Division of Orthopaedics

DIVISION PROFILE	
Number of Faculty	9
Number of Joint Appointment Faculty	5
Number of Fellows	
Clinical Fellows	2
Research Fellows	1
Number of Other Students (full and part-time)	7
Number of Support Personnel	30
Number of Peer Reviewed Publications	11
Patient Encounters	
Outpatient	30,481
Inpatient	1,564

FACULTY LISTING

Eric Wall, MD, Associate Professor, Director, Pediatric Orthopaedic Surgery; Director, Orthopaedic Sports Medicine.
Alvin Crawford, MD, Professor of Orthopaedic Surgery, Director, Spine Center and Fellowship Program
Twee Do, MD, FAAP, Assistant Professor, Director, Neuromuscular Services
A. Atiq Durrani, MD, Assistant Professor, Co-Director of Spine Center and Director of Developmental Biology Research Lab
Charles Mehlman, DO, MPH, Associate Professor, Director, Musculoskeletal Outcomes Research, Pediatric Orthopaedic Resident Education, Brachial Plexus and Co-Director of the Limb Reconstruction Center
Junichi Tamai, MD, Assistant Professor
Diane Von Stein, MD, Assistant Professor, Co-Director of Limb Reconstruction Center
Donita Bylski-Austrow, PhD, Assistant Professor
Aaron Pearlman, MD, Emeritus

FACULTY JOINT APPOINTMENT LISTING

Thomas Kiefhaber, MD, Hand Surgery Center
Andrew Markiewitz, MD, Hand Surgery Center
James Willis, MD, Hand Surgery
Craig Willis, MD, Hand Surgery
Mohab Foad, MD, Assistant Professor, Orthopaedics

OVERVIEW

The Division of Orthopaedics' primary focus is the management of congenital and acquired musculoskeletal problems in children.

The spine research program has focused on understanding the anatomy, biomechanics and biology of the spine and how this may be used to improve the clinical practice of spine surgery. Dr. Crawford is part of a multi-center spine research group, the HARMS group. They are dedicated to studying the different treatment options for spine surgery and their outcomes. Development of innovative treatment methods, the mechanobiology of growth, the biomechanical function of spine ligaments, and biomechanics of instrumentation insertion have been recently investigated.

Left to Right: T. Do, A. Crawford, A. Durrani, J. Tamai, E. Wall, C. Mehlman, D. Von Stein

New collaborative basic science research program between the Division of Orthopaedic Surgery and the Department of Developmental Biology on the "Regulation of Skeletal Growth Plate" has been started at CCHMC. This program is designed to study the physiological physical growth and subsequently study the patterns of abnormal skeletal growth as a result of breaks in this regulation pathway.

We have designed and fabricated a spine staple based on the premise that some scoliosis may be surgically arrested or corrected much less invasively by modifying spine growth. The initial work was published in Spine (May 20, 2005). A joint company, SpineForm LLC, was created to develop and test the staple. Patents have been issued in Australia, South Korea, and the USA; and are pending in Europe and Japan. With the help of a CCHMC Trustee Grant, we began in vivo studies to define the pressure levels that arrest spine growth. A grant was submitted to the Scoliosis Research Society, and an award was granted to develop and test novel micro-electro-mechanical (MEMS) stress sensors. We are also quantifying structural features of spine growth plate tissues from scoliosis patients. With these tissues, we have determined that growth activity remains in the spine even in patients with severe deformities.

Congenital and traumatic orthopaedic problems of the lower limbs are emerging as biomechanical research themes. Comparisons in strength and stiffness of different fracture fixation techniques have been the subject of three experiments. Limb length discrepancy is another area of emerging interest. Dr. Diane Von Stein has begun development of an in vivo animal model and assessment methods to test the potential of improvements in distraction osteogenesis techniques.

The CCHMC Brachial Plexus Center has been in operation for four years. Our center brings together a team of specialists from Plastic Surgery, Hand Surgery, Pediatric Orthopaedics, Pediatric Rehabilitation, and Occupational Therapy. The center's multi-disciplinary team offers evaluation and treatment of children with brachial plexus injuries in one comprehensive program. In the past four years we have cared for 257 patients with 710 patient visits. We have three half day clinics per month.

HIGHLIGHTS

Clinical Highlights

Since its inception three years ago, the Brachial Plexus Center has shown growth and success as a patient and family friendly center that delivers the highest quality evidence-based care to our patients. The increase in patient referral has resulted in the need for increased clinical services.

Limb Reconstruction Center Limb-lengthening services were expanded in Fiscal 2005 with the addition of Diane Von Stein, MD.

The Spine Center is a multi-disciplinary team of experts who collaborate in the evaluation, diagnosis and treatment of pediatric spinal disorders. The center also participates in national and international research in an effort to provide the best care for children worldwide, as well as provides educational seminars and community-based lectures. Over the past year we have treated very young children with severe curvatures with the VEPTR (Vertical Expandable Prosthetic Titanium Rib) Procedure for thoracic insufficiency syndrome, young children with progressive deformities by "growing rods"; to young adults with late onset idiopathic scoliosis. The Frontier Implant developed in cooperation with San Diego Children's, Philadelphia Shriner's and Temple University is utilized world-wide. A spine fellow will be joining the center in 2006.

The Musculoskeletal Oncology Center is the only multi-disciplinary center dealing with bone and soft tissue tumors in the entire region. We have already seen an increase in patient referrals to the center and as the center becomes more established, the business will continue to improve.

Research and Teaching Highlights

Brian Grauwe: Brian is a medical student working with Dr. Toan Le on mechanics of locking versus non-locking screws in fracture fixation.

Jonathon Henkel: A Case Western Reserve, BME, CCRF Summer Undergraduate Research student continues studies on needle parameters and began testing biomechanics of needle insertion forces toward development of a painless injection system.

Soo Kim: Medical student working with Dr. Junichi Tamai. She conducted a retrospective review of patients with hyper-kyphosis treated with the "Four-Sixes" non-operative method.

William Lippert: Third year Biology student at Kenyon College. He has been working with Dr. Eric Wall on the progression of his painless injection device by completing an optimal intramuscular needle penetration depth study.

Nicole McDonald, BSE: Third year medical student at the University of Cincinnati. Project was in the area of fracture fixation biomechanics: bending and torsional strength of intramedullary nails in the femur: differences in retrograde versus antegrade surgical approach. The work was accepted for presentation at the Orthopaedic Trauma Association.

Andrea Montgomery: Women in Science and Engineering (WISE) program at the University of Cincinnati. She expanded the growth plate structural measurements. She has also been defining methods of labeling growth plates for the next in vivo spine mechanobiology experiments, and researching possible methods of classifying the viability of intervertebral disc cells.

Lucas B. Richie: Second Year medical student at University of Cincinnati. Lucas is writing a comprehensive review article on neonatal brachial plexus palsy. He plans to finish this article in September 2005 and submit to the Pediatrics.

Frank Sauser: UC ECE: Frank presented his study of fabrication and testing of sub-miniature pressure transducers in Vienna Austria in Oct. 04, at the IEEE Medicine and Biology Conference. The first sensors were implanted in vivo to determine pressures on the growth plate of the spine in April 05. The work was also accepted for presentation at the 2005 International Society of Biomechanics meeting.

David Sheyn: UC BME: Connections E, UC Physician Scientist Training Program. David was nominated by UC Biomedical Engineering Department for the Herman Schneider Award for exemplary co-operative education student. David's work on quantifying changes to vertebral growth plates after spine stapling was presented at the Orthopaedic Research Society in February 2005, Washington DC, and the 2005 Scoliosis Research Society.

Ahilan Sivaganesan: Summer Undergraduate Research Program (SURF). Ahilan conducted statistical analyses of spine anthropometry and growth plate measurements.

Jason Vourazeris: Second year medical student at the University of Cincinnati, conducted a retrospective study of Juvenile OCD patients. The goal of the study is to determine which factors on MRI and X-ray help predict the healing potential of stable lesions. In order to complete the study Jason reviewed and documented over 150 patient medical records, evaluated more than 100 MRIs, and created a database containing treatment history and multiple measurements.

Eric Mahaney, BA and Chitra Dahia, PhD are currently working on a mouse model system to understand the molecular mechanism of vertebral growth and its defects in diseases like scoliosis.

TRAINING

Safet Hatic, DO	PGY-I	Grandview
Micah Hobbs, DO	PGY-I	Grandview
Timoth Histerman, DO	PGY-I	Grandview
Kevin Little, MD	PGY-II	University of Cincinnati College of Medicine, Cincinnati, OH
Mike Greiwe, MD	PGY-II	University of Cincinnati College of Medicine, Cincinnati, OH
Taruna Madhav, MD	PGY-II	University of Cincinnati College of Medicine Cincinnati, OH
Rich Owens, MD	PGY-II	University of Cincinnati College of Medicine, Cincinnati, OH
Ian Brimhall, DO	PGY-III	Bi-County, Warren, MI
Jason Dieterle, DO	PGY-III	Bi-County, Warren, MI
Brian Levings, DO	PGY-III	St. Anthony Hospital, Oklahoma City, OK
Julie Chevillet, DO	PGY-III	Doctor's Hospital, Columbus, OH
Michael Wind, MD	PGY-IV	University of Cincinnati College of Medicine, Cincinnati, OH
Steven Agabegi, MD	PGY-IV	University of Cincinnati College of Medicine, Cincinnati, OH
Kris Parchuri, DO	PGY-IV	Tulsa Regional Medical Center, Tulsa, OK
Barton Branam	PGY-IV	University of Cincinnati College of Medicine Cincinnati, OH
Matt Weichbrodt, DO	PGY-IV	Tulsa Regional Medical Center, Tulsa, OK
Sameh Arebi, MD	PGY-IV	University of Cincinnati College of Medicine, Cincinnati, OH
William Truluck, DO	PGY-IV	Ingham Regional Medical Center, Lansing, MI
Donnie M. Reinhart, DO	Fellow	Kettering/Grandview Medical Center
Venkatachalapathy Perumal, MBBS, MS	Fellow	Stanley Medical College and Hospital, India
Viral Jain, MBBS, MS	Fellow	Smt. N.H.L. Municipal Medical College, Sheth V.S. General Hospital, India

PUBLICATIONS

1. Crawford AH. Anterior surgery in the thoracic and lumbar spine: endoscopic techniques in children. Instr Course Lect 2005;54:567-76.

1. Crawford AH, Al-Sayyad MJ. Miscellaneous conditions of the cervical spine: neurofibromatosis, juvenile rheumatoid arthritis, and rickets. In: Clark CR, Benzel EC, Cervical Spine Research Society. Editorial Committee, editors. The cervical spine 4th ed. Philadelphia: Lippincott Williams & Wilkins; 2005. p. 481-507.
2. Herrera-Soto JA, Parikh SN, Al-Sayyad MJ, Crawford AH. Experience with combined video-assisted thoracoscopic surgery (VATS) anterior spinal release and posterior spinal fusion in Scheuermann's kyphosis. Spine 2005;30(19):2176-81.
3. Herring JA, Crawford AH. Staying out of trouble with the hip: Legg-Calve-Perthes, slipped capital femoral epiphysis, and transient synovitis vs. septic arthritis. Consulting guru. In: Skaggs DL, Flynn JM, editors. Staying out of trouble in pediatric orthopaedics. Philadelphia: Lippincott Williams and Wilkins; 2006. p. 308-325.
4. Newton PO, Betz R, Clements D, Crawford AH. Frontier instrumentation. In: Kim DH, Vaccaro AR, Fessler RG, editors. Spinal instrumentation : surgical techniques. New York: Thieme; 2005. p. 424-431.
5. Do TT. Congenital muscular torticollis: current concepts and review of treatment. Curr Opin Pediatr 2006;18(1):26-9.
6. Mehlman CT, Wall EJ. Injuries to the shafts of the radius and ulna. In: Rockwood CA, Wilkins KE, Beaty JH, Kasser JR, editors. Rockwood and Wilkins' fractures in children 6th ed. Philadelphia: Lippincott Williams & Wilkins; 2006. p. 399-441.
7. VanderBeek BL, Mehlman CT, Foad SL, Wall EJ, Crawford AH. The use of conscious sedation for pain control during forearm fracture reduction in children: does race matter? J Pediatr Orthop 2006;26(1):53-7.
8. Trapp CM, Tamai J, Schleiss MR. Septic arthritis secondary to fusobacterium necrophorum in a 4-year-old girl: case report and review of the literature. Pediatr Infect Dis J 2005;24(9):846-7.
9. Laor T, Wall EJ, Vu LP. Physeal widening in the knee due to stress injury in child athletes. AJR Am J Roentgenol 2006;186(5):1260-4.
10. Salinsky JP, Parikh SN, Wall EJ. Shoehorn technique for reduction of distal radius fracture: a technical note. Am J Orthop 2005;34(12):583-5.
11.