

Division Photo



Front row (seated): J. McCarthy, E. Wall; Middle row: C. Dahia, A. Nikolaou, M. Foad, V. Jain, S. Agabegi; Back row: J. Sorger, R. Cornwall, C. Mehlman, A. Crawford, S. Parikh, J. Tamai, D. Bylski-Austrow

Division Data Summary

Research and Training Details

Number of Faculty	12
Number of Research Fellows	2
Number of Research Students	2
Number of Support Personnel	29
Direct Annual Grant Support	\$7,000
Peer Reviewed Publications	18

Clinical Activities and Training

Number of Clinical Staff	7
Number of Clinical Fellows	4
Number of Clinical Students	14
Number of Other Students	10
Inpatient Encounters	570
Outpatient Encounters	37,323

Significant Publications

Okike K, Kocher MS, Wei EX, Mehlman CT, Bhandari M. Accuracy of conflict-of-interest disclosures reported by physicians. N Eng J Med 2009 Oct 8;361(15):1466-74.

Highlights discrepancy between actual conflict of interest and reported conflict of interest among Orthopaedic Surgeons.

Kocher MS, Sink EL, Blasier RD, Luhmann SJ, Mehlman CT, Scher, DM, Matheney T, Sanders JO, Watters WC, 3rd, Goldberg MJ, Ketih MW, Haralson RH, 3rd, Turkerlson CM, Wies JL, Sluka P, Hitchcock K.

Treatment of Pediatric Diaphyseal Femur Fractures. J Am Acad Orthop Surg 2009 Nov;17 (11):718-25.

First pediatric orthopaedic clinical practice guideline for the treatment of pediatric femur fractures

Elefteriou F, Kolanczyk M, Schindeler A, Viskochil DH, Hock JM, Schorry EK, Crawford AH, Friedman JM, Little D, Peltonen J, Carey JC, Feldman D, Yu X, Armstrong L, Birch, P, Kendler DL, Mundlos S, Yang FC, Agiostratidou G, Hunter-Schaedle K, Stevenson DA. Skeletal Abnormalities in Neurofibromatosis Type 1: Approaches to Therapeutic Options. Am J Med Genet A2009 Oct;149A(10):2327-38.

Multi-center collaborative report on skeletal abnormalities in Neurofibromatosis.

Division Highlights

Donita Bylski-Austrow, PhD, Eric J. Wall, MD, Shital Parikh, MD, and Kevin Little, MD

Juvenile Osteochondritis Dissecans: Model of etiology: Growth plate injuries are often caused by the over-loading of young joints during athletic and other activities. A rabbit model of knee joint overuse has been developed in order to define injury mechanisms and quantify overload criteria. The model will allow us to determine a range of factors that lead to overuse injuries, define biological changes that result from chronic overuse of children's knees, and test potential improvements in treatments for these common and difficult pediatric skeletal injuries. This study is performed in collaboration with Keith Stringer, MD (Pathology), and Tal Laor, MD (Radiology).

Donita Bylski-Austrow, PhD, Alvin C. Crawford MD, Viral J. Jain MD, and Eric Wall, MD

Spine deformity: Model of early treatment: Mechanically slowing or even stopping the progression of spine deformities such as juvenile and adolescent idiopathic scoliosis has been a goal in pediatric orthopaedics for more than half a century. Achievement of this goal would eliminate the need for children to later undergo a large and difficult surgery. The Division of Pediatric Orthopaedic Surgery was the first to invent an implant and minimally invasive procedures that were shown to alter spine growth. Our study of the changes to the spine at the tissue and cell levels have helped explain how the implant works, that it induces structural gradients in the vertebral growth plates. We are currently defining several aspects of the physiological biomechanical conditions that the implant imposes on the intervertebral disc immediately post-operatively. This will explain how this implant functions, help to determine the likelihood of any side effects on the disc, and guide possible changes to the design of the implant. In collaboration with UC Mechanical Engineering, computational modeling of the spine has been initiated in order to give us the future capacity to simulate the effects of design changes on the biomechanical conditions exerted on the disc and vertebral growth plate, with the goal of decreasing the need for some preclinical tests. A second generation implant was recently approved by the FDA for a safety trial. Notably, this was the first orthopaedic device approved by the FDA for a specifically pediatric indication. Therefore, the studies we designed and executed may well help determine the regulatory pathway for other pediatric devices. Most recently, the joint company formed by CCHMC with a local medical device development venture that licensed the implant was awarded the funding to conduct the initial clinical trial via the Ohio Third Frontier's Biomedical Program. This study is performed in collaboration with Joe Reynolds, MBA, SpineForm LLC; George Thompson, MD, Jochen Son-Hing, MD, Case Western Reserve

Roger Cornwall, MD and Athanasia Nikolaou, PhD

Novel mouse model of neonatal brachial plexus injury. The pathophysiology of secondary musculoskeletal deformities following neonatal brachial plexus injury is poorly understood. We have created a surgical model of brachial plexus injury in neonatal mice that allows us to examine the effects of neonatal nerve injury on post-natal growth and development of muscles and joints. The model allows investigation of novel therapies for secondary musculoskeletal complications of nerve injury, including stem cell therapies and pharmacological preservation of muscle function. The research is being performed under the guidance of Roger Cornwall MD in collaboration with Christopher Wylie, PhD of Developmental Biology.

Alvin H. Crawford, MD

Harms Study Group (HSG): The Spine Center at CCHMC is one of 22 national and international centers currently participating in the Harms Study Group (HSG). The HSG is a group of 31 surgeons dedicated to the advancement of treatment for children and adolescents with spine deformity. The HSG conducts comprehensive, multi-center prospective and retrospective research studies aimed at answering important clinical questions regarding treatment approach and techniques. The study group is named for Dr. Juergen Harms, Professor of Orthopaedics at the University of Saarland, Homburg/Saar in Germany. Support is provided in part by an educational grant from DePuy Spine, Inc., a Johnson & Johnson Company.

Viral Jain, MD, Eric Wall, MD, and Alvin H. Crawford, MD

Growing Spine Study Group (GSSG): The Spine Center at CCHMC is also a member of the Growing Spine Study Group (GSSG) dedicated to the treatment of progressive early onset spinal deformities. The significance of this multi-center study is to obtain a large number of patient data to compare all treatments for children with this severe, challenging problem. This multi-center study will evaluate the long-term clinical and radiographic outcomes of EOS and other Early Onset Spinal and Chest Wall Deformities in a large population of patients.

Chitra Dahia, PhD, Viral Jain, MD, Eric Wall, MD

Molecular Mechanism of Intervertebral Disc Growth: The molecular mechanism of postnatal intervertebral disc growth, differentiation, and degeneration is poorly understood. This study proposes to delineate the molecular events that are controlled by major cell signaling pathways like sonic hedgehog (Shh), BMP, FGF and Wnt for disc growth and maintenance. We have developed an *in vitro* culture system where small molecule inhibitors or antagonists of the major cell signaling pathways can be employed to determine the effects of loss-of-function of these signaling pathways on normal disc growth. To understand the role of Shh, cyclopamine was employed to inhibit its signaling in the neonatal disc. This study shows that Shh is important for proliferation and survival of nucleus pulposus cells. Shh is also important

for the maintenance of matrix synthesis by the annulus fibrosis and end plate cells. The long-term goal of this study is to provide the basis for future research toward understanding the etiology and progression of disc degeneration. Such studies are crucial for designing effective therapies that treat the underlying pathogenesis of disc disease. This study is performed in collaboration with Christopher Wylie, PhD, from Developmental Biology.

Charles T. Mehlman, DO, MPH

Bracing In Adolescent Idiopathic Scoliosis Trial (BrAIST). The purpose of this study is to establish the effectiveness of thoracolumbar orthoses (TLSOs) in the treatment of Adolescent Idiopathic Scoliosis (AIS), using a multi-center, prospective, partially-randomized, controlled design. CCHMC has consistently been within the top five centers for recruitment and enrollment, and we rank third, nationally.

Shital Parikh, MD

Tibial Spine Fractures. In collaboration with Walter Samora, MD. This is a retrospective chart review that hopes to identify at-risk populations for tibial spine fractures. Goals of the study are to evaluate demographic data and identify risk factors associated with tibial spine avulsion fractures using radiographs and MRI, and to compare the tibial spine group to age/race matched patients with ACL tears and another group with normal radiographs of the knee.

Shital Parikh, MD

Pin Tract Infections. This study is a retrospective chart review of patients who had a supracondylar humerus fracture. This study will report on pin tract infection rates, and also patient outcomes following infection. If a trend can be identified, we hope to be able to prevent some infections from occurring.

Division Collaboration

Collaboration with Orthopaedic Surgery; Developmental Biology

Collaborating Faculty: Roger Cornwall, MD; Christopher Wylie, PhD

Creation of Mouse Model of Neonatal Brachial Plexus Injury: To identify effects on postnatal muscle stem cell function and muscle growth.

Collaboration with Orthopaedic Surgery; Anesthesia; Physical Medicine and Rehabilitation; Neurosurgery; Pulmonary Medicine

Collaborating Faculty: Alvin Crawford, MD; John McAuliffe, MD ; Alex Szabova, MD; Douglas Kinnett, MD; Francesco Mangano, MD; Gary McPhail, MD

The Spine Center: A multi-disciplinary team approach to spine care providing a broad spectrum of treatment options for pediatric spinal disorders.

Collaboration with Orthopaedic Surgery; Human Genetics

Collaborating Faculty: Alvin Crawford, MD; Elizabeth Schorry, MD

NF1 Bone Abnormalities Consortium: The Children's Tumor Foundation convened an International NF 1 Bone Abnormalities Consortium to address future directions for clinical trials in skeletal abnormalities associated with NF1. This project evaluates skeletal manifestations and available preclinical mouse models that will help advance toward optimal clinical management of NF 1 skeletal abnormalities, and major difficulties encountered for the design of clinical trials focused on the prevention and treatment of NF 1 skeletal abnormalities.

Collaboration with Orthopaedic Surgery; Human Genetics

Collaborating Faculty: Alvin Crawford, MD; Elizabeth Schorry, MD

Spinal abnormalities in Neurofibromatosis Type 1:

This NIH study is based out of the University of Utah to evaluate the onset of dysplastic scoliosis in patients with Neurofibromatosis. The purpose of this study is to determine the incidence and clinical history of NF1-related spinal abnormalities over a four-year period to determine the efficacy of various radiographic screening tools. (National P.I. – David H. Viskochil, MD, PHD, Div. of Medical Genetics, University of Utah. NIH R01 NS050509-01A1)

Collaboration with Orthopaedic Surgery; Human Genetics

Collaborating Faculty: Alvin Crawford, MD; Viral Jain, MD; Elizabeth Schorry, MD

Phase II trial of recombinant human known morphogenetic protein-2 (rhBMP-2) in surgical management of tibial pseudarthrosis in NF1: To conduct a phase II clinical trial using Bone Morphogenetic Protein-2 at time of first or second surgery for tibial pseudarthrosis in patients with NF1. Integrity of bone union and time to bone union will be compared to historical controls treated with surgery and autogenous bone graft only. This collaboration is conducted under a subcontract from the University of Alabama-Birmingham.

Collaboration with Orthopaedic Surgery; Developmental Biology

Collaborating Faculty: Chitra Dahia, PhD; Christopher Wylie, PhD

Intervertebral Disc Projects: Role of nucleus pulposus cells in the regulation of annulus fibrosis and endplate cells during growth and aging in a mouse model, effect of removal of nucleus pulposus cells on the annulus fibrosis and endplate cells in the intervertebral disc, use of transgenic mouse model system to study the role of specific signaling molecule secreted by the nucleus pulposus cells, use of agonists and antagonists in restoration of intervertebral disc.

Collaboration with Orthopaedic Surgery; Rotating Residents; Summer Musculoskeletal Outcomes Research Fellowship

Collaborating Faculty: Steven R. Gammon, MD; Winston M. Chan, BS; Charles T. Mehlman, DO, MPH

A Comparison of TLSO and SpineCor Treatment of Adolescent Idiopathic Scoliosis Patients Using the SRS Standardized Criteria: The St. Justine orthosis is a new bracing system that utilizes dynamic bracing in the treatment of adolescent idiopathic scoliosis (AIS). The purpose of this study was to compare treatment outcomes of AIS patients treated via a conventional TLSO approach or a St. Justine orthosis.

Collaboration with Orthopaedic Surgery; Summer Musculoskeletal Outcomes Research Fellowship; Center for Clinical and Translational Science and Training

Collaborating Faculty: Eric N. Bowman, MPH; Charles T. Mehlman, DO, MPH; Christopher J. Lindsell, PhD

Failure in Non-Operative Treatment for Pediatric Both-Bone Forearm Shaft Fractures: Forearm shaft fractures are the third most common fracture in children. Although closed reduction with casting is the preferred treatment, outcomes remain variable. The purpose of this study was to identify factors associated with failure of non-operative treatment for pediatric complete forearm shaft fractures, and explore the time-frame in which failure is likely.

Radiographs of patients who sustained pediatric both-bone forearm shaft fractures were retrospectively reviewed.

Collaboration with Orthopaedic Surgery; University of Cincinnati, College of Medicine, Department of Orthopaedic Surgery

Collaborating Faculty: Charles T. Mehlman, DO, MPH; Keith Kenter, MD; Peter J. Stern, MD; Cassie L. Kirby, BA, CCRP

Effect of the 80-Hour Rule on the Orthopaedic In-Training Exam (OITE): The purpose of this research study is to determine (retrospectively) the impact of the 80 hour rule on Orthopaedic In-Training Examination (OITE) test scores. In response to a variety of factors, the American Council on Graduate Medical Education (ACGME) mandated restrictions on resident duty hours in July 2003. Specifically, these guidelines limited residents to 80 hours of work per week, no new patient contact after 24 hours, no single shift lasting more than 30 hours, and one in every seven days must be free of clinical duties (ACGME: Common Program Hours).

Collaboration with Orthopaedic Surgery; University of Cincinnati, College of Medicine, Institute for the Study of Health

Collaborating Faculty: Charles T. Mehlman, DO, MPH; Jun Ying, PhD; Cassie L. Kirby, BA, CCRP

Hospital Costs Associated with the Surgical Treatment of Adolescent Idiopathic Scoliosis: Posterior spinal fusion (PSF) is the most common surgical treatment for AIS. The purpose of this study was to analyze the hospital costs associated with PSF treatment for AIS and to assess potential regional differences (Northeast, Midwest, South, and West) using a large national (USA) database. The Healthcare Cost and Utilization Project (HCUP) KID database was used to study hospital costs associated with AIS pts (ICD-9 737.30) undergoing PSF (ICD-9 81.05) during the years 1997, 2000, and 2003.

Collaboration with Orthopaedic Surgery ; Radiology

Collaborating Faculty: William C. Lippert, MPH; Charles T. Mehlman, DO, MPH; Roger Cornwall, MD; Mohab B. Foad, MD; Tal Laor, MD; Christopher G. Anton, MD

The Intra- and Inter-rater Reliability of Glenoid Version and Glenohumeral Subluxation Measurements in Neonatal Brachial Plexus Palsy: Progressive and disabling glenohumeral dysplasia commonly occurs as a secondary deformity in children with neonatal brachial plexus palsy (NBPP). A number of methods for quantifying glenohumeral dysplasia are currently in use; however, the most commonly reported quantitative measures have yet to be validated. The purpose of the study was to assess the intra- and inter-rater reliability of the glenoid version angle (GVA) and percent of the humeral head anterior to the scapular line (PHHA) measurements on axial magnetic resonance (MR) images.

Collaboration with Orthopaedic Surgery; Physical Medicine and Rehabilitation; Radiology ; Biostatistics and Epidemiology

Collaborating Faculty: Robert J. Talbert, MS; Linda J. Michaud, MD, PT; Charles T. Mehlman, DO, MPH; Douglas G. Kinnett, MD; Tal Laor, MD; Susan L. Foad, MPH; Beverly Schnell, PhD; Shelia Salisbury, PhD

EMG and MRI are independently related to shoulder external rotation function in neonatal brachial plexus palsy: Few studies exist regarding the ability of electromyography (EMG) and volumetric magnetic resonance imaging (MRI) of the infraspinatus muscle to complement the physical assessment of global shoulder external rotation in the neonatal brachial plexus palsy population. The purpose of this study was to evaluate the relationships of EMG and MRI with global shoulder external rotation based on analysis of the infraspinatus muscle.

Collaboration with Orthopaedic Surgery; Physical Medicine and Rehabilitation; Plastic Surgery ; Biostatistics and Epidemiology

Collaborating Faculty: Glendaliz Bosques, MD; Linda J. Michaud, MD, PT; Charles T. Mehlman, DO, MPH; Shari Wade, PhD; Kevin P. Yakuboff, MD; Mohab B. Foad, MD; Douglas G. Kinnett, MD; Judy A. Bean, PhD

The Use of Electrodiagnosis in Operative Decision-Making for Early Plexus Reconstruction in Birth Brachial Plexus Palsy: The aim of this study was to determine whether electrodiagnostic findings contribute unique information in the assessment of infants with birth brachial plexus palsy (BBPP) that is useful in decision making for operative versus non-operative management.

Collaboration with Orthopaedic Surgery; Physical Medicine and Rehabilitation; Occupational and Physical Therapy; Plastic Surgery

Collaborating Faculty: Charles T. Mehlman, DO, MPH; Linda J. Michaud, MD, PT; Allison J. Allgier, OTR/L; Mohab B. Foad, MD; Kevin P. Yakuboff, MD; Roger Cornwall, MD; William C. Lippert, MPH

Prospective Study of the Treatment for Brachial Plexus Birth Palsy: This is a multi-site prospective study performed in collaboration with 11 other sites throughout the world. The primary site is Boston Children's Hospital (Boston, MA, USA). At

present, there is clinical acceptance that microsurgery benefits infants without recovery of biceps function by the age of about 3-6 months. The current recommendations for the timing of microsurgical repair ranges between the ages of 3 and 6 months in most circumstances. There is significant controversy, however, regarding the ideal timing for microsurgery and the outcome / results of natural history and surgical repair. Therefore, the purpose of the multi-center prospective research study is to: 1) determine the optimal age for microvascular repair of infants with Brachial Plexus Birth Palsy (BPBP) and persistent upper extremity weakness; 2) compare the functional outcome of patients undergoing early microscopic repair versus late reconstructive surgery; 3) compare the functional outcome of patients undergoing microscopic repair and late reconstructive surgery versus late reconstructive surgery alone and 4) determine the natural history of neurologic recovery in patients with BPBP.

Collaboration with Orthopaedic Surgery; Radiology

Collaborating Faculty: Shital Parikh, MD ; Eric Wall, MD; Tal Laor, MD

Orthopaedic Sports Medicine and Radiology Conference: Monthly conference to review radiographic images of sports medicine patients.

Collaboration with Orthopaedic Surgery; Sports Medicine Biodynamic Center; Radiology;

Collaborating Faculty: Eric Wall, MD ; Shital Parikh, MD; Jon Divine, MD; Michael Shaffer, MD; Corey Ellis, MD; Tal Laor, MD

JOCD Center: Multi-disciplinary, multi-center clinical and research program for the treatment of pediatric patients with Juvenile Osteochondritis Dissecans (JOCD).

Collaboration with Orthopaedic Surgery ; Radiology

Collaborating Faculty: Eric Wall, MD; Tal Laor, MD; Andy Zbojniewicz, MD

JUPITOOR Project OCD Study Group of North America: Cincinnati Children's Hospital is the co-founder of this multi-center, multi-disciplinary, international research effort to cure Juvenile Osteochondritis Dissecans within the next decade. The group can be accessed at www.osteochondritisdissecans.org and represents an on-going collaboration between physicians at CCHMC, Children's Hospital Boston, The Children's Hospital of Philadelphia, Vanderbilt University, Medical College of Wisconsin, The Hospital for Sick Children (Toronto), Rady's Children's Hospital and UC San Diego, among others.

Faculty Members

Eric Wall, MD, Associate Professor ; *Director, Pediatric Orthopaedic Surgery; Director, Orthopaedic Sports Medicine; Director, Orthopaedic Research*

Research Interests: Scoliosis and Sports Medicine

Donita Bylski-Austrow, PhD, Research Associate Professor ; *Director of Biomechanics Research*

Research Interests: Spine Biomechanics

Roger Cornwall, MD, Assistant Professor ; *Co-Director, The Hand and Upper Extremity Center*

Research Interests: Hand and Upper Extremity

Alvin Crawford, MD, Professor ; *Director, Spine Center and Fellowship Program*

Research Interests: Scoliosis and Neurofibromatosis

Twee Do, MD, FAAP, Assistant Professor ; *Director, Neuromuscular Services*

Research Interests: Neuromuscular

Viral Jain, MD, Assistant Professor

Research Interests: Scoliosis

Charles Mehlman, DO, MPH, Associate Professor ; *Director, Musculoskeletal Outcomes Research, Pediatric Orthopaedic Resident Education, Brachial Plexus and Co-Director of the Limb Reconstruction Center*

Research Interests: Spine Bracing and Evidence-Based Medicine

Shital Parikh, MD, Assistant Professor

Research Interests: Sports Medicine

Junichi Tamai, MD, Assistant Professor ; *Director, Physician Assistant Program*

Research Interests: Process Improvement

Clinical Staff Members

- Lance Bolin, PA-C
- Michael Hood, PA-C
- Hillary McClung, PA-C
- Mary Pam Pfister, PA-C
- Adriana Reinersman, PA-C

Trainees

- Dave Agelillo, DO, PGY5, Peninsula Hospital Center, Far Rockaway, New York

- **Brandon Boyce, MD**, PGY3, West Virginia University, Morgantown, WV
- **Steven Brantley, MD**, PGY4, University of Cincinnati, Cincinnati, Ohio
- **Michael Callan, DO**, PGY4, Henry Ford Malcomb Hospital/Bi-County, Warren, Michigan
- **Lori Catanzaro, MD**, PGY4, Bethesda North Family Practice, Cincinnati, OH
- **Barry Davis, MD**, PGY3, West Virginia University, Morgantown, WV
- **Benjamin Debelak, DO**, PGY3, Ingham Regional Medical Center, Lansing, Michigan
- **Rasesh Desai, MD**, Fellow, VS Hospital NHL, MMC, India
- **Emily Dixon, MD**, PGY4, Bethesda North Family Practice, Cincinnati, OH
- **Bradley Dunkin, MD**, PGY2, University of Cincinnati, Cincinnati, Ohio
- **Dave Eisenhauer, DO**, PGY4, Oklahoma University Medical Center, Oklahoma City, OK
- **Nabil Farakh, DO**, PGY4, Peninsula Hospital Center, Far Rockaway, New York
- **Vivien Fongue, DO**, Intern, Grandview Hospital, Dayton, Ohio
- **Nathan Gause, MD**, PGY4, University of Cincinnati, Cincinnati, Ohio
- **Ryan Gocke, MD**, PGY5, West Virginia University, Morgantown, WV
- **Mikhail Itingen, DO**, PGY3, Peninsula Hospital Center, Far Rockaway, New York
- **Oner Khera, MD**, PGY4, University of Cincinnati, Cincinnati, Ohio
- **Sarah Kindt, MD**, PGY4, Bethesda North Family Practice, Cincinnati, OH
- **Richard Lin, MD**, Intern, Grandview Hospital, Dayton, Ohio
- **Hongbo Liu, MD**, Fellow, Peking Union Medical College Hospital, Beijing, China
- **Adam Metzler, MD**, PGY2, University of Cincinnati, Cincinnati, Ohio
- **Nikki Nemeth, MD**, PGY2, University of Cincinnati, Cincinnati, Ohio
- **Dzi-View Nguyen, MD**, Intern, Grandview Hospital, Dayton, Ohio
- **Bobby Oommen, MD**, Fellow, Kasturba Medical College, Manipal Academy of Higher Education, Manipal, India
- **Saila Patel, DO**, PGY3, Peninsula Hospital Center, Far Rockaway, New York
- **Vytatus Ringus, MD**, PGY5, West Virginia University, Morgantown, WV
- **Vivek Sharma, MD**, Fellow, GS Medical College and KEM Hospital Program, University of Mumbai, Mumbai, India
- **Christopher Sherry, DO**, PGY4, Ingham Regional Medical Center, Lansing, Michigan
- **Rafal Stachowicz, MD**, PGY2, University of Cincinnati, Cincinnati, Ohio
- **Kyle Switzer, DO**, PGY3, Ingham Regional Medical Center, Lansing, Michigan
- **Matthew Tweet, MD**, PGY4, University of Cincinnati, Cincinnati, Ohio
- **Dan Warner, MD**, PGY3, West Virginia University, Morgantown, WV

Significant Accomplishments

Spine staple moves forward

Eric Wall, MD, received \$2 million to fund a multi-center study on a new, minimally invasive scoliosis device invented, developed and manufactured in Cincinnati. The HemiBridge spine clip, about the size of a wedding ring, redirects the growth of a young curved spine without the need for rigid fusion. It is the first device in the world specifically approved by the FDA to redirect spine growth as part of an investigational study.

Spine surgeons typically treat severe scoliosis with an extensive surgery that fuses the spine into a rigid column using rods, screws, hooks and a bone graft. This small device could revolutionize scoliosis treatment.

Scientific presentations

Our division led the field in podium and poster presentations at the annual meeting of the Pediatric Orthopaedic Society of North America, held this year in Kona, Hawaii. Charles Mehlman, DO, MPH, was a leading presenter on supracondylar humerus fractures, brachial plexus injuries and forearm fractures.

Nationally recognized care

Orthopaedics was ranked among the nation's top five pediatric orthopaedic programs by *US News and World Report*.

Division Publications

1. :

Grants, Contracts, and Industry Agreements

Grant and Contract Awards	Annual Direct / Project Period Direct
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Grant and Contract Awards	Annual Direct / Project Period Direct
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Mehlman, C

Bracing in Adolescent Idiopathic Scoliosis

University of Iowa (National Institutes of Health)

R01 AR 052113

09/01/07 - 08/31/11

\$7,000 / \$45,042

Current Year Direct

\$7,000

Total

\$7,000