



Spinal Deformity Surgery Program at All Children's Hospital

TABLE OF CONTENTS

Spinal Deformity Program	A1
Jonathan Ellen M.D.	A3
New Pediatric Residency Program	A4
ACH Welcomes	A5
Applied Behavior Analysis Services	A6
Applied Behavior Analysis Case Study	A7

The spinal deformity surgery program at All Children's Hospital is led by Jeffrey B. Neustadt, M.D. and Gregory V. Hahn, M.D. who have performed over 1,200 scoliosis surgical procedures to date over the past 21 years. More than 100 children and adolescents have been treated surgically each year in the past few years. Utilizing the most advanced treatment options such as intraoperative computerized image guidance, their cases are completed in a new operating room equipped with a navigation suite. While technology is helpful, the team of nurses, scrub techs, neuromonitoring personnel, blood salvage perfusionists, and experienced pediatric anesthesiologists is even more critical. Excellent patient outcomes reflect the outstanding caliber of the entire multidisciplinary team.

Drs. Neustadt and Hahn evaluate and treat all types of scoliosis and kyphosis. Congenital scoliosis or

kyphosis occurs during the formation of the vertebrae in the embryonic stage of development. It is often associated with congenital fusion of the ribs, and may also be seen in conjunction with a number of other non-orthopaedic anomalies affecting the heart, kidneys, upper extremities and gastrointestinal tract: the so-called VACTERL syndrome. Scoliosis occurs secondary to muscle weakness or paralysis frequently seen in cerebral palsy, muscular dystrophy, spina bifida, and spinal muscular atrophy. The cause of idiopathic scoliosis is unknown but is multifactorial and includes a strong genetic predisposition. Idiopathic scoliosis may occur at any age but is most commonly seen in adolescence. If it progresses, it usually does so most rapidly during puberty.

Idiopathic scoliosis is the pediatric spinal condition seen most commonly by family physicians and pediatricians. This condition affects approximately 7



million people in the United States. Of every one thousand children, three to five will develop scoliosis that is considered significant enough to treat. While scoliosis is more common, Scheuermann's kyphosis also occurs and severe cases require treatment as well. Scoliosis is usually painless, while severe kyphosis is commonly associated with pain.



Above Top: Preoperative Scheuermann's Kyphosis
Above: Postoperative after

After the child has been diagnosed with scoliosis, several courses of action are possible. Mild curves that remain at 20 degrees or less are observed and monitored every 4 to 6 months. Curves greater than 25 degrees may be amenable to orthotic treatment in an effort to prevent further progression. Investigation continues to determine the effectiveness of braces in preventing progression of scoliosis. Unfortunately, no brace has been shown to actually improve scoliosis. That desired outcome is only available via surgical treatment. Electrical muscle stimulation, exercise programs and manipulation have not been found to be effective treatments for scoliosis. Attempts to treat kyphosis orthotically have been largely unsuccessful but may be tried.

The surgical treatment of idiopathic scoliosis is usually reserved for curves that have progressed beyond 40 to 45 degrees. If left untreated, continued progression of these curves may lead to pulmonary dysfunction from restrictive lung disease; chronic, severe pain; and psychosocial disability from



Left: Preoperative Idiopathic Scoliosis Right: Postoperative

deformity with decreased quality of life as measured with validated quality of life outcomes instruments. Likewise, kyphosis of greater than 65 or 70 degrees is often indicated for surgery due to pain and disability.

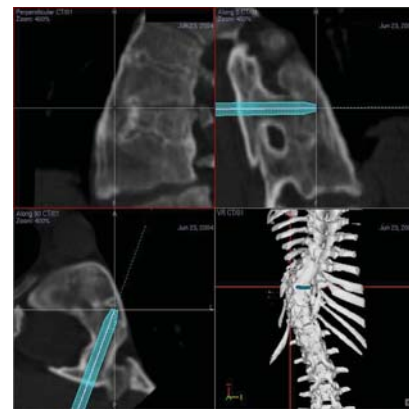
When surgery is indicated, Drs. Neustadt and Hahn who are fellowship-trained, pediatric orthopaedic spine surgeons, utilize the most advanced techniques in reconstructive spinal surgery. Advances in surgical technology have led to highly effective and safe surgical procedures resulting in excellent outcomes as measured by patient satisfaction surveys as well as by standard radiographic measurements.

Modern spinal instrumentation has led to significant improvement in the 3-D correction of spinal deformity but the placement of pedicle screws as anchors is significantly more challenging in the three-dimensionally deformed spine which is not only curved in the frontal and sagittal planes, but rotated along the axis of the spine as well. Use of CT-based, intra-operative image guidance has facilitated placement of these screws. Drs. Neustadt and Hahn are nationally and internationally renowned in use of this technology, having committed to it over ten years ago. Surgeons from Europe and throughout the United States have visited them in the operating room at All Children's to learn these techniques.

CT-based, intra-operative image guidance allows a surgeon to navigate the spine with "smart tools" by merging the data from a preoperatively acquired CT scan of the spine with in vivo

anatomical reference points that have been preoperatively selected from the 3D, axial and sagittal CT images. This has facilitated rapid and accurate placement of pedicle screws. There is virtually no tolerance for inaccurate placement due to the aorta, spinal cord and lung being immediately

adjacent to the vertebral pedicles. This technology also enables more precise sizing of the screws within the pedicles



and the vertebral body, lessening the chances of loosening. From the late 1980s until early in the new millennium the use of hook and rod instruments were used where results saw only 50 percent correction of frontal plane. Now with pedicle screw and rod fixation clinical outcomes have scoliosis correction of 75 to 95 percent, normalization of sagittal plane profile, and better derotation of the spine. The combination of advanced computer technology, precisely engineered metallic implants, and cutting-edge biologics utilized in bone grafting has led to the current state of the art in scoliosis and spinal deformity surgery. With continued basic science research and clinical investigation, even more exciting advances will be seen in the future with Drs. Neustadt and Hahn and All Children's leading the way.

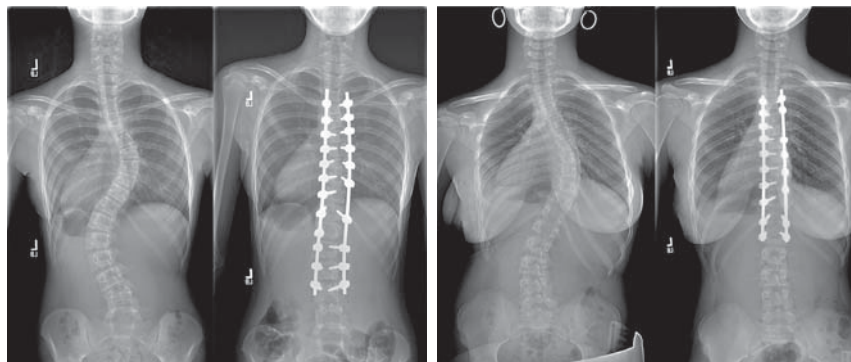
Contact Information:
Children's Orthopaedic and Scoliosis
Surgery Associates, LLP

www.chortho.com

Jeffrey B. Neustadt, M.D.
Chairman of the Division of Orthopaedic
Surgery at All Children's Hospital
Clinical Professor of Orthopaedic
Surgery, Clinical Professor of
Pediatrics at University of South
Florida

Gregory V. Hahn, M.D.
Former Chief of Staff at All Children's
Hospital
Affiliate Assistant Professor at USF
College of Medicine, Department of
Orthopaedics and Sports Medicine

Examples of pre-op and post-op spinal deformity cases:



Double Major Scoliosis 13 YO Female

Thoracic Scoliosis 14 YO Female

625 6th Avenue South, Suite 450
St Petersburg, Florida 33701
(727) 898-2663

2727 West Dr Martin Luther King Bld., Suite 720
Tampa, Florida 33607
(813) 879-2663

Jonathan Ellen, M.D. Named President of All Children's Hospital



On July 26, 2012 Jonathan Ellen, M.D., was appointed President of All Children's Hospital. In his new role, he will also serve as President of the All Children's Hospital Foundation and Chairman of the All Children's Health System Board (which oversees the All

Children's Specialty Physicians group and other entities). Dr. Ellen has served as Interim President since the retirement of Gary Carnes this past February. Prior to that time, he was the Johns Hopkins University School of Medicine vice dean for All Children's Hospital and All Children's Hospital physician in chief.

Since arriving at All Children's in 2011, Dr. Ellen has led the effort for the development of mission-centric research and education initiatives, including a new pediatric residency program and translational research programs that have strengthened the integration of research and education with outstanding clinical care at the 259-bed St. Petersburg hospital.

"We are impressed with the vision, knowledge and experience Dr. Ellen brings to the position," said Jack Kirkland, Chairman of the All Children's Hospital Board of Trustees. "We are certain that we have selected the right person to lead All Children's in its

journey to become a top pediatric academic medical center."

All Children's Hospital became a fully integrated member of Johns Hopkins Medicine in April 2011. Since then, the hospital has established a new Office of Medical Education and Office of Research, launched a clinical research mentorship program and created new opportunities for collaboration between clinicians in Baltimore and St. Petersburg.

Dr. Ellen joined the Johns Hopkins University School of Medicine faculty in 1999 and in 2006 was named vice chair of the Department of Pediatrics and director of the Center for Child and Community Health Research. In the same year, he also became director of the Department of Pediatrics and Neonatology at Johns Hopkins Bayview Medical Center, where he already had established a growing research program to complement the academic and clinical missions of that campus. He is a professor of pediatrics at the Johns Hopkins University School of Medicine and a professor in the Department of Epidemiology and the Department of Population, Family and Reproductive Health in the Johns Hopkins Bloomberg School of Public Health.

Raised in Philadelphia, Dr. Ellen graduated from Temple University Medical School and completed his residency in pediatrics at Children's Hospital of Philadelphia. He completed a fellowship in adolescent medicine at the University of California San Francisco (UCSF) in addition to fellowships in sexually transmitted diseases at UCSF, the San Francisco Department of Health and the CDC. He has received numerous grant awards from the NIH and CDC and has authored more than 140 peer-reviewed scientific articles and 30 reviews, editorials and book chapters.