

Team first in region to use Magnetic Expansion Control

New device provides non-invasive treatment for early-onset scoliosis

The Le Bonheur/Campbell Clinic orthopaedic team is the first in the southeast region to offer Magnetic Expansion Control (MAGEC) for children with early-onset scoliosis. The device allows surgeons to straighten a patient's spine gradually and non-invasively – a stark alternative to traditional growing rods, which require surgical procedures every six months to lengthen the rods and correct the spine's curvature.

Sage Downey, 8, of Toxey, Ala., was the first Le Bonheur patient to receive a MAGEC device and only the 10th in the United States since the device received FDA approval. For her family, the device offers new hope and relief from the pre-operation anxiety Sage endured before every traditional rod lengthening.

Sage, who has arthrogryposis, had developed neuromuscular scoliosis by the time she was 6 months old. Knowing her condition would progress, the Downeys looked for doctor who could offer Sage the best care possible throughout her childhood and adolescent years.

"We had known about the device's pending approval in the U.S.



Jeffrey R. Sawyer, MD, and MAGEC patient Sage Downey

for a few years and knew we wanted a surgeon who would stay on top of the latest developments in scoliosis treatment," said Sage's mom, Janet Downey.

The Downeys first met with Jeffrey R. Sawyer, MD, a Le Bonheur/Campbell Clinic pediatric orthopaedic surgeon, in October 2011. They discussed Sage's plan of care and the future option of Magnetic Expansion Control. Sage had previously been treated with braces

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Dedicated clinic treats children with hand deformities, injuries

The Le Bonheur/Campbell Clinic Pediatric Hand Clinic opened in February 2013 to treat children with congenital abnormalities or traumatic injuries of the hand and upper extremities.

"We saw a huge need for this type of care in our region," said Orthopaedic Surgeon Benjamin Mauck, MD, who leads the clinic. "Patients were having to travel long distances for treatment [before the clinic opened] or simply weren't getting the care they needed."

Mauck joined the Le Bonheur/Campbell Clinic team in 2012 after completing a hand surgery fellowship at the University of Texas Health Science Center in San Antonio.

"The human hand is so important to what makes us human – how we interact with the world around us and each other," said Mauck about choosing his specialty. "I wanted to be a part of restoring a patients' ability to do that."

Common abnormalities Mauck sees in clinic include duplicated digits, syndactyly, growth deficiencies and more.

Patient Thomas "Cayden" Vaughn of Grenada, Miss., was born with a form of arthrogryposis, a genetic neuro-musculo-skeletal disorder that primarily affected his hands and feet.

Mauck released the 4-year-old's clasped thumbs by lengthening and releasing muscles and tendons in his hands and through a partial fusion of his thumb joint in October.

"We love Dr. Mauck and are so happy with how Cayden's procedure turned out," said mom Kaitlynn Vaughn, who was born

with the same condition.

In addition to the most advanced surgical and non-surgical treatment options, patients have access to a specialized care team that includes pediatric radiologists, an occupational therapist and child life specialists.

"Our multidisciplinary care team is so important to how well these patients recover," said Mauck. "Many times, patients need complex operations and, because of that, very difficult and challenging rehabilitation. Without a dedicated therapist and child life specialist to help the patient recover, operative intervention is useless."



Cayden Vaughn, 4, sees Orthopaedic Surgeon Benjamin Mauck, MD, in Le Bonheur/Campbell Clinic Pediatric Hand Clinic regularly since his procedure last October. Vaughn was born with arthrogryposis and clasped thumbs.

Research Spotlight

7 papers presented at EPOS meeting

Seven Le Bonheur/Campbell Clinic studies were accepted for poster and podium presentations at the April European Paediatric Orthopaedic Society (EPOS) annual meeting in Belgium. The team delivered presentations on:

- Classifying femoral shaft fractures in children:** Classifications of femoral fractures in young children is highly variable among different specialists, according to the team's findings. The study looked at intraobserver and interobserver variability in defining femoral fracture patterns, which is important in identifying non-accidental trauma in children.
Intra and Inter-Observer Reliability and the Role of Fracture Morphology in Classifying Femoral Shaft Fractures in Children. Norfleet Thompson, MD; Derek M. Kelly, MD; Rush, William C. Warner Jr, MD; David D. Spence, MD; James H. Beaty, MD; Alice Moisan, RN; Jeffrey R. Sawyer, MD (poster).
- Sub-axial cervical spine injuries:** The retrospective study characterized pediatric sub-axial cervical spine injuries by type, neurologic injury, associated non-spine injuries and treatment. Researchers reviewed the medical records of 111 patients and found that isolated fractures account for the majority of sub-axial cervical spine injuries in children and most were treated with a c-collar. Other findings showed that neurological deficits and associated non-spine injuries are common, and adolescent patients were more likely to sustain multiple spine injuries, both contiguous and non-contiguous.
Sub-axial Cervical Spine Injuries in Children and Adolescents. Robert F. Murphy, MD; Austin R. Davidson, BS; William C. Warner Jr, MD; Derek M. Kelly, MD; David D. Spence, MD; and Jeffrey R. Sawyer MD (poster).
- Identifying non-accidental fractures:** Researchers found that, in children, transverse femoral shaft fractures are a better predictor of non-accidental trauma than spiral fractures, which have long been cited as indications of non-accidental trauma. The study looked at 95 patients younger than 3 years, calculating their AP and lateral fracture ratios. Patients with confirmed non-accidental trauma had significantly lower fracture ratios (transverse fracture pattern) on the AP and lateral radiographs.
Transverse Femoral Shaft Fractures are a Better Predictor of Non-Accidental Trauma than Spiral Fractures in Young Children. Ryan Murphy, BS; Derek M. Kelly MD; William C. Warner Jr, MD; Alice Moisan, RN; Norfleet Thompson, MD; David D. Spence, MD; James H. Beaty, MD; Jeffrey R. Sawyer, MD (poster).
- Musculoskeletal infection:** Findings show Interleukin-6 (IL-6), an immune protein, might be a valid marker for musculoskeletal infection. Researchers collected IL-6 serum levels from 12 pediatric patients with a suspected musculoskeletal infection and examined them in triplicate using a Quantikine ELISA assay (R&D Systems). Eight patients were diagnosed with suppurative musculoskeletal infection (mean IL-6 level of 214.5 pg/ml), while four patients were diagnosed with "other" etiologies (mean IL-6 level of 68.63 pg/ml). Further research is in progress.
Interleukin-6 in Pediatric Musculoskeletal Infection: A Pilot Study. Byron F. Stephens, MD; Jeffrey R. Sawyer, MD; William C. Warner, MD; James H. Beaty, MD; David D. Spence, MD; Alice A. Moisan, BSN; and Derek M. Kelly, MD (podium).
- Pediatric femur fracture treatment:** Researchers used the U.S. Kids' Inpatient Database (KID) to review trends in treating pediatric femur fractures in a 12-year period. Findings showed an increased popularity in recent years of open reduction and internal fixation as a choice of treatment for femur fracture in children ages 5 to 9 years. There is evidence that pediatric femur fractures are now treated more commonly with internal fixation, which is utilized in the younger age groups.
Changes in the Treatment of Pediatric Femur Fractures: Trends from United States Kids' Inpatient Database (KID). Sameer M. Naranje, MD; Derek M. Kelly, MD; Jeffrey R. Sawyer, MD; Tamekia L. Jones, PhD; James H. Beaty, MD (podium).
- Tibial tubercle fractures:** The comprehensive study looked at pediatric tibial tubercle fracture treatment methods, as well as evidence on associated injuries and functional and radiological outcomes. Highlights from the research include:
 - Average age at surgery was 14.6 years
 - Most common fracture reported was type III
 - Associated injury rate was 4.1 percent (more common in type III fractures)
 - ORIF was performed in 98 percent of cases
 - Fracture consolidation was achieved in 99 percent of cases
 - Overall complication rate was 28 percent (removal of hardware due to bursitis was most common complication)*Outcomes and Complications of Tibial Tubercle Fractures within the Pediatric Population. A Systematic Review of the Literature.* Juan Pretell-Mazzini, MD; Vinayak Perake, MD; Derek M. Kelly, MD; Jeffrey R Sawyer, MD; Alice A Moisan, BSN; David D Spence, MD; William C Warner, Jr, MD; James H Beaty, MD (poster).
- Isolated anterior interosseous nerve (AIN) injuries:** The multi-center study looked at the rate of isolated AIN injuries in supracondylar humerus fractures and their long-term outcomes. Of those patients with an isolated AIN injury, average time to surgery was 14.6 hours. Complete return of AIN function was found in 84 percent of cases with an average time to partial return of about 37 days. Full return of function is expected in most cases within five months. Emergent surgical intervention did not affect time to recovery of full AIN function.
Supracondylar Fractures with Isolated Anterior Interosseous Nerve Injuries: Are they Urgent Cases? Kody K. Barrett, BA; David L. Skaggs, MD; Jeffrey R. Sawyer, MD; Lindsay Andras, MD; Alice Moisan, BSN, RN, CCRP; Christine Goodbody, BS; Jack Flynn, MD (podium).



Ortho recognized by U.S. News & World Report

U.S. News & World Report again has named the Le Bonheur/Campbell Clinic team among the nation's top pediatric orthopaedic programs.

Le Bonheur was also recognized in six other specialties – cardiology/heart surgery, neonatology, nephrology, neurology/neurosurgery, pulmonology and urology.

"We are thrilled to be recognized as one of the country's best children's hospitals," said Le Bonheur Children's President and CEO Meri Armour, MSN/MBA. "We use the U.S. News process as a way to improve the care we offer children. It is our responsibility as health experts to give our children every opportunity to grow up healthy and strong."



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and body casting techniques to slow the growth of her spine curvature. Waiting for MAGEC to become available, Sage underwent halo traction and VEPTR (Vertical Expandable Titanium Rib) implantation under Sawyer's care – five surgeries in all and plenty of overnight stays at Le Bonheur.

On May 7, Sage had a sixth surgery – this time to implant a MAGEC device. Using an external magnet, Sawyer expanded the rods for the first time on July 16.

"It was such a difference," said Janet. "Sawyer did the expansion in clinic. There was no anesthesia, no incisions – we were eating lunch with Sage an hour later. We couldn't believe it."

The non-invasive procedure also meant Sage could go home the same day and didn't have to worry about recovery time and the infection risks that accompany surgical incisions. Like traditional growing rods, MAGEC devices need to be expanded every six months during the child's growing years. Sage will continue with MAGEC treatment until she can have a final corrective surgery when she's older, says Janet.

"MAGEC is a true-game changer in pediatric scoliosis care. "Saving a child from surgery every six months will have a significant, positive impact on their care," Sawyer said.



Magnetic Expansion Control

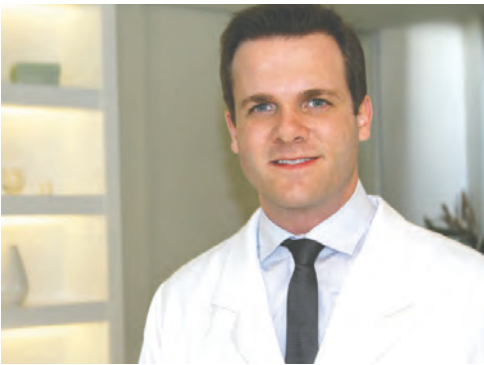
Former fellow brings lessons learned to Brazil

When pediatric orthopaedic surgeon Nelson Astur, MD, wanted to learn more about the pediatric spine, he turned to Campbell Clinic Orthopaedics. Astur had already completed fellowship training in his home country, Brazil, but wanted to learn more about pediatric spinal deformities and early-onset scoliosis treatments like VEPTR (Vertical Expandable Prosthetic Titanium Rib). So he applied for another fellowship.

“Ever since I started my orthopaedic residency program in Sao Paulo, residents have had two ‘Bible’ books to follow: *Rockwood’s Fractures in Adults and Campbell’s Operative Orthopaedics*. I could never have imagined I would be part of Campbell Clinic someday,” said Astur. “It was an honor for me to apply for a position at Campbell Clinic — even greater to get accepted.”

Three years after graduating from the year-long fellowship program under the supervision of Pediatric Orthopaedic Surgeon Jeffrey Sawyer, MD, Astur is using what he learned to better care for children in Brazil. He credits the team at Le Bonheur and Campbell Clinic for teaching him a wide range of skills – from clinic structuring and organization to research and academic teaching. Astur has also been able to bring new surgical techniques to his practice in Brazil.

“Before my fellowship, patients with early-onset scoliosis in the university hospital I staff were treated with fusion and old-school techniques,” said Astur. “Now, we now have a group of early-onset scoliosis patients treated with growing sparing/growth modulation surgical techniques. Eight patients have already received a VEPTR implantation.”



Nelson Astur, MD

Astur works on staff at two hospitals in Sao Paulo, and also works at his family’s private practice. Astur says he’s dedicated to teaching each of his fellows and orthopaedic residents what he learned at Le Bonheur and Campbell Clinic. Following in his teacher’s footsteps, one of Astur’s fellows is even applying for the Le Bonheur/Campbell Clinic 2015/16 fellowship program.

Case Study: Spine Trauma

Pre-teen nearly paralyzed after ATV accident

After an all-terrain vehicle (ATV) accident last May, Kristyn Wright, 12, was given a 50/50 shot of ever walking again. Kristyn had just finished fifth grade and was riding the ATV down a country road in her hometown of Pontotoc, Miss., when she swerved to miss an oncoming car. She landed in a ditch, and the ATV rolled on top of her.

“The driver stopped to help Kristyn and called her dad,” said mom, Lorna Wright. “I was scared to death, hoping she’d be OK. She wasn’t crying because she was just in shock.”

Kristyn was airlifted about 100 miles to Le Bonheur Children’s. Scans showed she had a T12 compression fracture, L1 burst fracture and a compromised spinal cord injury at T12 and L1. Le Bonheur orthopaedic surgeons Derek Kelly, MD, and Jeffrey Sawyer, MD, fused her vertebrae from T10 to L3, and Frederick Boop, MD, chairman of the Department of Neurosurgery, decompressed her spinal cord.

“As with most complex spine trauma surgery at our hospital, Kristyn’s surgery was performed with a team of neurosurgeons and orthopaedic surgeons,” said Kelly. “We worked closely together to maximize Kristyn’s shot at a complete recovery.”



Kristyn Wright in therapy at Le Bonheur.



Kristyn Wright

her physical therapists for helping Kristyn walk again.

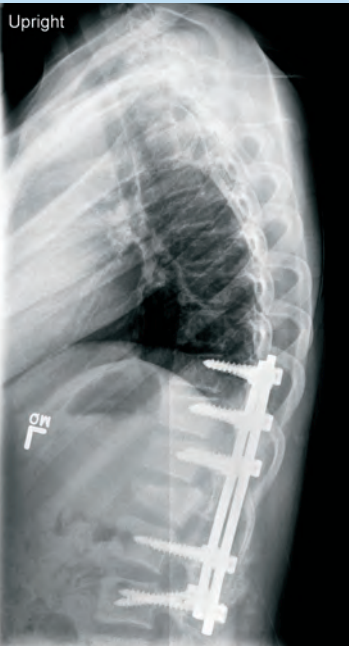
“Each day, they told her, ‘We’ve done our part. Now you have to take your recovery from here,’” said Lorna.

After 14 days at Le Bonheur, Kristyn underwent two weeks of intensive inpatient rehabilitation.

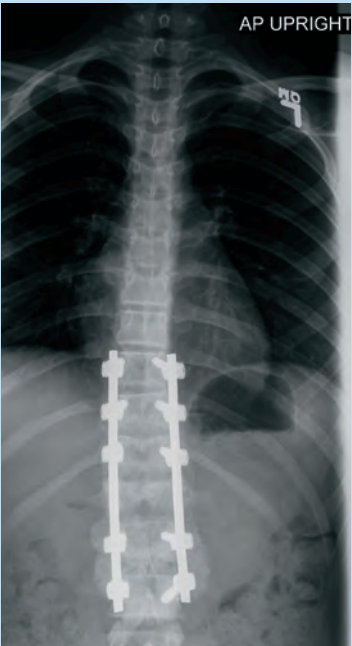
Today, just more than a year after her accident, Kristyn is walking again. She goes to physical therapy twice a week and still has some weakness in her right ankle. She hopes to go back to playing softball soon.



3D CT reconstruction of spine following L1 burst fracture



Post-operative lateral X-ray of the spine demonstrating restoration of normal sagittal alignment



Post-operative AP X-ray of the spine demonstrating posterior spinal fusion and instrumentation from T10 to L3

Research, Publications and Presentations

Le Bonheur Children's Hospital and Campbell Clinic's five surgeons are actively involved in research and presentations in the pediatric orthopaedic field. Highlights from their work are listed below:

Publications

The Use of Magnetic Resonance Imaging in the Evaluation of Spondylolysis. Rush JK, Astur N, Scott S, Kelly DM, Sawyer JR, Warner WC, Jr. J Pediatr Orthop. 2014 June 24. [Epub ahead of print]

Accessibility and Quality of Online Information for Pediatric Orthopaedic Surgery Fellowships. Davidson AR, Murphy RF, Spence DD, Kelly DM, Warner WC Jr, Sawyer JR. J Pediatr Orthop. 2014 May 19. [Epub ahead of print]

Traumatic Atlanto-occipital Dislocation in Children. Astur N, Sawyer JR, Kilmo P, Kelly DM, Muhlbauer M, Warner WC. J Am Acad Orthop Surg May 2014; 22:274-282; doi:10.5435/JAAOS-22-05-274

Altered lower extremity fracture characteristics in these pediatric trauma patients. Gilbert SR, Macdennan PA, Backstrom I, Creek A, Sawyer J. J Orthop Trauma. 2014 Apr 15. [Epub ahead of print]

Current State of Pediatric Orthopaedic Disaster Response. Kelly DM, Heyworth BE, Kruse RW, Edmonds EW, Vans, K, Poloszewa DA, Talwalkar VR, Warner WC Jr, Gordon JE. J Pediatr Orthop. 2014 Apr-May;34(3):231-9

Intra-observer and Inter-observer Reliability and the Role of Fracture Morphology in Classifying Femoral Shaft Fractures in Young Children. Thompson NB, Kelly DM, Warner WC Jr, Rush JK, Moisan A, Hanna WR, Beatty JH, Spence DD, Sawyer JR. J Pediatr Orthop. 2013 Oct 29. [Epub ahead of print]

Current State of Pediatric Orthopaedic Disaster Response. Pediatric Orthopaedic Society of North America and Prevention Committee 2011-2012. Kelly DM, Heyworth BE, Kruse RW, Edmonds EW, Vanderhave K, Poloszewa DA, Talwalkar VR, Warner WC Jr, Gordon JE. J Pediatr Orthop. 2013 Oct 29. [Epub ahead of print]

Characterization of Radiation Exposure in Early Onset Scoliosis Patients Treated With the Vertical Expandable Prosthetic Titanium Rib (VEPTR). Cannon TA, Astur N, Kelly DM, Warner WC Jr, Sawyer JR. J Pediatr Orthop. 2013 Oct 29. [Epub ahead of print]

Weight Gain During External Fixation. Calotta B, Gilbert SR, Sawyer JR, Rich A, Sellers T. Journal of Children's Orthopaedics, March 2013, Volume 7, Issue 2, pp 147-150

Painless Extremity Following an Apparently Non-displaced Proximal Humeral Physic Fracture: A Case Report. Hall JM, Sawyer JR, Warner WC Jr, Moisan A, Kelly DM. BJS Case Connector, 2013 Sep 11;3(3):e90-1-4

Medial Ulnar Collateral Ligament Injury in Children and Adolescents: An MRI Anatomic Study. Larsen N, Moisan A, Witte D, Elizey A, Sawyer JR, Warner WC Jr, Beatty JH, Kelly DM. J Pediatr Orthop. 2013 Sep 30;33(6):664-6

Treatment of Pediatric Femur Fractures with the Pavlik Harness: Multicenter Clinical and Radiographic Outcomes. Rush JK, Kelly DM, Sawyer JR, Beatty JH, Warner WC Jr. J Pediatr Orthop. 2013 Sep 30;33(6):614-7

Atypical presentation of an osteoid osteoma in a child revealed. Sawyer JR. Am J Orthop (Belie Mead NJ). J Pediatr Orthop. 2013 Jan;42(1):19

Associated injuries in children and adolescents with spinal trauma. Rush JK, Kelly DM, Astur N, Creek A, Dawkins R, Younas S, Warner WC Jr, Sawyer JR. J Pediatr Orthop. 2013 Jan;33(4):393-7; doi: 10.1097/BPO.0b013e3182b79c0b

An accessory limb with lipomyelomeningocele in a male. Murphy RF, Cohen BH, Muhlbauer MS, Eubanks JW 3rd, Sawyer JR, Moisan A, Kelly DM, Peadar Surg Int. 2013 Jul;29(7):749-52; doi: 10.1007/s00381-013-2669-9, Epub 2013 Feb 8

Great B, J. Neumann J. Warner WC. Sawyer J. R. Kelly D. M. Patient follow-up in pediatric orthopaedic retrospective call-back studies. J Orthopaedic Practice. 2013;590-594. November/December 2012

Warner WC, Astur N, Kilmo P, Muhlbauer M, S. Gabrick I. Occipitocervical fusion using a contoured rod and wire construct in children: a reappraisal of a vintage technique. J Neurosurg Pediatr. 2012 Nov 16. [Epub ahead of print]

Miller DJ, Kelly DM, Spence DD, Beatty JH, Warner WC Jr, Sawyer JR. Locked intramedullary nailing in the treatment of femoral shaft fractures in children younger than 12 years of age: indications and preliminary report of outcomes. Journal of Children's Orthopaedics. 2012 Dec28(8):777-80; doi: 10.1097/BPO.0b013e3182b6b0ba

Great B, Sawyer J.R., Warner WC Jr, Beatty JH, Kelly DM. Factors Affecting Research Subject Rate of Return in Pediatric Orthopaedic Retrospective Review Studies. J Orthopaedic Practice. 2013;590-594. Nov/Dec 2012; doi: 10.1097/BPO.0b013e3182b6b0ba

Spence DD, Shore B, Graham HK. The Role of Hip Surveillance in Children with Cerebral Palsy. Curr Musculoskeletal Med:5:126-134, 2012.

Sawyer JR, Beebe M, Creek A, Yantis M, Kelly DM, Warner WC. Age-related Patterns of Spine Injury in Children Involved in All-Terrain Vehicle Accidents. Journal of Pediatric Orthopaedics. 2012 Jul;32(5):435-9. PMID: 22704655

Backstrom I, C. Macdennan PA; Sawyer JR, Creek A, Rue L.W., Gilbert S.B. Pediatric obesity and traumatic lower-extremity long-bone fracture outcomes. J Trauma Acute Care Surg. 2012 Aug 17 [Epub ahead of print]

Norton B, Mulligan R, Rush JK, Kelly DM, Warner WC, Sawyer JR. Proximal femoral fractures in children and adolescents:an update. COP Volume 23 Number 5 September/October 2012 429-434

Brey JM, Conoley J, Canale ST, Beatty JH, Warner WC Jr, Kelly DM, Sawyer JR. Tibial tuberosity fractures in adolescents: is a posterior metaphyseal fracture component a predictor of complications? Journal of Pediatric Orthopaedics. 2012 Sep; 32(5):561-6. PubMed PMID: 22892616

Jaquith B, Creek A, Flinn P, Warner M, Sawyer J., Freeman B, Kelly D. Screws versus hooks: implant cost and deformity correction in adolescent idiopathic scoliosis. J Child Orthop. 2012;36(2):277-80

Journal of Children's Orthopaedics, Online First (TM). 23April2012 Andaker, Tola Warner, Sponsorless, Skaggs. Pediatric chance fractures: a multicenter perspective. Journal of Children's Orthopaedics. 2011 Oct-Nov;31(7):741-4. PMID: 21926870

Larson AN, Sucato DJ, Herring JA, Adolphs SE, Kelly DM, Martus JE, Lovejoy JF, Browne R, Delancio A. A Prospective Multicenter Study of Legg-Calve-Perthes Disease: Functional and Radiographic Outcomes of Nonoperative Treatment at Mean Follow-up of Twenty Years. J Bone Joint Surg Am. 2012 Apr 4;94(7):584-92

Sawyer JR, Beebe M, Creek AT, Yantis M, Kelly DM, Warner WC Jr. Age-related Patterns of Spine Injury in Children Involved in All-Terrain Vehicle Accidents. J Pediatr Orthop. 2012 Jul;32(5):435-9

Sawyer JR, Bernard MS, Schroeder RJ, Warner WC Jr, Kelly DM. (2011) Trends in all-terrain vehicle-related spinal injuries in children and adolescents. Journal of Pediatric Orthopaedics. 31(6):622-7

Rachel JN, Williams JB, Sawyer JR, Warner Jr WC, Kelly DM. (2011) Radiographic Evaluation Necessary in Children with a Clinical Diagnosis of Calneal Apophysis (Sever Disease)? Journal of Pediatric Orthopaedics. 31(5):548-50

Sawyer JR, Kelly DM, Kellum E, Warner WC Jr. (2011) Orthopaedic aspects of all-terrain vehiclerelated injury. Journal of the American Academy of Orthopaedic Surgeons. 19(4):219-25

Nawaf CB, Kelly DM, Warner WC, Beatty JH, Sawyer JR. (2011) Fat Embolism Syndrome in an Adolescent Before Surgical Treatment of an Isolated Closed Tibial Shaft Fracture. Accepted for publication – American Journal of Orthopaedics

Jaquith BP, Creek A, Flinn P, Sawyer JR, Warner WC Jr, Freeman BL, Kelly DM. (2011) Cost Comparison of Correction Obtained with Pedicle Screw and Hook Constructs in Adolescent Idiopathic Scoliosis. Submitted for publication – Journal of Children's Orthopaedics

Brey JM, Conoley J, Canale ST, Beatty JH, Warner WC Jr, Kelly DM, Sawyer JR. (2011) Tibial tuberosity fractures in adolescents: Is Salter-Harris Type II Posterior Fracture Component a Predictor of Complications? Submitted for publication – Journal of Pediatric Orthopaedics

Miller J, Kelly DM, Spence DD, Beatty JH, Warner WC Jr, Sawyer JR. (2011) Locked Intramedullary Nailing in the Treatment of Femoral Shaft Fractures in Children Younger than Twelve Years of Age: Indications and Preliminary Report of Outcomes. Submitted for publication – Journal of Pediatric Orthopaedics

Warner JC, MS, Sawyer JR. Kyphosis in Lowell and Winter's Pediatric Orthopaedics 7th Edition. Submitted for Publication

Rachel JN, Williams JB, Sawyer JR, Warner Jr WC, Kelly DM. (2011) Radiographic Evaluation Necessary in Children with a Clinical Diagnosis of Calneal Apophysis (Sever Disease)? Journal of Pediatric Orthopaedics. 31(5):548-50

Sawyer JR, Kelly DM, Beatty JH, Warner WC Jr, Canale ST (2011) Kidstand Technique to Promote Elevation and Wound Care in Pediatric Lower Extremity Injuries. American Academy of Orthopaedic Surgeons. San Francisco, Calif, February 2012

Sawyer JR, Kelly DM, Warner WC Jr, Canale ST, Brey, Jennifer, Conoley J (February 2012): Salter Harris I Fractures of the Posterior Tibia Associated with Tibial Tuberosity Fractures: A Marker for Potentially Serious Complications. American Academy of Orthopaedic Surgeons, San Francisco, Calif, February 2012

Sawyer JR, Kelly DM, Warner J, WC, Cannon, AS. Characterization of Radiation Exposure in Early Onset Scoliosis Patients Treated with the Vertical Expandable Prosthetic Titanium Rib (VEPTR). Scoliosis Research Society. Chicago, Ill., March 2013

Sawyer JR, Kelly DM, Warner J, WC, Guevara BG, Thompson NB (2011) High Prevalence of Associated Injuries in Children with Spinal Fractures. American Academy of Orthopaedic Surgeons

Sawyer JR, Beatty JH (2011) Staying Out of Trouble in Pediatric Orthopaedics. American Academy of Orthopaedic Surgeons

Sawyer JR, Kelly DM, Warner J, WC, Beatty JH, Canale ST (2011) The Kidstand Technique to Promote Elevation and Wound Care in Pediatric Lower Extremity Injuries. American Academy of Orthopaedic Surgeons

Sawyer JR, Guevara B, Thompson N, Dawkins R, Kelly DM, Warner J, WC (2011) High Prevalence of Associated Injuries in Children with Spinal Fractures. American Academy of Orthopaedic Surgeons

Sawyer JR, Beebe M, Thompson N, Creek A, Kelly DM, Warner J, WC, Beatty JH (2011) Age-Related Patterns of Spine Injuries Following ATV Accidents in Children. American Academy of Orthopaedic Surgeons

Sawyer JR, Warner J, WC, Kelly DM, Rachel JN, Williams JB (2011) Radiographic Evaluation Necessary in Children with a Clinical Diagnosis of Calneal Apophysis (Sever Disease)? Journal of Pediatric Orthopaedics

Sawyer JR, Kelly DM, Warner J, WC, Beatty JH, Canale ST (2011) Radiographic Evaluation Necessary in Children with a Clinical Diagnosis of Calneal Apophysis (Sever Disease)? Journal of Pediatric Orthopaedics

Sawyer JR, Kelly DM, Warner J, WC, Beatty JH, Canale ST (2011) Radiographic Evaluation Necessary in Children with a Clinical Diagnosis of Calneal Apophysis (Sever Disease)? Journal of Pediatric Orthopaedics

Sawyer JR, Kelly DM, Warner J, WC, Beatty JH, Canale ST (2011) Radiographic Evaluation Necessary in Children with a Clinical Diagnosis of Calneal Apophysis (Sever Disease)? Journal of Pediatric Orthopaedics

Sawyer JR, Kelly DM, Warner J, WC, Beatty JH, Canale ST (2011) Radiographic Evaluation Necessary in Children with a Clinical Diagnosis of Calneal Apophysis (Sever Disease)? Journal of Pediatric Orthopaedics

Sawyer JR, Kelly DM, Warner J, WC, Beatty JH, Canale ST (2011) Radiographic Evaluation Necessary in Children with a Clinical Diagnosis of Calneal Apophysis (Sever Disease)? Journal of Pediatric Orthopaedics

Sawyer JR, Kelly DM, Warner J, WC, Beatty JH, Canale ST (2011) Radiographic Evaluation Necessary in Children with a Clinical Diagnosis of Calneal Apophysis (Sever Disease)? Journal of Pediatric Orthopaedics

Sawyer JR, Kelly DM, Warner J, WC, Beatty JH, Canale ST (2011) Radiographic Evaluation Necessary in Children with a Clinical Diagnosis of Calneal Apophysis (Sever Disease)? Journal of Pediatric Orthopaedics

Presentations

Jim Beatty, MD

Beatty J, Bert, Biggers, Moisan, Sawyer, Warner, Kelly, Fracture of the Medial Humeral Epicondyle in Children: A Comparison of Operative and Nonoperative Management (accepted Podium). American Academy of Orthopaedic Surgeons, New Orleans, March 2014

Beatty, Thompson, Kelly, Rush, Warner, Spence, Moisan, Sawyer. Intra and Inter-Observer Reliability and the Role of Fracture Morphology in Classifying Femoral Shaft Fractures in Children (poster). European Pediatric Orthopaedic Society, Belgium, April 2014

Beatty, Warner H. MD, Ryan Murphy BS, Derek M. Kelly MD, William C. Warner Jr. MD, Moisan RN, Norfleeth Thompson NB, David D. Spence MD, Jeffrey R. Sawyer MD. Transverse Femoral Shaft Fractures are a Better Predictor of Non-Accidental Trauma than Spinal Fractures in Young Children (poster). European Pediatric Orthopaedic Society, Belgium, April 2014

Beatty James H. MD, Byron F. Stephens MD, Jeffrey R. Sawyer MD, William C. Warner MD, David D. Spence MD, Alice A. Moisan BSN, David D. Spence MD, Kelly M. Kelly MD. Interleukin-6 in Pediatric Musculoskeletal Infection: A Pilot Study (podium). European Pediatric Orthopaedic Society, Belgium, April 2014

Beatty James H. MD, Ryan Murphy BS, Derek M. Kelly MD, William C. Warner Jr. MD, Moisan RN, Norfleeth Thompson NB, David D. Spence MD, Jeffrey R. Sawyer MD. Transverse Femoral Shaft Fractures are a Better Predictor of Non-Accidental Trauma than Spinal Fractures in Young Children (accepted podium). POSNA, Hollywood, Ca., April-May 2014

Beatty James H. MD, Byron F. Stephens MD, Jeffrey R. Sawyer MD, William C. Warner MD, David D. Spence MD, Alice A. Moisan BSN, David D. Spence MD, Kelly M. Kelly MD. Interleukin-6 in Pediatric Musculoskeletal Infection: A Pilot Study (accepted e poster). POSNA, Hollywood, Ca., April-May 2014

Beatty J. Advocacy for Orthopaedic Surgeons. IPPOS. December 4-7, 2013. Lake Buena Vista, Fla.

Beatty J. Case Presentations. IPPOS. December 4-7, Lake Buena Vista, Fla.

Beatty J. Slipped capital femoral epiphysis: Update. Pediatric Orthopaedic Society. Common Conditions and the Pediatric Hip. Le Bonheur, November 2, 2013.

Beatty J. Frequently missed upper extremity fractures. Pediatric Orthopaedic Society: Common Conditions and the Pediatric Hip. Le Bonheur, November 2, 2013.

Beatty J. Sports Injuries in Children and Adolescents: 2013 Update. Etteldorf Symposium 2013. Le Bonheur, May 2013.

Beatty J. The Orthopaedic Lecture: Basics. AAOS Annual Meeting, Chicago, Ill. March 2013.

Beatty J. The Orthopaedic Lecture: Effective Delivery. AAOS Annual Meeting, Chicago, Ill. March 2013.

Beatty J. Developing Leadership Through Orthopaedic Organizations. AAOS Annual Meeting, Chicago, Ill. March 2013.

Beatty J. The Kids You See on Call: Slipped Capital Femoral Epiphysis. AAOS Annual Meeting, Chicago, Ill. March 2013.

Beatty J. Child Abuse: Nonaccidental Injury. AAOS Annual Meeting, Chicago, Ill. March 2013.

Beatty J. Management of the Multiply Injured Child. AAOS Annual Meeting, Chicago, Ill. March 2013.

Beatty J.H., Warner W.C., Sawyer J.R., Kelly D.M., Larsen, Moisan, Witte, Elzey. Medial Ulmar Collateral Ligament Origin on the Medial Epicondylar Apophysis in the Skeletally Immature Elbow: An MRI Anatomical Study. Presented at the American Academy of Orthopaedic Surgeons, Chicago, Ill., March 2013.

Beatty J.H., Warner W.C., Sawyer J.R., Kelly D.M., Larsen, Moisan, Witte, Elzey. Medial Ulmar Collateral Ligament Origin on the Medial Epicondylar Apophysis in the Skeletally Immature Elbow: An MRI Anatomical Study. Poster presented at POSNA annual meeting, Toronto, Ontario, May 2013.

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J.S., d'Amato, C.R., Moisan, A., Kelly, D.M., Sawyer, J.R. The Efficacy of Rib-Based Distraction with VEPTR in Treatment of Early Onset Scoliosis