

Report from the Division of Orthopaedic Surgery at The Children's Hospital of Philadelphia

JOHN P. DORMANS, M.D.* AND JULIA E. LOU, B.A.†

Greetings from The Children's Hospital of Philadelphia (CHOP) Division of Orthopaedic Surgery to colleagues, alumni, and past and future trainees. The Division of Orthopaedic Surgery at CHOP had an excellent year in 2002. Existing programs within the Division continue to grow, improving the quality and availability of care for our young patients, while new initiatives further strengthen the Division's academic and research mission within the greater orthopaedic community (Fig. 1).

The Children's Hospital of Philadelphia (CHOP) also continues to thrive. CHOP was honored for the second year in a row as the nation's #1 Children's Hospital by *Child* magazine (Fig. 2). On-campus growth and construction continues at a rapid pace. The addition to the Abramson Research Center will be completed early in 2003, creating much-needed, additional research facilities for basic research groups. Further, the overall growth of the physical facility continues as the South Tower is projected for completion in late 2003 and the infill building construction continues. The construction of the new West Tower (with new expanded operating room facilities) will begin shortly. Regional health system facilities continue to expand, including plans for a new musculoskeletal and imaging center at our Voorhees Specialty Care Center (Fig. 3).

Clinical Program

The Musculoskeletal Center at CHOP has been open now for a little over one year and continues to serve patients of the entire Musculoskeletal Team. The Divisions of Orthopaedic Surgery, Rheumatology, Physical Medicine and Rehabilitation, and the Programs of Physical and Occupational Therapy, Adaptive Equipment, Orthotics and Prosthetics, and our multidisciplinary neuromuscular pro-

grams (including the Cerebral Palsy, Muscle Disorders and Spina Bifida Programs) continue to work together to comprise the Musculoskeletal Team. Both staff and patients alike are enjoying the benefits of the new space and facilities (including PACS imaging), which lends a multidisciplinary approach to musculoskeletal diseases. The Multidisciplinary Steering Committee continues to meet quarterly to keep shared projects, initiatives, research, and teaching active and moving forward.

The Division of Orthopaedic Surgery Orthopaedic has expanded its ability to deliver care across the Delaware Valley and beyond. Attending surgeons rotate between the offices at CHOP main campus and the multiple satellite offices located in Exton, PA, Chalfont, PA, King of Prussia, PA and Voorhees, NJ (Fig. 3). The satellites have enabled the Orthopaedic Surgery attendings to increase their availability and ability to provide specialty care in areas outside the city of Philadelphia. Specifically, the Sports Medicine and Performance Center at King of Prussia focuses on sports medicine and is frequented by many child and young adult athletes throughout the region. The plans for a second musculoskeletal/sports center at the Voorhees Specialty Care Center are progressing nicely with a projected opening date of June 2004.

The many activities and programs of the Division of Orthopaedic Surgery and the Musculoskeletal Center are listed and described on CHOP website (<http://www.chop.edu>). We have recently completed the annual update of the orthopaedic website (<http://orthopaedics.chop.edu/>), increasing availability to patients searching for information about musculoskeletal conditions on the Internet. Our staff now includes 12 surgeons, 5 nurses, and a 19 member office staff at the Division of Orthopaedic Surgery offices in the Wood Building of CHOP.

Teaching

We currently have two funded, 1-year fellowships at CHOP: the clinical fellowship (now ACGME approved) and the research fellowship. Benjamin Roye, MD currently serves as our clinical fellow while Harish Hosalkar, MD serves as our research fellow. Dr. Roye is a graduate of the College of Physicians and Surgeons of Columbia University and completed his orthopaedic residency through the

* Chief, Division of Orthopaedic Surgery, The Children's Hospital of Philadelphia, Professor of Orthopaedic Surgery, University of Pennsylvania School of Medicine, Philadelphia, PA.

† Clinical Research Coordinator, Division of Orthopaedic Surgery, The Children's Hospital of Philadelphia, Philadelphia, PA.

Address correspondences to: John P. Dormans, M.D., Division of Orthopaedic Surgery, The Children's Hospital of Philadelphia, Wood Building, 2nd Floor, 34th and Civic Center Blvd., Philadelphia, PA 19104.

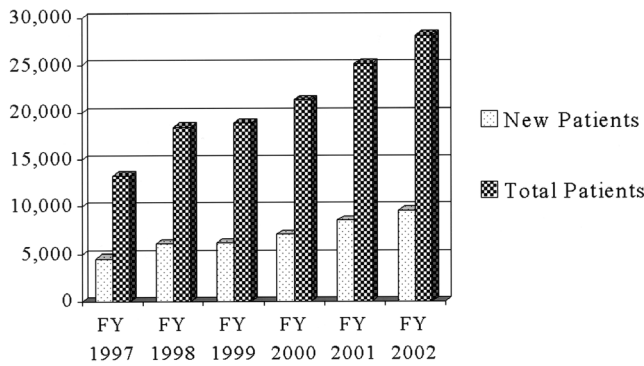


Fig. 1. Growth of CHOP orthopaedic outpatient volume.

College of Physicians and Surgeons of Columbia University at New York Orthopaedic Hospital. Dr. Hosalkar is our research fellow visiting from Bombay, India. He just completed a one-year fellowship at Greater Ormond St. Hospital in London, England (Fig. 4).

Last year's Fellows, Junichi Tamai, MD and Bulent Erol, MD, have continued in their orthopaedic careers with great success. Dr. Tamai, former Clinical Fellow, currently serves as an attending surgeon at Cincinnati's Children's Hospital in Cincinnati, OH. Dr. Erol completed his residency in Turkey and was recently married upon his return to Istanbul. He now serves as an attending surgeon at the Hospital of the University of Marmara in Istanbul, Turkey.

We also offer an International Visiting Scholars Program (IVSP) listed through the International Center for Orthopaedic Education website (www.icoe.aoassn.org). Two to three international visiting scholars visit CHOP through this program yearly. Drs. Onder Ofluoglu, Assistant Chief at Kartal Education and Research Hospital II in the Orthopedics and Trauma Clinic in Cevizli-Istanbul, Turkey and

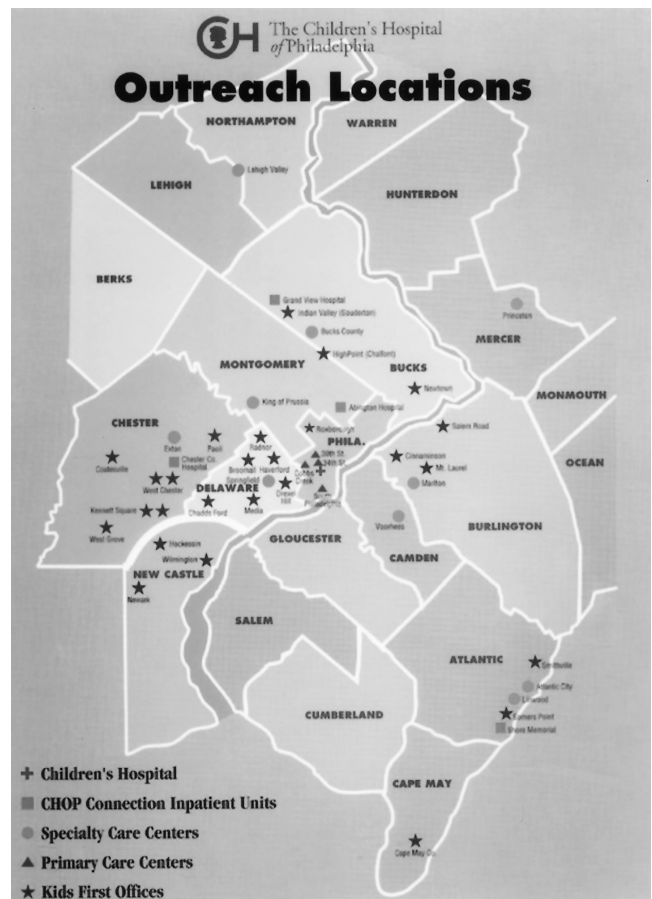


Fig. 3. CHOP orthopaedic satellite offices are located throughout the Philadelphia region.

Harun Gungor from SSK Istanbul Hospital in Istanbul, Turkey spent time in the Division of Orthopaedic Surgery during the summer and fall conducting clinical research and observation (Fig. 5). Dr. Vo Quang Dinh Nam from the Hospital for Traumatology and Orthopaedics in Ho Chi Min City, Vietnam spent 6 months on observation in the Division (Fig. 5). Dr. Nicholas Lutz (Fig. 5), a pediatric surgeon in the Department of Pediatric Surgery, University Hospital of



Fig. 2. CHOP is honored by *Child* magazine for the second year in a row as the #1 Children's Hospital.

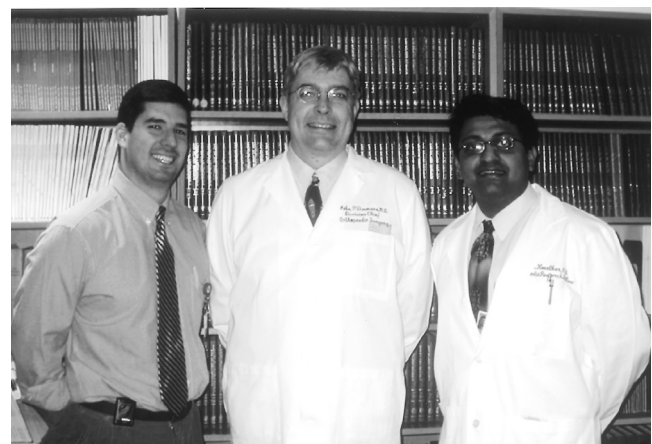


Fig. 4. Dr. Benjamin Roye, Clinical fellow (left); Dr. Harish Hosalkar, Basic Science Research Fellow (right) in the Division of Orthopaedic Surgery with Dr. Dormans.



Fig. 5. (A) Drs. Onder Ofluoglu and (B) Harun Gungor (left), Visiting International Scholars from Turkey. (C) Dr. Vo Quang Dinh Nam from the Hospital for Traumatology and Orthopaedics in Ho Chi Minh City, Vietnam. (D) Dr. Nicholas Lutz, Trauma Fellow and Pediatric Surgeon in the Department of Pediatric Surgery, University Hospital of Lausanne, Switzerland.

Lausanne, Switzerland, is with us to learn more about pediatric orthopaedic trauma for five months.

Orthopaedic Surgery also had the opportunity to host traveling surgeons from 2 different societies in 2002. The Scoliosis Research Society (SRS) Traveling Fellows, Dr. B.F. Hodgson (New Zealand), Dr. Muharrem Yazici (Turkey), and Dr. Jin-Hyok Kim (Korea) (Fig. 6) visited August 27-29, 2002 and the American Orthopaedic Association-Belgian Orthopaedic Society of Traveling Fellows, Drs. Franky Steenbrugge and Marc Jayankura (Fig. 7), visited June 5-7th, 2002.

Other visitors to the Division of Orthopaedic Surgery included Visiting Professor, Dr. Chakra Raj Pandey, who arrived from Kathmandu University Medical School in Katmandu, Nepal on August 1, 2002 (Fig. 8). Dr. Pandey presented a lecture on the current state of Orthopaedic care in his home country of Nepal. Additionally, James Beaty,

MD is scheduled as the 2003 Jesse T. Nicholson Visiting Professor.

The multidisciplinary Musculoskeletal Basic Science Seminar Lecture series continues with great success. Recent guest lecturers including Frederick S. Kaplan, MD, Isaac & Rose Nassau Professor of Orthopaedic Molecular Medicine and Chief of the Division of Metabolic Bone Diseases & Molecular Medicine, Department of Orthopaedic Surgery, Hospital of the University of Pennsylvania and Louis Soslowsky, Ph.D., Director of Orthopaedic Research for the University of Pennsylvania have addressed audiences speaking about emerging musculoskeletal advances. Most recently, Dr. H. Lee Sweeney, Ph.D., William Maul Measey, Professor and Chairman of the Department of Physiology at The University of Pennsylvania School of Medicine, presented his talk, "Potential Strategies for Treatment of Muscular Dystrophies" at the 3rd installment of the



Fig. 6. Dr. John P. Dormans (center) and Dr. Denis S. Drummond (left) with the 2002 Scoliosis Research Society DePuy AcroMed Traveling Fellows, (from left) Dr. B.F. Hodgson (New Zealand), Dr. Muharrem Yazici (Turkey), and Dr. Jin-Hyok Kim (Korea).

Musculoskeletal Seminar Series. These multidisciplinary basic science lectures are attracting 80-100 individuals campus-wide per lecture from as many as 15 different divisions and programs, all with an interest in pediatric musculoskeletal basic research. Persons interested in being included on the Seminar Lecture series mailing list should contact the Division of Orthopaedic Surgery (Bea Chestnut, 215-590-1527).

Additionally, Steven Frick, MD spent 4 days visiting and observing in the Division as part of the American Academy of Orthopaedic Surgeons year-long Leadership-Fellows Program. Dr. Frick (Mentee) is a pediatric orthopaedic surgeon paired with Dr. Dormans (Mentor) as part of the inaugural American Academy of Orthopaedic Surgeons Leadership Fellows Program class. Dr. Frick arrived from

the Carolinas Medical Center in Charlotte, North Carolina (Fig. 9).

The Division also participated in international travel. Dr. John Flynn was selected as a Traveling Fellow by the Pediatric Orthopaedic Society of North America (POSNA). He and 2 other Traveling Fellows visited the major pediatric orthopaedic centers in The Czech Republic, Austria, Italy and Turkey, delivering lectures and operating with several of the Professors.

Research

Kenro Kusumi, PhD, has been Director of Pediatric Orthopaedic Basic Science Research for the past two years and is leading the Division's Congenital Vertebral



Fig. 7. Drs. Franky Steenbrugge (left) and Marc Jayankura (right), American Orthopaedic Association - Belgian Orthopaedic Society Traveling Fellows with Dr. John P. Dormans (center).



Fig. 8. Dr. Chakra Raj Pandey from Kathmandu University in Kathmandu, Nepal.

Malformation Research Initiative (CVMRI). Dr. Kusumi is a geneticist specializing in mammalian spine development. He has been a Hitchings-Elion Fellow of the Burroughs Wellcome Fund at the National Institute of Medical Research in London and received a Ph.D. in Biology with Dr. Eric Lander, a leader of the Human Genome Project at

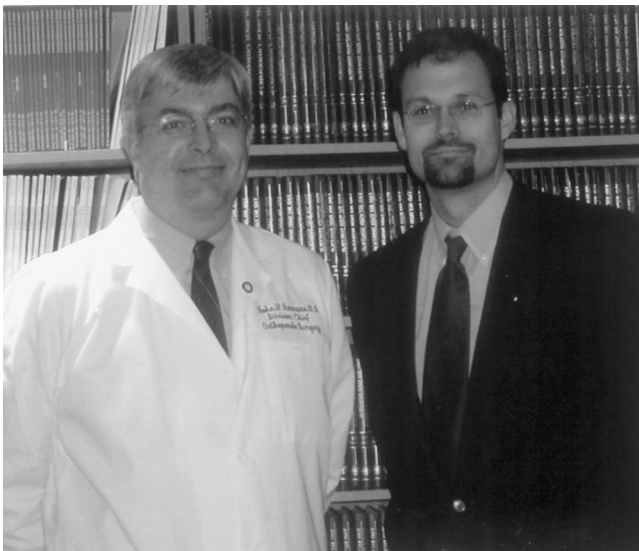


Fig. 9. Dr. Dormans and AAOS LFP Fellow, Steven Frick, MD.

the Massachusetts Institute of Technology and Whitehead Institute. Dr. Kusumi is one of the top spine development researchers in the world having cloned the mouse pudgy gene and the homologous human disorder, spondylocostal dysostosis (Kusumi K, et al. The mouse pudgy mutation disrupts Delta homologue Dll3 and initiation of early somite boundaries. *Nat Genet.* 1998 Jul;19(3):274-8; Bulman MP, Kusumi K et al., Mutations in the human *Delta* homologue, *DLL3*, cause axial skeletal defects in spondylocostal dysostosis. *Nat Genet.* 2000 Apr;24(4):438-41). Dr. Kusumi and the CVMRI Team have been the recipient of several research awards and grants for their work, including grants from the Cervical Spine Research Society and the Ethel Brown Foerderer Fund for Excellence.

The CVMRI has enlisted the collaboration of leading orthopaedic surgeon researchers and geneticists during the past year. Benjamin Alman, MD, FRCS, Associate Professor, Divisions of Orthopaedic Surgery and Program in Developmental Biology at the Hospital for Sick Children and University of Toronto, is a co-investigator on research to identify the genetic etiology of congenital scoliosis. Clinical geneticists working on spinal disorders, including Peter Turnpenny, MBChB, of the Royal Devon & Exeter Hospital and University of Exeter, England, Alberto Santiago Cornier, MD, Ponce School of Medicine, Puerto Rico, and Axel Bohring, MD, Östholstein Kliniken, Germany, have all visited the CVMRI team here at CHOP during the past year. Additional team members include Melissa Tonnesen, MS, genetic counselor, and Ji-Soo Han, MD, PhD, who has joined recently from Thomas Jefferson University to work on the CVMRI molecular genetic studies. To date, the CVMRI group has assembled a unique genetic resource of over 350 patients and 50 families with congenital vertebral malformations, and has submitted several manuscripts describing the first phase of these research efforts.

CHOP Division of Orthopaedic Surgery Endowed Chair Fund continues to provide funding support for the work of Dr. Kusumi and the Congenital Vertebral Malformations Research Initiative (CVMRI), as well as funding for Dr. Hosalkar (Basic Science Research Fellow) and departmental Research Coordinators, Carrie Grabowicz and Julia Lou.

Sumeet Garg is currently conducting clinical research in the Division as a Doris Duke Fellow (Fig. 10). He comes to us from Harvard Medical School and will spend the year working in our Division at CHOP with Dr. Dormans before returning to Boston to finish his fourth year. Although Sumeet is the first Doris Duke Fellow to join our department, we hope to continue participating in this fellowship opportunity in future years.

Our pediatric orthopaedic attendings continue to present research studies at numerous orthopaedic conferences throughout the world, including the American Academy of Orthopaedic Surgery (AAOS), the Pediatric Orthopaedic Society of North America (POSNA), the European Pediatric Orthopaedic Society (EPOS), the Scoliosis Research Society (SRS), the American Orthopaedic Association (AOA), and the Musculoskeletal Tumor Society (MSTS) and others. Our attendings have been involved in leading

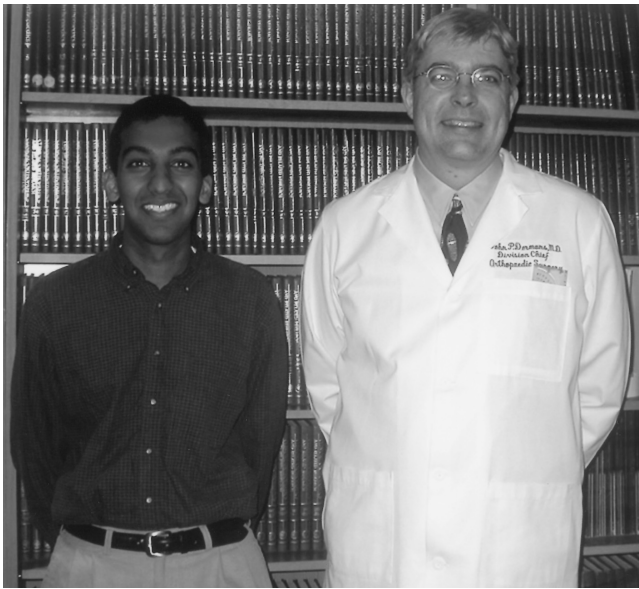


Fig. 10. Doris Duke Fellow, Sumeet Garg (left) with Dr. Dormans (right).

several courses within these societies and organizations. Dr. Dormans and John Sarwark from Chicago Northwestern University Children's Hospital successfully co-chaired the AAOS 2002 Orthopaedic Learning Center Course (OLC) on pediatric orthopaedic trauma that attracted pediatric orthopaedic surgeons from the United States and around the world on October 4-6, 2002 at the Academy's OLC in Rosemont, Illinois (Fig. 11). Dr. Dormans will again chair the next course in 2004. Dr. Flynn will organize this year's POSNA One-Day Course on Trauma in Amelia Island, FL. Dr. Dormans also chaired and organized the first Scoliosis Research Society (SRS) Foundation's Spinal Deformity Course at the SRS Meeting in Cleveland.

Our Orthopaedic team has also been involved with the leadership of several national organizations. Denis



Fig. 11. Drs. John Sarwark (left) and John Dormans (right) (co-chairs of the 2002 Surgical Techniques for Managing Pediatric Orthopaedic Trauma Course at the American Academy of Orthopaedic Surgeons Orthopaedic Learning Course) in Rosemont, Illinois on October 4-6, 2002.

Drummond, MD has completed his tenure as President of the Scoliosis Research Society (SRS) (Fig. 12). Dr. Dormans was recently elected to the SRS Board of Directors and was also elected as Chairman of the Board of Directors of Orthopaedic Overseas. Dr. Dormans received the Leadership Award from Orthopaedics Overseas for 2002 at the American Academy of Orthopaedic Surgeons in Dallas, Texas last February. Additionally, Dr. Flynn completed a year of service on the Board of Directors of POSNA.

Philanthropy

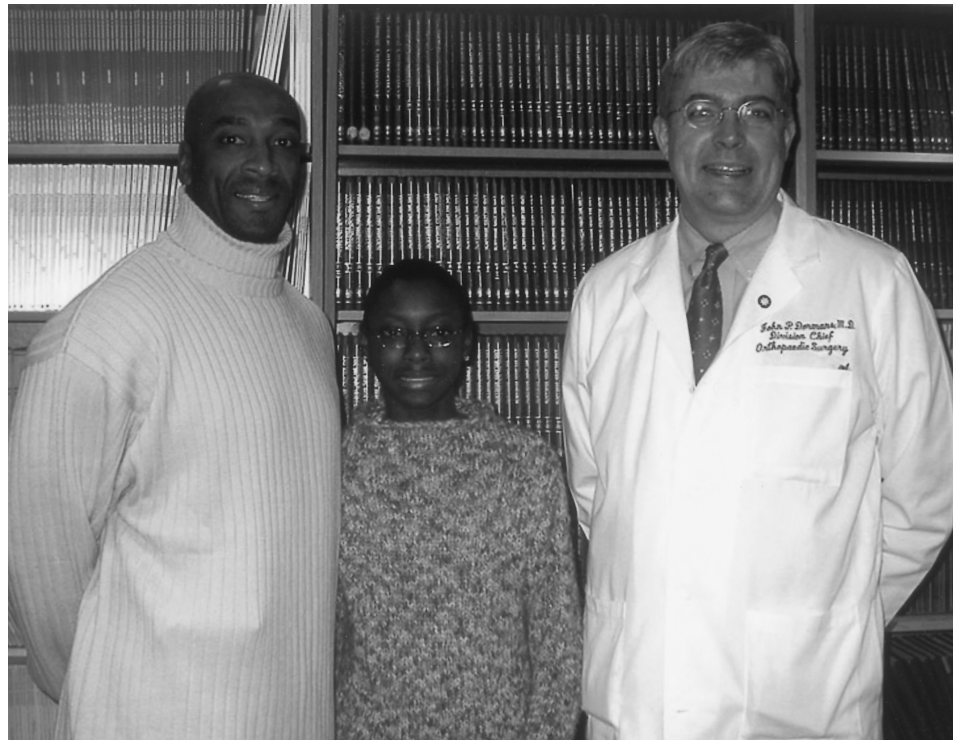
The Division of Orthopaedic Surgery continues to grow through the generosity of a number of individuals such as those who provide support for the Friends of Orthopaedic Surgery Fund, which supplements the departments teaching and research expenses.

The Division of Orthopedic Surgery was also the named beneficiary of the CHOP 46th Annual Daisy Day Event at the Park Hyatt at the Bellevue on April 11, 2002. Additionally, the Friends of Seashore House Black-tie Dinner-dance on April 13 celebrated the creation of The Musculoskeletal Center at CHOP with proceeds going to the



Fig. 12. Dr. Denis S. Drummond delivers the Presidential Address at the 37th Annual Meeting of the Scoliosis Research Society in Seattle, WA, September 19-21, 2002.

Fig. 13. Dr. Dormans with his patient, Adrienne Fryar (center), and her father, Irving Fryar (left). Adrienne had successful correction of her congenital scoliosis by Dr. Dormans. She and her father are helping to initiate the Thoracogenic/Congenital Heart Scoliosis Program at CHOP.



Center's new Multidisciplinary Fund. The Division was also given two generous grants from the Women's Committee of CHOP.

The growth of our research and educational program would not be possible without the generous support of those individuals and groups. On behalf of the members of the Orthopaedic Surgery team, our patrons, and families, we thank you. We also appreciate the support of Irving Fryar and the Irving Fryar Foundation for the support in forming the Congenital Heart/Thoracogenic Scoliosis Research

Initiative in the Division of Orthopaedics at The Children's Hospital of Philadelphia (Fig. 13).

Summary

In summary, it has been another productive year for the Division of Orthopaedic Surgery at CHOP. We look forward to many years of collaborative interaction with the University of Pennsylvania Orthopaedic Department and Residency Program in the years to come.