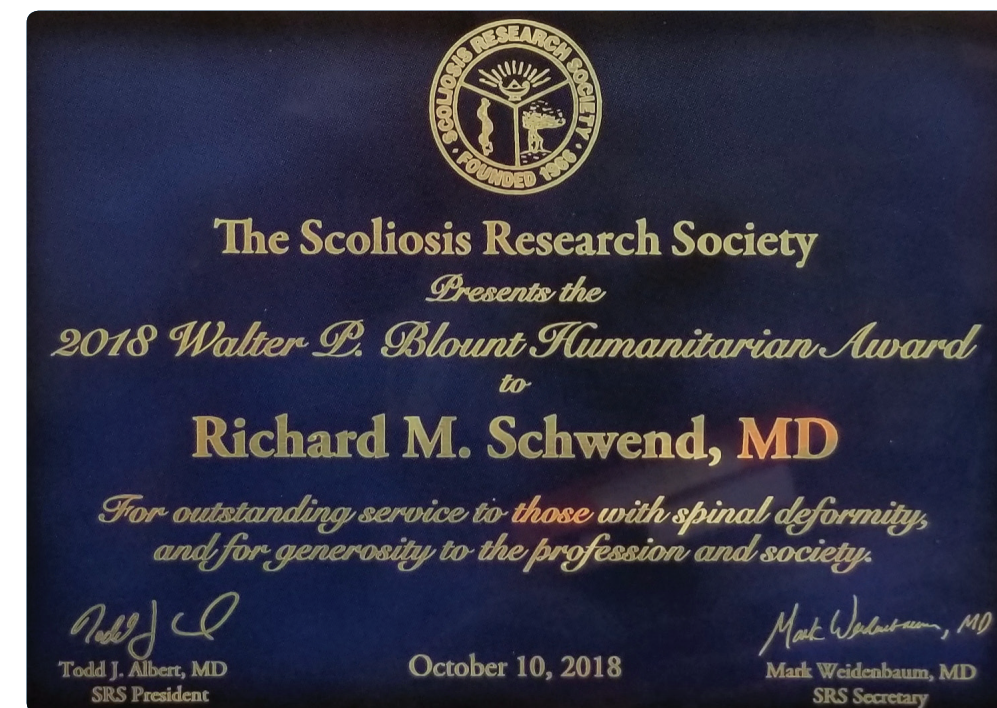
He is medical director of Project Perfect World, Ecuador, which sponsors the Ecuador Pediatric Spine Project. His research interests involve program development in regions with limited resources, pediatric spine and chest anatomy and surgical safety.

Dr. Schwend is the immediate past president of POSNA and was chair of the Orthopedic Section of the American Academy of Pediatrics from 2010-2014. While chair, he helped to develop the AAP scholarship program

for residents to have international global experiences under the guidance of a mentor.

He was a 2001 Scoliosis Research Society Traveling Fellow. He chaired the POSNA COUR committee from 2009-2011, as well as the POSNA Advocacy Committee and Practice Management Committee. He is chair of the SRS Health Policy Committee. Dr. Schwend received the POSNA Humanitarian Award in 2014 and the POSNA Special Effort Award in 2013.

After 23 years of service, Dr. Schwend is now a retired colonel, United States Air Force Reserves. He and his wife, Colleen, have two children, Ryan and Meghan, and one granddaughter. ■



National Research Publications

2016 SOSORT Guidelines: Orthopedic and Rehabilitation Treatment of Idiopathic Scoliosis During Growth Scoliosis and Spinal Disorders 2018 13:3. Negrini S, **Price N**, Zaina F.

Do Heavier Patients with Adolescent Idiopathic Scoliosis Have More Preserved Thoracic Kyphosis and Pulmonary Function? Tung R, Uvodich M, **Anderson JT**, et al. Spine Deformity 2018; 6 (6): 704-706.

Pediatric Cervical Spine Clearance: A Consensus Statement and Algorithm from the Pediatric Cervical Spine Clearance Working Group. Herman MJ, Brown KO, Sponseller PD, Phillips JH, Petrucelli PM, Parikh DJ, Mody KS, Leonard JC, Moront M, Brockmeyer DL, Anderson RCE, Alder AC, **Anderson JT**, Bernstein RM, Booth TN, Braga BP, Cahill PJ, Joglar JM, Martus JE, Neslami JO, Pahys JM, Rathjen KE, Riccio AI, Schulz JF, Stans AA, Shah MI, Warner WC, Yaszay B. J Bone Joint Surg Am 2019; 101:e1(1-9).

Current Issues Affecting the Practice of Pediatric Orthopedic Surgeons: Results of the 2014 Workforce Survey of American Academy of Pediatrics Section on Orthopedics. 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 as It Pertains to Pediatric Orthopedics from the Advocacy Committee of the Pediatric Orthopedic Society of North America. Raney E, VanBosse H, **Schwend RM**. JPO 2018 May/jun'38(5):e238-e244. PMID 29489736.

Low-Dose Versus High-dose Postoperative Naloxone Infusion Combined with Patient-controlled Analgesia for Adolescent Idiopathic Scoliosis Surgery. A Randomized Controlled Trial. Pieters BJ, **Anderson JT**, **Price N**, Anson LM, **Schwend RM**. Spine Deformity 2018 July-Aug;6(4):430-434. PMID 29886915.

Pediatric Lawnmower Injuries Presenting at a Level-I Trauma Center, 1995 to 2015: A Danger to Our Youngest Children. Fletcher AN, **Schwend RM**, Solano M, Wester C, Jarka DE. J Bone Joint Surg Am 2018 Oct 17;100(20): 1719-1727. PMID 30334881.

Pediatric Lawnmower Injuries and Strategies for Prevention: A Systematic Review. Talafhi NS, Ganley TJ, Shea KG, **Schwend RM**, Baldwin KD. JBJS Rev 2018 Dec;6(12):e9 PMID 30589748.

John E. Hall MD—Obituary. Emans JB, Millis MB, **Schwend RM**. J Bone Joint Surg AM 2018;100:2092.

Growth-friendly Spine Surgery in Escobar Syndrome. Margalit A, Sponseller PD, McCarthy RE, **Schwend RM**, et al. J Pediatr Orthop. 2019; in press.

The Ecuador Pediatric Spine Deformity Surgery Program. An SRS-GOP Site 2008-2016. Fletcher AN, **Schwend RM**. Spine Deform 2019 Mar;7(2):220-227. PMID 30660215.

Patterns of Pain in Adolescents with Slipped Capital Femoral Epiphysis. Uvodich M, **Schwend RM**, Stevanovic Ognjen, Wurster W, Leamon J, Hermanson A. The Journal of Pediatrics. 2019;206:184-9.

The Pediatric Orthopedic Society of North America (POSNA) Adopts a Member Health and Wellness Charter. Goldberg MJ, Shea KG, Weiss JM, Carter CW, Talwalkar VR, **Schwend RM**. J Pediatr Orthop. April 2019;39(4):e241-e244.

Pediatric Orthopaedic Surgeons Dissatisfied in On-Call Practices Despite Improving Call Conditions. The 2015 POSNA Membership Survey Regarding Trauma Care. Lind A, **Latz K**, **Sinclair MR**, Williams DD. J Pediatr Orthop 2018 Feb;38(2):e33-e37.

Can a Septic Hip Decision Rule Aid in the Evaluation of Suspected Pediatric Musculoskeletal Infections? Patel L, Michael J, Schroeder L, Sherman AK, **Berglund L**, Newland JG. Med Journal of Emergency Medicine, 2019-03-01, Volume 56, Issue 3, Pages 241-247.

National Presentations and Posters

The Effects of Physiologic Loading on Bone: An Analysis of Primary Osteocytes Using Next Generation Sequencing. **Pacicca D**, Brown T, Johnston J, Twist G, Gibson M, Farrow E. Orthopedic Research Society Annual Meeting, Austin, Texas, Feb. 2-5, 2019.

Handedness in Unilateral Pediatric Hand Conditions. **Cheng CJ**. Pediatric Hand.

Study Group Annual Meeting, Nationwide Children's Hospital. Columbus, Ohio. April 2018.

Primary Spinal Epidural/Extramedullary Ewing Sarcoma in Young Female Patients. Fletcher A, Marasigan J, **Schwend RM**, **Anderson JT**, et al. E-poster for the International Spinal Deformity Symposium, Nov. 30-Dec. 1, 2018, New York, N.Y.

Treatment Adherence to AAOS Appropriate Use Criteria (AUC) for Type III Supracondylar Humerus Fractures Among Pediatric Orthopedics. Emanuelli E, Stevanovic O, Klott J, Uvodich M, Sherman A, **Schwend R**. POSNA Annual meeting. Austin Texas, May 9-12, 2018.

Pediatric Lawnmower Injuries 1995-2015. A Grave Threat to Our Youngest Children. Fletcher AN, **Schwend RM**, Wester C, Solano M, **Jarka DE**. AAP NCE 2018 Section on Orthopedics, Nov. 2-6, 2018.

Predictors of Acceptable and Unacceptable Appearance of Shoulder Balance in Adolescent Idiopathic Scoliosis. Hiett A, Tung R, Emanuelli E, **Anderson JT**, **Schwend RM**, Sherman A. AAP NCE 2018 Section on Orthopedics, Nov. 2-6, 2018.

The Ecuador Pediatric Spine Deformity Surgery Program Development and Outcomes. Fletcher A, **Schwend RM**. An SRS-GOP site. 2008-2014. AAP NCE 2018 Section on Orthopedics, Nov. 2-6, 2018.

Registry of Orthopaedic Trauma in Children (RÖTC): A Pilot Study. Vanderhave K, Seymour R, Cassidy J, Martus J, Scannell B, Scherl S, Silva M, **Sinclair MR**, Churchill C, Wally M, Hardison E. Pediatric Orthopaedic Society of North America Annual Meeting, May 15, 2019, Charlotte, N.C.

The Rate of Mediastinal and Vascular Injury Following Acute Posterior Sternoclavicular Dislocation. Fournier M, **Sinclair MR**, Zheng E, Spiegel D, Johnson A, Shah A, Riccio A, Elliott M, Bae D, Sawyer J. Pediatric Orthopaedic Society of North America Annual Meeting, May 17, 2019, Charlotte, N.C.

Book Chapters

Sub-axial Cervical Spine Injuries. **Anderson JT**. In Phillips J, Shah S, Yaszay B, Hedequist D, eds. The Management of Disorders of the Child's Cervical Spine. Springer U.S., 2018.

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.

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

Developmental Dysplasia of the Hip. **Schwend RM**. In Gosselin RA, Spiegel DA, Foltz M editors. Global Orthoedics. Springer. New York, Deidelberg, Dordrecht, London 2019.

OKU 13, Chapter 55 - Pediatric Upper Extremity Disorders. **Sinclair MK**. In press.



Books

Back Pain in the Young Child and Adolescent - A Case-Based Guide. **Schwend RM**, Hennrikus editors. Springer. Due to be published September 2019.

National Advocacy

Pacicca D. Advocacy Committee, ORS, 2018-2020.

Schwend RM. President POSNA 2018, Chair Nominating Committee POSNA.

Sinclair M. Chair POSNA Trauma Committee.

Stuedemann AE. President Pediatric Orthopaedic Practitioner's Society (POPS) 2017-201.

Invited Lectures

Sinclair MK. ASSH 2018 Interactive Case Review Faculty - Hand Injuries in the Athlete.

Pacicca D. Advanced Biomaterials course guest lecturer, "Orthopedic Surgery and Biomaterials," University of Kansas School of Engineering, Lawrence, Kan., October 2018.

Anderson JT. Invited Faculty. Cervical Spine Trauma, Principles of High-Energy Trauma and Triage and Osteomyelitis. Ukrainian First International Pediatric Trauma Course. Oct. 25-26, 2018, Kiev, Ukraine.

Schwend RM. Invited as POSNA Presidential Guest Speaker and Visiting Professor, Campbell Clinic, Memphis, Tenn., January 2018.

Schwend RM. Invited as POSNA Presidential Guest Speaker (Robert Abrams Visiting Professorship) and Visiting Professor, University of Maryland, Sept. 5-6, 2018.

Robert C. Abrams Lecture: The Ecuador Pediatric Orthopedic Spine Program. Why Have a Long-term Relationship?

Differential Rod Contouring and Other Techniques for 3D Correction of Spine Deformity.

Schwend RM. POSNA Immediate Past President. POSNA-Ukraine Pediatric Orthopedic Association. First International Pediatric Trauma Course. Guest Speaker, Oct. 25, 2018:

- General Principles of Fracture Care
- Spinal Cord Injury
- Pelvis and Hip Trauma in Children
- Septic Arthritis of the Hip

Schwend RM. IPOS, Orlando, Fla., Nov. 27-30, 2018:

- Evidence-based and Personal Experience-based Ways to Prevent Surgical Spine Infection
- Wellness in International Work
- Global Burden of Disease: Infection. What is the Burden of Musculoskeletal Infection Worldwide?
- Guided Growth: Fusionless Non-locking Set Screw

Schwend RM, POSNA Immediate Past President. POSNA-HRDC Pediatric Orthopedic Course. Dhulikhel, Nepal, Dec. 17-18, 2018:

- Classification of Pediatric Spinal Deformity
- Growth of the Thorax and Lungs in Relation to Growth of the Normal and Deformed Spine
- Definition, Etiology and Clinical Evaluation of AIS
- Osteotomies for AIS—When and How
- Prevention of Surgical Site Infection After Spine Surgery. Prevention and Management of Post-operative Neurological Deficit
- Pelvis Fractures
- Wrist and Forearm Fractures
- Shaft of the Humerus Fractures

Schwend RM. Visiting Professor. Harvard Combined Orthopedic Residency Program, March 20, 2019:

- 3D AIS Spine Deformity—The Value of Our Work

Stuedemann AE. IPOS, Orlando, Fla., Nov. 27-30, 2018:

- Perioperative Management of the CP Patient
- Patient and Provider Wellness: What About the Tea

Early Onset Scoliosis Combined SOSORT/SRS Webinar Panelist. **Price N**.

Co-Chairs: Stephanie Holmes, MD and **Mark Sinclair**, MD. POSNA 2019. The Optimal Care of the Injured Pediatric Orthopaedic Patient.

Co-Chairs: **Mark Sinclair** (Kansas City) and Stephanie Holmes (Salt Lake), Pediatric Orthopaedic Society of North America Annual Meeting, May 16, 2019.

Subspecialty Day: Trauma. Co-Chairs: **Mark Sinclair** and Andrew Howard. Pediatric Orthopaedic Society of North America Annual Meeting, May 17, 2019.

Pediatric Mass Casualty Care Considerations. **Sinclair MR**. American Academy of Orthopaedic Surgeons Annual Meeting Presidential Symposium, March 15, 2019, Las Vegas, Nev.

ORTHOPEDIC SURGERY AND MUSCULOSKELETAL SCIENCE FACULTY

Leadership



Bradford W. Olney, MD
Chairman, Department of Orthopedic Surgery and Musculoskeletal Science

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Pediatric Orthopedic Surgery



Greg S. Canty, MD
Medical Director, Sports Medicine Center; Fellowship Director, Sports Medicine



Margaret E. Gibson, MD
Family Medicine; Sports Medicine



Lisa M. Berglund, MD
Pediatric Orthopedic Surgery



Christine J. Cheng, MD, MPH
Chief, Section of Hand Surgery



Brian Harvey, DO
Pediatric Orthopedic Surgery



Dale E. Jarka, MD
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Kathryn A. Keeler, MD
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James H. Roberson, MD
Sports Medicine



Richard M. Schwend, MD, FAAP FAOA
Director, Orthopedic Research Program



Mark R. Sinclair, MD
Pediatric Orthopedic Surgery



Micah K. Sinclair, MD
Pediatric Hand Surgery



Natalie C. Stork, MD
Pediatric Non-operative Orthopedics; Sports Medicine

Children's Mercy Kansas City

Children's Mercy Kansas City is ranked as one of "America's Best Children's Hospitals" in all 10 specialties rated by U.S. News & World Report and has received Magnet™ recognition for excellence in nursing services four consecutive times. With 366 licensed beds and a medical staff of more than 750 pediatric subspecialists, we care for children from all 50 states and from around the world. In addition, our leadership in pediatric genomic medicine and individualized pediatric therapeutics is driving research and innovation in neonatology, nephrology, endocrinology, gastroenterology, neurology, heart, cancer and other subspecialties to transform outcomes for children. Children's Mercy also is nationally recognized for innovation in psychosocial care and creating a family-centered environment focused on the unique needs of hospitalized children and their families. Our love for children powers everything we do, inspiring our research, innovations and our everyday care. Because love has no limits. And with it, neither do we.



LOVE WILL.

To learn more about how love is driving us to improve orthopedic care, visit childrensmercy.org/orthopedics.

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

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