



Connections 2009



**A Newsletter from the Pediatric Orthopedic
Training Program
Rady Children's Hospital and University of California – San Diego**

Issue 5 – 2009



Mubarak

Wenger

Chambers

Newton

Wallace

Pring

Yaszay

Edmonds

Message from the Director

Dennis R. Wenger, M.D.

Introduction

Springtime brings the annual David Sutherland Visiting Professorship and reminds us that it is time to provide an update on the activities of the Rady Children's Hospital – University of California San Diego orthopedic program.

The aim of this newsletter is to keep former fellows, residents, friends and colleagues updated on the clinical activities of the department as well as on the future plans for our educational and research program.

Our mission is to provide world class patient care, education and

research for children's orthopedic conditions. The research is focused on clinical and biomechanical issues that allow early application to patient problems. In addition to orthopedic fellows, residents and medical students, we also educate nurse practitioners and physician assistants as they enter our program, allowing us to have a large and comprehensive clinical care program.

Recognition

Recent notification that the U.S. News and World Report 2009 Healthcare issue has ranked our orthopedic program as 4th in the U.S. confirms that our energy, strategy, and hard work are widely recognized and appreciated (see article in this issue).

Educational Activities

This has been an extremely successful year with continued growth in both our clinical and research activities. We are experiencing an increasing number of applicants

for fellowships throughout the United States and continue to attract fellows of the highest quality. A continued flow of outstanding fellows allows maximal function of our clinical program as well as allowing us to prepare pediatric orthopedic surgeons for the future who will be practicing throughout North America and the world.

Four current fellows will complete their fellowship year at the end of July, 2009, with four new fellows beginning on August 1, 2009 (featured in this newsletter).

The fellowship application process will become somewhat more organized in 2010 since the Pediatric Orthopedic Society of North America (along with the San Francisco match program – a private enterprise) have reached an agreement to allow all fellowship candidates to apply through a matching program.

Thus interviews will not begin until January 1, 2010 and will be completed by March 31, 2010, with the match completed in April. It is hoped that this process will make the selection of fellows a more standardized process.

Our residency continues to have high quality residents from UCSD, the San Diego Naval Medical Center, and the Wilford Hall Air Force program (San Antonio). This allows us to be exposed to the best orthopedic residents in North America and we greatly enjoy watching them mature and develop. We are happy to find each year that one or more chose to pursue a career in children's orthopedics.

Our international fellowship program continues, and at all times we have two international fellows studying both scoliosis as well as children's orthopedics.

Our nurse practitioner/physician assistant program has enlarged and we now have nine NP/PA's in our program, allowing us to provide both urgent and elective orthopedic care for the children in a population area of about 4.5 million people. Our 62,000 annual patient care visits (clinics, admissions) attests to this effort.

We look forward to the return of Lisa Crabb, RN, to direct our clinics and to coordinate the fellows and residents. After a period of "time-off" she is ready to continue her leadership in August.

Staff Additions

After the completion of his fellowship in July 2008, one of our fellows, Dr. Eric Edmonds, who had been an orthopedic resident in the Carolinas program in Charlotte (but a native of North County, San Diego) decided to do additional sports medicine training and then to join our fulltime faculty as our eighth staff member. His focus is on sports medicine and he has already developed a comprehensive practice with a large surgical volume as well as having started multiple research projects.

In addition, on July 1, 2009, we will be joined by Dr. Harish Hosalkar, from the University of Pennsylvania and Children's Hospital of Philadelphia. His special interests include complex hip disorders in childhood as well as orthopedic trauma.

Research Leadership

Our research program continues to be highly productive, resulting in many publications as well as multiple presentations at the Scoliosis Research Society, POSNA, and many other venues. Peter Newton provides the intellectual leadership and Tracey Bastrom the administrative guidance for the program. We also have the pleasure of bringing on a new PhD bioengineer, Dr. Diana Glaser, who will begin August 1, 2009. This assures continuation of our very productive research program.

Hospital News

Rady Children's Hospital continues to be fully utilized and we are moving into the final year of construction on the new \$350 million patient care building. All patient care beds will be moved into this area, likely in late 2010.

National and International Activities

Our staff continue to be active on a national and international basis. Each of the more senior staff members lectures throughout North America and the world, and several of our members have been in leadership positions, serving on the Board of Directors of the Pediatric Orthopedic Society of North America, the Scoliosis Research Society and the American Academy for Cerebral Palsy and Developmental Medicine.

Summary

The orthopedic education and research program at Rady Children's Hospital San Diego continues its national and international prominence. The addition of new orthopedic staff, a new PhD bioengineer as well as the completion of a new children's hospital building should enhance our productivity.

We appreciate the support of Rady Children's Hospital administration, our growing alumni group and all who are interested in our mission.

Dennis R. Wenger, M.D.

Director,
Pediatric Orthopedic Training Program
Children's Hospital – San Diego

Clinical Professor of Orthopedic Surgery
UCSD



New Staff



Eric W. Edmonds, M.D.

Eric Edmonds, M.D., joined our practice in August of 2008 upon completion of his pediatric orthopedic fellowship with us. He was a native of Fresno, California, and attended Johns Hopkins for his undergraduate education. He returned to California for medical school at UC Davis, followed by his orthopedic residency at the Carolinas Medical Center in Charlotte, North Carolina. Eric has had a life-long commitment to sports and athletics, which led him to Children's specialists where he is the Chief of Sports Medicine.

Eric's current patient population consists of 60% sports medicine, which includes shoulder, knee, ankle,

wrist and elbow joint injuries sustained through sports or play. Sports medicine patients tend to be adolescents between the ages 14-19, but can include children as young as six years. Depending on the season, these athletes can be actively competing in various sports including swimming, volleyball, tennis, soccer and football.

Eric plans to further develop the Children's Specialists sports medicine program and substantially expand the materials and information that are available to patients and physicians.



Edmonds family



Tamara Zagustin, M.D. **Rehabilitation and Physiatry**

Dr. Zagustin joined Children's Specialists of San Diego and Rady Children's Hospital in January, 2009, as the new division director for Rehabilitation Medicine and Physiatry. She completed a fellowship in physical medicine at the Denver Children's Hospital and comes to us with a plan of expanding a comprehensive team-based approach to children's physiatry and rehabilitation medicine here at Rady Children's Hospital. She is already running multiple clinics, including the General Multidisciplinary Rehab Clinic as well as her very popular Spasticity Clinic, in which she works closely with both Dr. Chambers of orthopedics and Dr. Friedman of neurology. Dr. Zagustin is also involved in the Chronic Pain Clinic and has introduced canine therapy to assist rehab patients during their therapy sessions in the inpatient unit. The orthopedic department is delighted to have Dr. Zagustin as a professional colleague.





*National Ranking
of Orthopedic Program
– Rady Children’s Hospital
– San Diego
August, 2009*

We just learned that the August 2009 U.S. News and World Report Healthcare Issue, which evaluates children’s hospitals, has ranked our orthopedic department as #4 in the United States. The evaluation system was based on an intensive scoring system and evaluation of all aspects of pediatric orthopedic programs, ranging from infection prevention index to quality of nursing, patient and family services, number of specialized clinics, and both inpatient and outpatient surgical volume. Of particular note were the figures related to overall patient volume, (total visits to the hospital in a year’s time – clinics, also admissions) where the Children’s Hospital San Diego’s number of 62,546 was the greatest in the U.S.



Clinical patient care

This high ranking reflects both the quality of clinical care that we give, but in particular, our academic effort. We are able to draw outstanding faculty into our program because of their desire to be involved in a research and development mission to not only care for patients but in addition, provide new treatment methods for children’s orthopedic problems. These staff also enjoy the camaraderie and energy of our teaching program.



Teaching

Our overall success is the result of our unique academic/private care model, which with internal management reflects a nimble, agile, “just in time” management approach that is a national model.



OR excellence

Many people can be thanked for this rating, ranging from hospital administration to our tremendously supportive anesthesia, nursing, intensive care, and radiology departments as well as other services which support our mission.

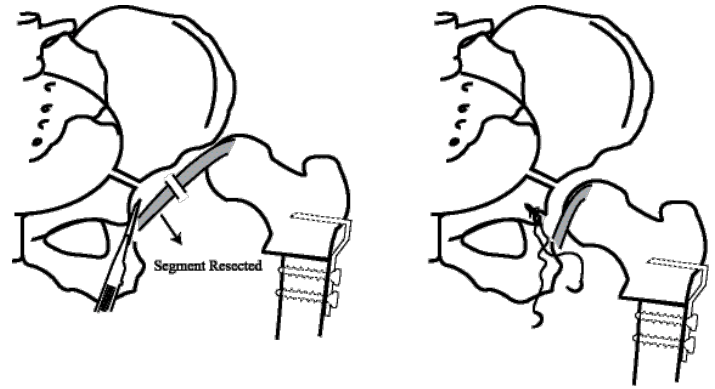
Having outstanding residents from multiple programs, as well as having an internationally ranked fellowship program also helps us. Seeing our large patient volume requires a tremendous effort and unbelievable administrative organization as well as work by our physician assistant/nurse practitioner group. Of special note is our office



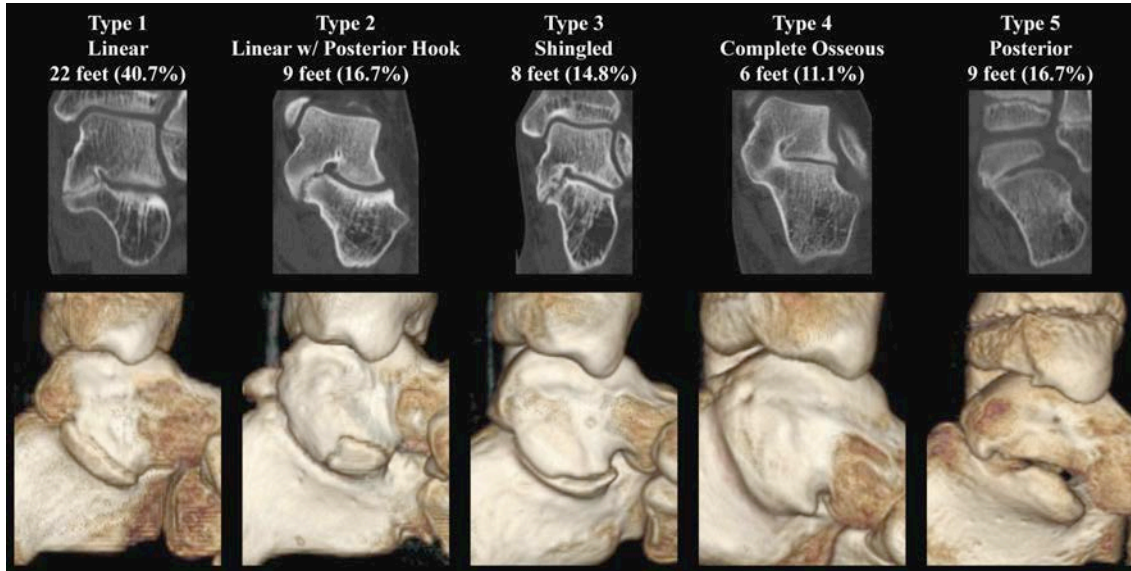
Biomechanics laboratory

staff, which has been selected over many years and rewarded for their outstanding work ethic and dedication to our mission.

We are pleased with this ranking and will continue our effort to improve in every area of patient care, teaching and research.



Lab research applied to clinical problems



Applied research

New Orthopedic Staff Surgeon – July 2009

We are pleased to announce that beginning July 1, 2009, we will have a new orthopedic staff-faculty member, who comes to us from the University of Pennsylvania. Dr. Harish Hosalkar, who is a native of India, completed a residency in India followed by a fellowship in children's orthopedics at the Great Ormond Street Hospital for Children in London. He has just completed an additional residency at the University of Pennsylvania, where he graduated with honors, including being awarded the Outstanding Senior Resident in a Teaching Capacity, as voted by the junior residents.



During his last year at the Penn program he spent three months doing the A-O Muller hip preservation fellowship in Berne, Switzerland. Dr. Hosalkar has a tremendous research interest and has already published 88 papers. His special interest in our program will be to help us expand our hip treatment program, including research related to many hip disorders in childhood.

We look forward to the arrival of Dr. Hosalkar and his wife Hetal, a pediatric anesthesiologist, as well as their son Hriday. The addition of Dr. Hosalkar should allow us to continue our important record as an international contributor to pediatric orthopedic research, presentation and publication effort.

2008-2009 Fellows - Children's Hospital-San Diego



Humberto Guzman, M.D.

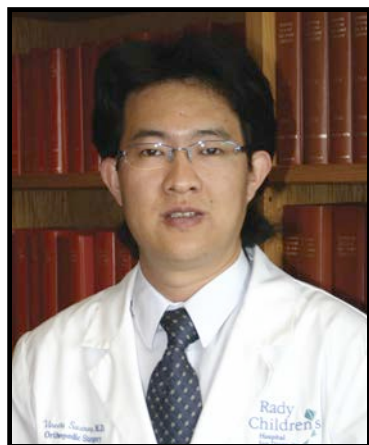
Humberto, born and raised in San Juan, Puerto Rico, completed his undergraduate and medical school education at the University of Puerto Rico, followed by orthopedic residency at the same institution. Research interests include scoliosis as well as evaluation of one vs. two tension band plates (8-plates) in the treatment of genu valgum.

Following his fellowship Dr. Guzman will be joining the academic faculty at the University of Puerto Rico Department of Orthopedics.

Meghan N. Imrie, M.D.

Meghan, a native of San Jose, California, earned her undergraduate degree in chemistry at Yale University followed by medical school at UCSD (where we came to know her during her clerkship at Children's Hospital). She then took her orthopedic residency at Stanford University. Research interests include a study of hip dysplasia in breech babies ("best paper" candidate POSNA – May, 2009) and scoliosis.

Dr. Imrie will return to Stanford University as a staff member in the children's orthopedic division of the Lucille Packard Children's Hospital.



Enbo Wang, M.D.

Dr. Wang will be completing a one year international pediatric orthopedic fellowship in September, 2009. He came to us from the China Medical University in Shengyang, Liaoning Province and has completed a research project on radial head dislocation. He also was a co-author on a scoliosis research project evaluating anterior plus posterior approaches to the spine for scoliosis correction.

Dr. Wang will return to Shengyang where he will be on the full-time academic faculty (children's orthopedics).

2008-2009 Fellows - Children's Hospital-San Diego



Abigail K. Lynn, M.D.

A native of Williamsport, Pennsylvania, Abby received her B.S. from Lehigh University in Bethlehem, PA, and her medical degree from Penn State University College of Medicine. She took her orthopedic residency at Emory University in Atlanta before joining us in San Diego for her fellowship. Research interests include a study in which she compared the value of arthrogram and exam under anesthesia versus MRI to determine initial head shape and containability in Perthes disease.

Dr. Lynn has accepted a pediatric orthopedic faculty position at Mt. Sinai Medical Center in New York City and is excited to begin this new phase of her career.

Alison J. Rozansky, M.D.

Ali grew up in San Diego and went to UCLA for her undergraduate education. She then attended Loma Linda University School of Public Health where she earned a Masters degree, and then headed to the mid-west (Chicago Medical School) for her medical education. Ali's orthopedic residency was taken at the Akron General Medical Center (where prior fellow Mark Adamczyk is on staff). Research interests include a detailed study categorizing talo-calcaneal tarsal coalitions.

Dr. Rozansky is looking forward to practicing in Southern California and has joined a private children's orthopedic group in the San Fernando Valley (Los Angeles area).



Jun Takahashi, M.D., Ph.D.

Dr. Takahashi completed his six-month spine fellowship in early 2009. During his fellowship he completed a scoliosis research project evaluating selective thoracic fusion in adolescent patients.

He has returned to Shinshu University School of Medicine in Nagano, Japan, where he is busy applying the principles and techniques he learned from Dr. Newton here in San Diego.

Arriving Fellows - 2009-2010



Robert Cho, M.D.

Drexel/Hahnemann, Philadelphia



George Gantsoudes, M.D.

Mt. Sinai School of Medicine, NY



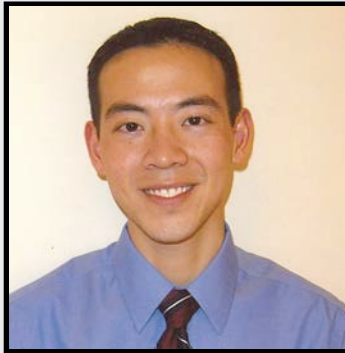
Luis Moraleda Novo, M.D.

Madrid, Spain
(International Fellow)



Robert Lark, M.D.

Duke University, Durham



Raymond Liu, M.D.

Case Western Reserve, Cleveland



Takashi Ono, M.D.

Tokyo, Japan
(International Fellow)

Future Fellows (2010-2011 Academic Year)

Eric Eisner, M.D.

University of Texas Southwestern

Nirav Pandya, M.D.

University of Pennsylvania

Ryan Ilgenfritz, M.D.

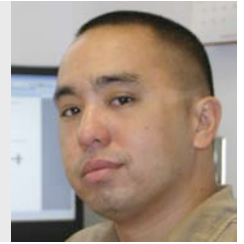
University of Iowa

Hilton Gottschalk, M.D.

University of Texas Southwestern

Orthopedic Biomechanics Research Center

Arnel Aguinaldo, MA, ATC
Director, Center for Human Performance &
Orthopedic Biomechanics Research Center



The Orthopedic Biomechanics Research Center (OBRC) at Rady Children's Hospital-San Diego was founded in November of 1998 with an initial research focus towards adolescent idiopathic scoliosis. Adolescent spinal deformity remains the major focus of the facility for evaluating varying types of materials and dimensions for spinal fusion, while also analyzing potential fusionless scoliosis correction constructs. However, significant efforts have also been made toward understanding the biomechanical effects of various surgical techniques for stabilizing adolescent fractures of the humerus, femur and tibia, as well as exploring the biomechanical effects of pediatric hip deformity.

The OBRC retains a close collaborative research effort with local institutions such as the Department of Orthopedic Surgery at the University of California San Diego and the US Naval Medical Center. Spinal research in the areas of adult deformity, spinal trauma and vertebroplasty/kyphoplasty comprise the largest component to this collaboration. However, biomechanical research is also being conducted to evaluate novel devices and materials for sports medicine applications such as ACL repair and femoral fracture fixation techniques. Research has also been established in the area of foot and ankle orthopedics to evaluate mobility associated with surgical techniques used to correct bunions and bunionettes.

These cumulative research efforts have been accomplished by teaming orthopedic surgeons and biomedical engineers with orthopedic residents and fellows. In addition, the OBRC maintains a strong teaching component as part of its diverse skill set. Undergraduate interns and medical students, as well as orthopedic residents and fellows, are directly involved in designing and developing research projects. This multi-layered approach has yielded significant publication success with manuscripts appearing in *Spine*, *Journal of Pediatric Orthopaedics*, *Clinical Orthopaedics and Related Research*, *American Journal*

of Sports Medicine, *Journal of Shoulder and Elbow Surgery*, *Medicine and Science in Sports and Exercise*, *Journal of Foot and Ankle Surgery*, *Arthroscopy* and the *Journal of Applied Biomechanics*.

The future is bright for the OBRC as it establishes itself as an internationally recognized academic center that develops innovative ideas for the treatment of orthopedic disorders in childhood and young adults.

New Director of the Orthopedic Biomechanics Laboratory – Summer - 2009

Diana Glaser, Ph.D., who has just completed her Ph.D. at the University of Tennessee in Biomedical Engineering, will join the Children's Hospital orthopedic research team as the Director of the Biomechanics Laboratory beginning August 1, 2009. In addition to her Ph.D. Dr. Glaser has had extensive experience in industrial development project management and university research. Originally from Germany, she is now a permanent U.S. resident who in addition to her biomedical skills, is fluent in writing, reading and communicating in not only English, but also German and Bulgarian. Dr. Glaser has expertise in 3-D modeling as well as motion analysis and also has significant expertise in modeling research aspects of total hip arthroplasty as well as other hip conditions.

We look forward to what will be an ideal collaboration between orthopedics and biomedical engineering and biomechanics research.



Notes from the Research Team

Tracy Bastrom, MA – Orthopedic Research Program Manager

Our team had a very productive year, with 26 publications in peer reviewed journals. Our 2007-2008 fellows finished off an extremely successful year, with multiple 2008 POSNA meeting presentations.

Eric Edmonds assisted with multiple projects, including the evaluation of outcomes of surgical intervention for anterolateral ankle impingement in adolescents (with Dr. Chambers). He also worked with Dr. Chambers to complete a study on extra-articular drilling for osteochondritis dissecans of the patella.

Patrick Henderson started his year off working with Dr. Wenger and Dr. Mubarak to evaluate their series of patients who underwent ligamentum teres maintenance and transfer in open reduction for hip dislocation. This work was presented at POSNA in 2008 and was published in the June 2008 issue of the Journal of Children's Orthopedics.

John Schlechter initially focused his energy on a project with Dr. Chambers, evaluating the outcome of distal rectus femoris transfer in cerebral palsy patients

(using data from the gait lab). This project was presented as a poster at POSNA in 2008. Subsequently, he worked closely with Dr. Newton and Vid Upasani, MD on two spine projects – one evaluating the predictors of curve add on below a spinal fusion (presented at the 2008 SRS meeting and the 2009 POSNA meeting) and the other an analysis of upper instrumented vertebra and pulmonary function.

Vineeta Swaroop completed a comprehensive review of our DDH patients which was presented at POSNA in 2008 and is in the April/May 2009 issue of JPO. Subsequently, Vineeta helped Dr. Mubarak write up his series of talonavicular fusions for dorsal subluxations in clubfoot, which was presented in Boston at POSNA (2009) and recently published.

We have four very hard working fellows this year. They did an amazing job at our Visiting Professor program and three projects (two podium, one poster – similar to the 08-09 year) were presented at the 2009 POSNA meeting in Boston. I look forward to detailing their efforts in next years newsletter

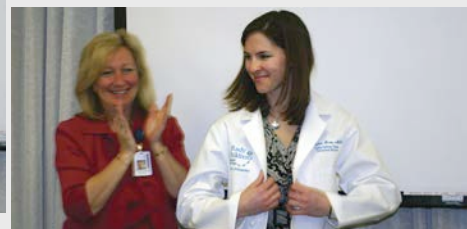
As usual, our team is growing! We have a great group of people, and without them abstracts could never be ready for submission during the first three months of fellowship.

One of our research associates, Vanessa Scott, was accepted to medical school and will be leaving us in July to start her first year at Albert Einstein in New York. She was instrumental in getting two of our fellows' projects completed, plus has helped Dr. Yaszay with a study on scoliosis in cerebral palsy patients. While we will miss her here, we wish Vanessa the best for her career in medicine.



Vanessa Scott, Valerie Ugrinow, Molly Moor, Eric Varley, DO
Orthopedic Research Team

Lena Sefton Clark Endowed Fellowship in Pediatric Orthopedics



Dr. Imrie accepting the Lena Sefton Clark symbolic “white coat” from Kathleen Sellick, CEO of RCHSD.

The legacy of Lena Sefton Clark is reaching far beyond the century mark.

Mrs. Clark built a strong foundation for our hospital philanthropy through the annual Charity Ball, now a century old. In 2007 her family created the Lena Sefton Clark Endowed Fellowship in Pediatric Orthopedics to keep her ideals alive.

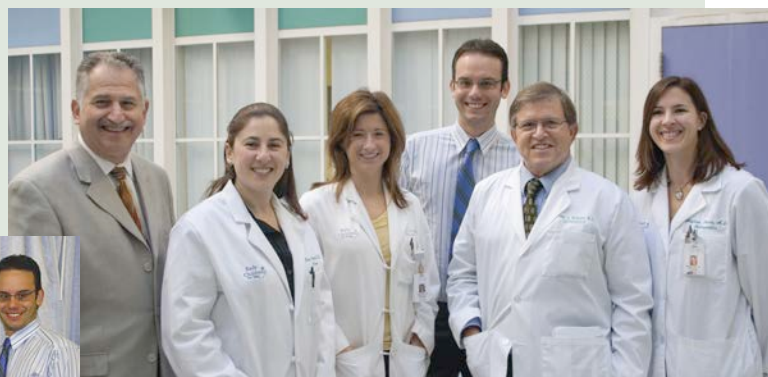
The endowment creates a perpetual source of funding to support education, training and research for generations of physicians to come – and the countless children they will care for. That generational reach is especially true for this year’s fellowship awardee, Dr. Meghan N. Imrie.

Dr. Imrie, a Bay area native, had her medical education at the University of California-San Diego Medical

School and then her orthopedic residency at Stanford University, following her father and grandfather into the field of orthopedics.

Passionate about medicine, Dr. Imrie worked her way up the hospital hierarchy by starting as an orderly mopping floors and transporting patients. That was in between training as a competitive gymnast, a sport she continued to compete in while completing her undergraduate degree at Yale.

Dr. Imrie’s research includes investigation of dysplasia in breech birth babies and ACL reconstruction in adolescents. More importantly, Dr. Imrie’s work ethic and faultless attention to detail, not only in patient care but in preparing for conferences, exemplifies the ideal pediatric orthopedic fellow.



Mid-Career Life in Children's Orthopedics

We currently have eight (soon to be nine) orthopedic staff in the Rady Children's Hospital-University of California San Diego program. In a broad sense our staff are divided into three categories -- beginning with the senior staff (Mubarak and Wenger) whose careers and reputations are attached to the development of the program. Our future is based on a second "mid-career" segment of our orthopedic teaching staff (broadly defined as having 10-15 years of practice, teaching and research experience).

This group is followed (and energized by) a dynamic group of younger staff who are beginning their pediatric orthopedic careers. This newsletter segment describes the incredibly busy lives of two of our "mid-career" staff.

Dr. Henry G. (Hank) Chambers

Hank was born in Colorado, graduating from the University of Colorado (Boulder) followed by medical school at Tulane (New Orleans) and residency in the Brooke Army Hospital program (San Antonio) where he received the Commander's Award for Outstanding Research. He then came to Children's Hospital San Diego for his fellowship, partially because of his deep personal interest in cerebral palsy and motion analysis where he was greatly influenced by Dr. David Sutherland, founder of our Motion Analysis Laboratory. After a short period of staff experience back in San Antonio, we recruited Hank to San Diego where he then assumed the directorship of our Motion Analysis Laboratory upon Dr. Sutherland's retirement.

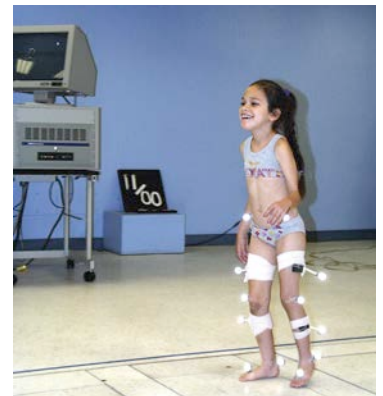
Hank brings an immense variety of skills to his current position on our staff. In addition to serving as Director of the Motion Lab he also directs our sports medicine program (CHAMPS – Children's Health Athletic Medicine and Performance in Sports). In addition he has a strong interest in medical leadership and has served as Chief of Staff at Rady Children's Hospital, which included serving on the Board of Directors of Children's Hospital. Further Rady Children's Hospital leadership activities include chairing the Credentials



Committee and leading the Motion Analysis Laboratory Advisory Board. He recently co-chaired the Miracle Foundation, an annual fundraiser for Children's Hospital held in a large downtown hotel, which raises hundreds of thousands of dollars in support for our hospital. He also has been a key fund raiser for the Cerebral Palsy Foundation and serves on their San Diego board.

Hank works closely with Children's Hospital administration in developing new programs, recently initiating the Southern California Cerebral Palsy Center at Rady Children's Hospital to provide comprehensive cerebral palsy care.

His congenial, inclusive personality has led to many national leadership positions including his current role as President of the American Academy of Cerebral Palsy and Developmental Medicine. This position involves travel throughout the world, including visiting lectureships in Israel, Australia, and other centers, which further establishes our international reputation. Dr. Chambers was also recently elected to the Board of Directors of POSNA. Further leadership responsibilities include serving as Chairman of the Gait Analysis committee of POSNA, as well as working on the POSNA Evidence Analysis Work Group.



His research covers many areas including cerebral palsy, muscle anatomy and physiology, spasticity, sports medicine and the development of new methods for treating osteochondritis dissecans.

Hank's family life includes his wife Jill and son Sean here in San Diego, and Reid, a graduate (soon to be medical) student in Chicago.

Dr. Peter O. Newton

Peter attended undergraduate school at UCSD followed by medical school at Texas Southwestern in Dallas, residency at UCSD, and a pediatric orthopedic fellowship at the Texas Scottish Rite Hospital in Dallas. During his residency here he demonstrated a unique combination of skills, including an engineering interest, advanced surgical skills, and a personality that encouraged camaraderie. During his fellowship in Dallas we actively recruited Peter (against stiff competition) and fortunately he joined our faculty in 1994 and began his career. Upon arrival he committed himself to 1) developing the technical skills for complex spinal deformity correction; 2) developing research skills to advance the field of pediatric spinal deformity; and 3) developing leadership skills.

Since joining our staff, Peter has rapidly risen to national and international prominence due to his clinical and research skills in scoliosis, including the development of new techniques and implants that have greatly improved our ability to correct scoliosis. In addition to being an expert clinician and skilled surgeon he has proven to be an exceptional administrator. One sometimes fails to realize just how busy a mid-career academic track surgeon is. In addition to a full patient care schedule, Peter is director of our scoliosis service and also directs our incredibly productive research program, which includes the biomechanics laboratory, the animal laboratory (in affiliation with UCSD) and our clinical outcomes studies.

He currently serves as Chief of Surgery at Rady Children's Hospital and as a Board member of Children's Specialists-San Diego. He is the principal investigator of the Harms Study Group, coordinating the 15 sites which are administered through a San Diego base. This has led to dozens of important publications. He also serves as a mentor for the UCSD research resident who spends a full year in our Children's campus laboratories.



National commitments include serving as treasurer of the Pediatric Orthopedic Society of North America (POSNA), board member of the Scoliosis Research Society (serving as Research Council Chair) and Program Chair for the September, 2009, SRS meeting (San Antonio). Scoliosis activities include a strong commitment to the DePuy spine education program, serving as the scoliosis education meeting chair, sponsoring live spine surgery education tutorials here in San Diego, chairing the peer-to-peer scoliosis meeting group and organizing the spine deformity cadaver course.

Ongoing research projects include an extensive annual research program that focuses on developing non-fusion research methods for scoliosis correction including tethering of spinal growth centers. Peter also leads our participation in the BRAIST, NIH-sponsored prospective bracing trial.

In addition to this incredible work schedule, Dr. Newton is a committed husband to his wife Cathy and father to his children Alison, Kira and Walker.

Every organization has a sense of balance and benefits by the variety of skills of its members. Although quite different in many ways, Dr. Newton and Dr. Chambers each bring a unique skill set and level of energy which promises to lead our program toward a strong academic and scientific future.

Both Dr. Chambers' and Newton's commitment to clinical and scientific excellence confirms Freud's view that a successful life consists of love and work. A happy, dedicated professional does not need to consider the work part very specifically because love not only extends to family and friends but also to one's everyday life at "the hospital". – DRW



Michelle Marks – Harms Study Group Research Coordinator (in Tucson office)





36th Annual David H. Sutherland Visiting Professorship

Michael K. D. Benson, MA, MBBS, FRCS
Nuffield Orthopedic Center
Oxford University – Oxford, England

Mr. Benson graduated from St. Mary’s Hospital in London and worked at the Middlesex and Royal National Orthopaedic Hospitals before undertaking a prestigious fellowship at the University of California Los Angeles. He then returned to the UK and was appointed as Consultant in Orthopaedic Surgery with a special interest in children’s orthopaedics at the Nuffield Orthopaedic Centre in September 1977.

He has served as president of a number of key orthopaedic associations and societies, including the British Society of Children’s Orthopaedic Surgery, the European Pediatric Orthopaedic Society, and the British Orthopaedic Association. He also serves as President of the International Girdlestone Orthopaedic Society.

Mr. Benson has published over 70 peer reviewed scientific papers and authored or co-authored several books, including “Orthopaedics - The Principles and Practice of Musculoskeletal Surgery” and “Children’s Orthopaedics and Fractures”.



2008-2009 Fellows and Dr. Wenger



Mr. Benson and the current RCHSD – University of California - San Diego pediatric orthopedic staff



Fellows plus a very cheerful Mr. Benson

Visiting Professor – 2009

Photographs from Western Orthopedic Association – Rady Children’s Hospital Orthopedic Department evening dinner – UCSD faculty club on April 23, 2009.



Research associates
Vanessa Scott, Valerie Ugrinow,
Molly Moor, Eric Varley



Mr. and Mrs Benson, Kathy Wenger, and
Scott Mubarak



Burt Yaszay, Peter Newton, Shyam
Kishan (former fellow)

Visiting Professor Notes

The 36th Annual David H. Sutherland Pediatric Orthopedic Visiting Professorship, held on April 23-24, 2009, was a fantastic success. Mr. Michael Benson of Oxford University proved to be a brilliant visiting professor. He gave multiple excellent presentations and his evening Western Orthopedic Association dinner talk entitled “Orthopedic Humours” was one of the best histories of orthopedic surgery that we have ever heard.

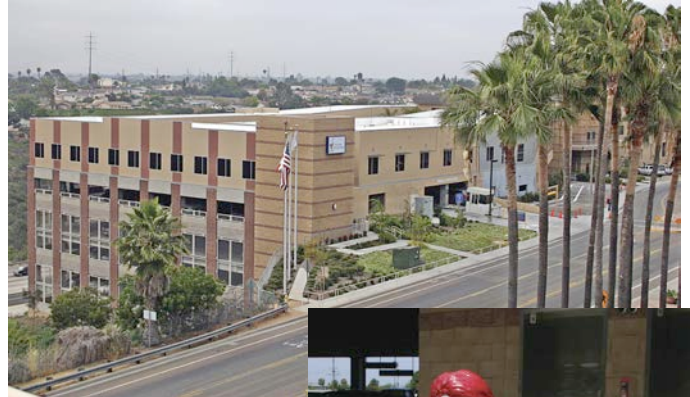
Mr. Benson was able to comment on all of our clinical and research papers and was extremely knowledgeable in every area of children’s orthopedics. He even had comments on the scoliosis papers and the laboratory testing papers from the biomechanics lab related to scoliosis, although he does not treat the condition.

Our visiting professorship continues the long tradition of having the best known children’s orthopedists in the world come to San Diego and for us to share philosophies with them. We learn a great deal and it helps our program to remain balanced.

We also wish to announce that the 2010 Visiting Professor has already been selected and it will be Dr. Joe Hyndman, a well known children’s orthopedic surgeon from Halifax, Nova Scotia. The dates will be April 22-23, 2010 and we look forward to many of our alumni attending this event.

New Construction at Rady Children's Hospital - San Diego

Rady Children's Hospital is planning for the future with a new 279,000 square foot Patient Care building. The \$350 million Pavilion will include 16 new state-of-the-art operating rooms, with the latest technology to conduct pediatric surgeries. The facility will include private patient rooms, outfitted with foldout sofa beds, Internet connections, and other amenities that will allow parents to be closer to their children. The Patient Care Pavilion, due to be completed in 2010, will be environmentally friendly with "green" technology and will be one of the only Leadership in Energy and Environmental Design (LEED) certified hospital buildings in California.



Construction well underway
May 2009 (view to south from orthopedic office)



The new parking garage was opened in Dec 2007 and provided many new and larger spaces. The new Ronald McDonald house was added on top and will open in June 2009 (view to south from orthopedics office).



Architects projection - New Rady Children's Hospital - San Diego (to open mid 2010)

Connections – Images from the Orthopedic Program

Alumni Reunion

Pediatric Orthopedic Society of North America (POSNA) meeting, Boston – May 2009

* Former fellow



Christine Caltoum* (Indianapolis),
Tracey Bastrom (San Diego),
E. Edmonds* (San Diego),
Patrick Henderson* (Tucson)



D. Wenger (San Diego),
Tracey Bastrom (research coordinator)
S. Mubarak (San Diego)



D. Wenger (San Diego),
Lynn Manheim, CPNP (San Diego),
Mary Lou Scott, CPNP (San Diego),
P. Newton (San Diego)



D. Wenger (San Diego),
Shyam Kishan* (Loma Linda)
Steve Frick* (Carolinas Medical Center)



Humberto Guzman (current fellow),
Tamir Bloom* (Newark),
D. Wenger (San Diego),
Arjandas Mahadev* (Singapore)



Vaneeta Swaroop* (Chicago),
D. Wenger (San Diego),
Meghan Imrie (current fellow)



Sandy Mubarak,
Mr. James Kock, CEO of Samuel Adams Co.
– presidential guest speaker at POSNA,
S. Mubarak (San Diego)

Other Images – POSNA Boston



John Schelecter* (Orange County)
Professor John Dubousset (Paris)
Vaneeta Swaroop* (Chicago)



Dr. Jean Dubousset and wife Anne with the
Mubaraks. Dr. Dubousset is perhaps the
world's best know scoliosis surgeon – a
former visiting professor here in San Diego,
and a member of the French
Legion of Honor



S. Mubarak (San Diego),
D. Wenger (San Diego),
Dr. Ismat Ghanem - (Beirut, Lebanon)

* Former fellow

Complex Cases at Rady Children's Hospital - San Diego Development of New Surgical Methods

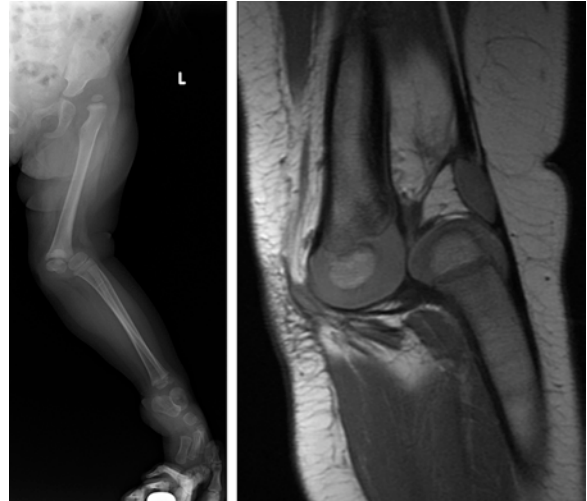
Our institution is known for analyzing, developing and applying new methods to complex children's orthopedic problems. Often these are improved operations developed by our orthopedic staff and in other cases we adopt methods developed in other centers.

The patient presented in this year's issue is a beautiful 14 month old Chinese girl who was the second adopted child of one of our families (we had previously treated a sibling with a different orthopedic problem). The family called us prior to receiving the child and reported that the child had both a dislocated knee and likely a dislocated hip, but was otherwise healthy. They asked whether we would be able to treat the problems and of course we said yes.

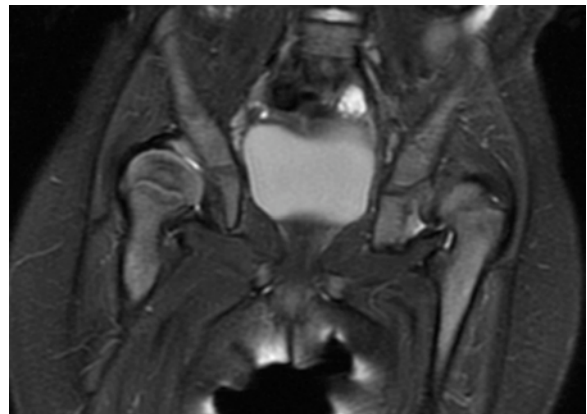
Upon arrival we found the child to be a vivacious, well-nourished Chinese girl whose problem was a very deformed left lower extremity with a severe congenital knee dislocation. In addition, x-rays showed a dislocated left hip. Previous attempts at treatment in China had included casting and splinting of the deformed knee.

We proposed surgical treatment of both the dislocated hip and knee, beginning with the knee. Due to the risk of severe scarring and quadriceps weakness that can follow traditional V-Y plasty, we had to consider alternative methods

One of our staff, who is a member of the International Pediatric Orthopedic Think Tank, recalled that Dr. Charles Johnston of Dallas, Texas (one of the fellows that Dr. Dennis Wenger had previously trained in Dallas) had presented a new method for treating severe knee dislocation utilizing distal femoral shortening at a prior IPOTT meeting. This concept is similar to that used for treating severe dislocations of the hip, but with the knee includes complex posterior capsule imbrication and possible cruciate ligament reconstruction. The technique has not yet been published in a journal but had just appeared in a textbook chapter.



Severe congenital knee dislocation



Child also had complete hip dislocation

After consulting with Dr. Johnson we took the child to the operating room for this complex procedure which included a long anterolateral knee incision, as well as a posteromedial incision for capsular imbrication (posterior). The quadriceps mechanism was spared. An A-O mandibular plate, which provides compression, allowed the femur to be shortened by 2 cm. The capsule was released and the knee freed, with it eventually being flexed to 90 degrees.

A very atretic anterior cruciate ligament remained, therefore the cruciate ligament component of the procedure was not performed. A separate posterior-medial incision as well as the lateral incision allowed posterior capsular reefing or capsulorrhaphy. The final difficulty included flexing the knee, since in this condition the patellar ligament (patellar tendon to some) was extremely short, requiring Z-lengthening and reinforcement to allow knee flexion of 90 degrees.

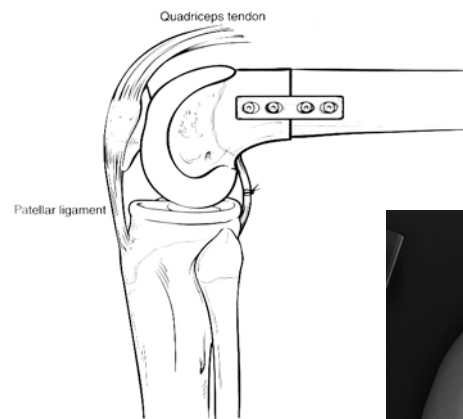
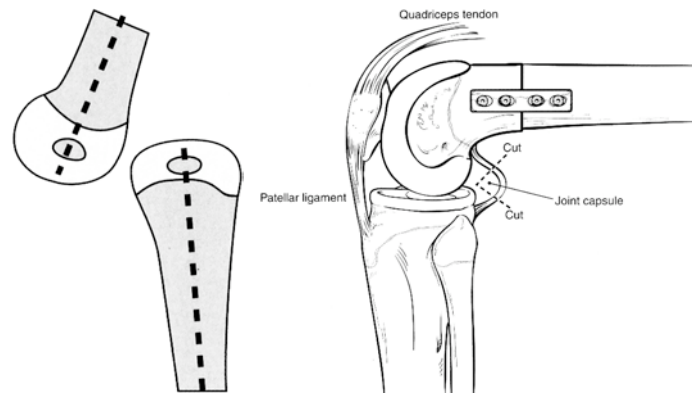
The child was then treated with serial casting in both flexion and extension and eventually placed in a hip, knee, ankle-foot orthosis with gradual freeing of the hinged knee. The hip will be treated by open reduction, femoral shortening, capsulorrhaphy, and acetabuloplasty in six months.

The patient is making excellent progress with good early knee motion and quadriceps strength, which is much better than one would achieve after V-Y plasty of the quadriceps. After the proposed hip surgery the child will have femoral shortening at both ends of the femur, all done before two years of life!

This patient exemplifies why children come from throughout the world for treatment in the orthopedic department at Rady Children's Hospital San Diego. Our application of innovative care by staff with great experience who can make the adjustments required to apply very complex treatment methods, helps to assure our reputation as an international referral center for children's orthopedics.

28 Congenital Knee Dislocation

Charles E. Johnston, II



(reproduced from Tolo, V., and Skaggs, D. – Master Techniques in Orthopedic Surgery – Pediatrics)



Notes From a Former Fellow

Kevin G. Shea, M.D. – Boise, Idaho
(1997-1998)

My interest in health care came from my parents, since my mother was an RN (her father was one of the first physicians in South Dakota) and my father was an anesthesiologist. His work ethic, honesty, and commitment to patients have been a great example for me. I attended Notre Dame, studying biology and philosophy, and was a resident advisor in a dorm that was modified for students with cerebral palsy. This experience influenced my decision to pursue pediatric orthopedics.

As a student at UCLA I worked in the Baltics during the initial breakup of the USSR, and Soviet tanks were sent to these areas to quell the unrest. I was struck by the physician commitment to patient care that superseded the problems of limited supplies and poor working conditions. My work abroad (Europe, Central/South America) has provided a perspective which transcends nationality and geography.

I did my orthopedic residency at the University of Utah. The pediatric orthopedic and sports medicine experience directed me on my career path. Dr. Bob Burks' commitment to sports medicine research and exacting surgical technique continues to have a significant impact on my practice. Working with Dr. Sherman Coleman was one of the great treasures of my training because of his humility and love of pathology and orthopedic history.

The challenge of my pediatric fellowship started with my interview with Dr. Wenger – his questions and insights into the human condition continue to fascinate me. Drs. Mubarak and Wenger were committed to creating the best fellowship educational experience possible, and this year was one of the most intense and rewarding in my life. Dr. Mubarak's examples of compassion, ethics, and excellence continue to guide me.

Dr. Wenger's combined interest in history and his ability to think outside the constraints of contemporary practice never stops. I spent many afternoons reviewing gait studies with Dr. Sutherland, whose gentle kindness and teaching style impacted many patients and students. Dr. Chambers' commitment to neuromuscular disease and his non-medical perspective about this disease was impressive. Dr. Newton's intense focus on spinal deformity has changed the field, and his 'bed side manner' is exceptional. Dr. Wallace was a young mentor, providing me sound advice about beginning my practice. The CHSD staff remain friends to this day, and I am grateful for the professional opportunities they have provided.

The camaraderie with my other fellows, Steve Frick (North Carolina), Neal McNearney (Florida), and Eduardo Segal (Argentina) was another positive for the year, and I remain in touch with each of them. The fellows and students taught each other by sharing their pearls of wisdom, gleaned from their own institutions and fellowship mentors.

I joined Buzz Showalter in Boise in the fall of 1998, and Howard King joined us in 2001, providing us with his extensive background in spinal deformity. We have worked to create outreach clinics to cover rural areas, including Eastern Idaho and Montana. My practice has evolved with a significant emphasis upon pediatric/adolescent sports medicine. Although my primary focus is pediatrics and sports, my practice includes adult patients with knee injuries (ligament, cartilage reconstruction), trauma, Ilizarov, and osteomyelitis. I cover high school athletic programs, the College of Idaho, and the US Ski Team.

My life in Boise has been filled with some challenges, especially one of creating an academic environment in

a non-academic setting. I have worked with many talented grad/undergrad students, and Drs. Pfeiffer and Sabick at Boise State. These collaborations have led to the development of the Center for Orthopaedics and Biomechanics Research. The research from this lab has evaluated jump/landing mechanics in young athletes, clinical tests for shoulder labral pathology, shoe-turf interactions for the NFL, anatomy and epidemiology of knee injury. My work at Boise State includes sponsoring a graduate student fellowship in biomechanics, serving on thesis committees, and engaging undergraduates and high school students in research projects. We are currently adapting the research lab for gait studies. In conjunction with Dr. Chambers and several other centers, we are working to create a multi-center research group for Osteochondritis Dissecans.

The quality of life in Boise and the intermountain west is remarkable – the outdoor options provide many family adventures and diversions from work. My wife Lonnie and two children provide support, understanding and friendship.

My pediatric fellowship has had a great impact on my career, and the experience at CHSD was much more



than I had expected. The clinical experience was broad and deep. I was given a solid foundation for evaluating complex and unfamiliar patient problems, and this foundation continues to support me. On a daily basis I am guided by the experiences of my fellowship and the ethical examples of my fellowship mentors. I quote them with regularity and if imitation is the most sincere form of flattery, my pediatric orthopedic teachers should be honored.

“The most important thing is to not stop questioning... Truth is what stands the test of experience”

Albert Einstein

Wedding in Chicago

August was a happy time for 2007/08 fellow Vineeta Swaroop, who was married on August 30, 2008, to Chris Jaeger at the St. John Neumann Church in St. Charles, IL (near Chicago). We wish Chris and Vineeta the best in their future careers and in their life together.

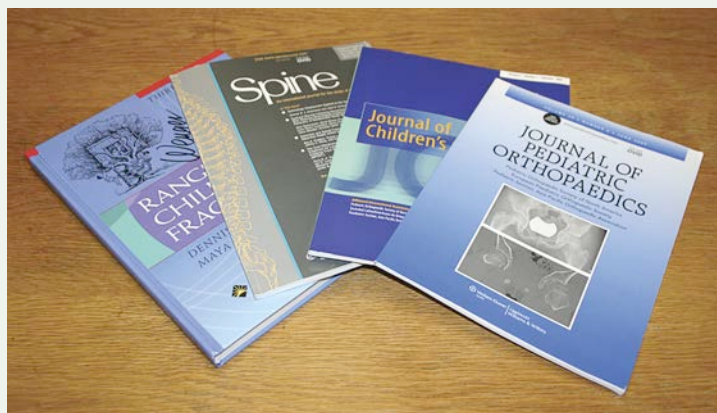
Vineeta is now a pediatric orthopedic surgeon at both the Children’s Memorial Hospital of Chicago and the Rehabilitation Institute of Chicago. Since Vineeta grew up in the Chicago area and had her residency at Northwestern, she now has achieved a life-long goal of settling into a busy, happy life in Chicago.



The happy bride and groom

Documentation (Our Publications)

Our progress as a center directed to the future mandates both research and publications that document our work. We continue as one of the top children's hospitals in the world for publications in the orthopedic literature.



Publications – July, 2007 through December, 2008

Adamczyk MJ, Odell T, Oka R, Mahar AT, Pring ME, Lalonde FD, Wenger DR: Biomechanical stability of bioabsorbable screws for fixation of acetabular osteotomies. J Pediatr Orthop, 27:314-8, 2007.

This study compared the biomechanical stability of triple innominate osteotomies fixed with either bioabsorbable or stainless steel screws. Bioabsorbable screws behave similarly to steel screws when stabilizing triple innominate osteotomies and would have the advantage of not requiring a second surgery for screw removal.

Aguinaldo AL, Buttermore J, Chambers H: Effects of upper trunk rotation on shoulder joint torque among baseball pitchers of various levels. J Appl Biomech, 23:42-51, 2007.

High rotational torques during baseball pitching are believed to be linked to most overuse injuries at the shoulder. This study investigated the effects of trunk rotation on shoulder rotational torques during pitching. Results suggest that a specific pattern in throwing can be utilized to increase the efficiency of the pitch, which would allow a player to improve performance with decreased risk of overuse injury.

Baitner AC, Perry A, Lalonde FD, Bastrom TP, Pawelek J, Newton PO: The healing forearm fracture: a matched comparison of forearm refractures. J Pediatr Orthop, 27:743-7, 2007.

Although forearm fractures in children usually heal rapidly after closed treatment, recent studies report forearm refracture rates of 5%. The purpose of this study was to identify risk factors for refracture based on radiographic variables. Conclusions: proximal and middle one third forearm fractures are at greater risk of refracture compared with distal one third forearm fractures. There was a trend toward incomplete healing seen more commonly in those that refractured, emphasizing the importance of longer immobilization in these fractures.

Berrin SJ, Malcarne VL, Varni JW, Burwinkle TM, Sherman SA, Artavia K, Chambers HG: Pain, fatigue, and school functioning in children with cerebral palsy: a path-analytic model.

J Pediatr Psychol, 32:330-7, 2007.

This study tests a model of how pain and fatigue, independently or in combination, relate to school functioning in pediatric cerebral palsy (CP). Conclusions: Pain and fatigue represent potentially modifiable targets for interventions designed to improve school functioning in children with CP.

Bode KS, Newton PO: Pediatric nonaccidental trauma thoracolumbar fracture-dislocation: posterior spinal fusion with pedicle screw fixation in an 8-month-old boy. Spine, 32:E388-93, 2007.

Case report of pedicle screw fixation in an infant with nonaccidental spine trauma. Pedicle screw fixation can be used in infants with unstable traumatic spinal injuries, allowing earlier rehabilitation and return to normal activity level.

Goodwin R, Mahar AT, Oka R, Steinman S, Newton PO: Biomechanical evaluation of retrograde intramedullary stabilization for femoral fractures: the effect of fracture level. J Pediatr Orthop, 27:873-6, 2007.

Retrograde stabilization of mid-diaphysis adolescent femur fractures has shown excellent biomechanical stability. However, it is unclear whether adequate stability is maintained for distal femur fractures using the retrograde approach compared with the clinically recommended antegrade approach. Conclusions: For maximum stabilization of a distal femur fracture, c- and s-shaped nails placed in the antegrade position is suggested.

Goodwin RC, Mahar A, Wedemeyer M, Wenger D: Abductor length alterations in hips with SCFE deformity. Clin Orthop Relat Res, 454:163-8, 2007.

Proximal femoral osteotomy may improve clinical outcomes in patients with residual deformity after slipped capital femoral epiphysis. Whether this procedure improves abductor mechanics is not well established. There were fewer differences in abductor lengths after femoral neck base osteotomies than after subtrochanteric osteotomies. The femoral neck base osteotomy approximated normal abductor lengths more closely than the subtrochanteric osteotomy.

Goodwin RC, Mahar AT, Oswald TS, Wenger DR: Screw head impingement after in situ fixation in moderate and severe slipped capital femoral epiphysis. J Pediatr Orthop, 27:319-25, 2007.

In situ stabilization remains the standard of care in the treatment of stable slipped capital femoral epiphysis (SCFE). Screw placement perpendicular to the physis has shown satisfactory results with minimal complications, however a prominent screw head may produce femoral acetabular impingement and pain after in situ. Alternative in situ fixation techniques may decrease the rate of screw head **impingement in moderate and severe SCFEs.**

Jouve JL, Kohler R, Mubarak SJ, Nelson SC, Dohin B, Bollini G: Focal fibrocartilaginous dysplasia ("fibrous periosteal inclusion"): an additional series of eleven cases and literature review. J Pediatr Orthop, 27:75-84, 2007.

Focal fibrocartilaginous dysplasia (FFCD) is a benign condition first described in 1985 as a cause of tibia vara. We are reporting on 11 cases. The lesions involved proximal tibia (9 cases), distal femur (1 case), and distal ulna (1 case). We believe that this entity represents a bony anchor preventing natural sliding of the periosteum during growth (an "epiphysiodesis-like" effect). For the tibia, we believe this is the pes anserinus. We are suggesting that this entity be called a "fibrous periosteal inclusion." In tibial lesions, if the deformity worsens, early curettage will be followed by rapid correction into physiological valgus (tibia) and prevent the need for osteotomy.

Kishan S, Bastrom T, Betz RR, Lenke LG, Lowe TG, Clements D, D'Andrea L, Sucato DJ, Newton PO: Thoracoscopic scoliosis surgery affects pulmonary function less than thoracotomy at 2 years postsurgery. Spine, 32:453-8, 2007.

Prospective evaluation of pulmonary function before and 2 years after surgery following anterior scoliosis instrumentation to determine if thoracoscopic anterior scoliosis correction with instrumentation affected pulmonary function less than open thoracotomy approaches at 2 years follow-up. Conclusions: This study shows a clear advantage to the minimally invasive thoracoscopic approach with regards to pulmonary function when compared with the open thoracotomy approaches

Lonner BS, Newton P, Betz R, Scharf C, O'Brien M, Sponseller P, Lenke L, Crawford A, Lowe T, Letko L, Harms J, Shufflebarger H: Operative management of Scheuermann's kyphosis in 78 patients: radiographic outcomes, complications, and technique. Spine, 32:2644-52, 2007.

A retrospective multicenter review of 78 patients with Scheuermann's kyphosis treated operatively was conducted. The purpose of the study was to evaluate correction of sagittal alignment, maintenance of correction, and occurrence of, and etiologic factors associated with, junctional kyphosis in patients managed operatively for Scheuermann's kyphosis. This is one of the largest reported series of Scheuermann's kyphosis treated operatively to our knowledge. A high rate of junctional kyphosis, especially at the proximal end, is associated with surgery for Scheuermann's kyphosis using current techniques. Loss of correction is less in patients undergoing combined anteroposterior

surgery. Pelvic incidence correlates directly with lordosis but not kyphosis.

Mahar AT, Duncan D, Oka R, Lowry A, Gillingham B, Chambers H: Biomechanical comparison of four different fixation techniques for pediatric tibial eminence avulsion fractures. J Pediatr Orthop, 28:159-62, 2008.

Several methods have been used to repair tibial eminence avulsion fractures. The purpose of this study was to compare the biomechanical stability of tibial eminence avulsion fractures using suture, resorbable screw, resorbable nail, and metal screw techniques. Conclusions: Increased fracture separation for sutures and resorbable screw groups indicates a potential loss in reduction during cyclic, physiologic loads. There was not a clear biomechanical advantage to performing any particular fixation method in this study. This suggests that the surgeon can use their clinical judgment and experience to determine the fixation technique.

Marks M, Petcharaporn M, Betz RR, Clements D, Lenke L, Newton PO: Outcomes of surgical treatment in male versus female adolescent idiopathic scoliosis patients. Spine, 32:544-9, 2007.

This research was part of a multicenter study of the surgical treatment of adolescent idiopathic scoliosis (AIS) to compare the radiographic and perioperative surgical treatment outcomes of male AIS patients with female AIS patients. Conclusion: Male AIS patients had slightly more rigid primary curves compared to females but a similar degree of postoperative scoliosis correction.

Miyanji F, Mahar A, Oka R, Pring M, Wenger D: Biomechanical comparison of fully and partially threaded screws for fixation of slipped capital femoral epiphysis. J Pediatr Orthop, 28:49-52, 2008.

Previous data have shown that an equal number of threads on each side of the physis maximizes stability for slipped capital femoral epiphysis (SCFE) fixation. The purpose of the current study was to determine if a fully threaded cancellous screw provides greater stability compared with a partially threaded screw in a porcine model. Conclusion: There was no biomechanical benefit when using a fully threaded screw for stabilization of an in vitro SCFE model. Although there were no differences between screw types in an in vitro model, bone healing around the fully threaded screw may eventually provide greater stability. The use of fully threaded screw remains a reasonable option in the treatment of SCFE, and implant removal may be easier with such a system.

Mohamad F, Parent S, Pawelek J, Marks M, Bastrom T, Faro F, Newton P: Perioperative complications after surgical correction in neuromuscular scoliosis. J Pediatr Orthop, 27:392-7, 2007.

This study evaluates the perioperative complications associated with surgical correction in neuromuscular scoliosis and to identify the risk factors associated with these complications. Conclusions: Patients with neuromuscular scoliosis are at high risk of developing perioperative complications after surgical correction of their deformity (overall rate, 33.1%).

Newton PO, Upasani VV, Farnsworth CL, Oka R, Chambers RC, Dwek J, Kim JR, Perry A, Mahar AT: Spinal growth modulation with an anterolateral flexible tether in an immature bovine model: disc health and motion preservation. Spine, 33:724-33, 2008.

Spinal growth modulation by tethering the anterolateral aspect of the spine, as previously demonstrated in a nonscoliotic calf model, may be a viable fusionless treatment method for idiopathic scoliosis. The purpose of the present study was to evaluate the radiographic, histologic, and biomechanical results after six and twelve months of spinal growth modulation in a porcine model with a growth rate similar to that of adolescent patients. Conclusions: In this porcine model, mechanical tethering during growth altered spinal morphology in the coronal and sagittal planes, leading to vertebral and disc wedging proportional to the duration of tethering.

Newton PO, Perry A, Bastrom TP, Lenke LG, Betz RR, Clements D, D'Andrea L: Predictors of change in postoperative pulmonary function in adolescent idiopathic scoliosis: a prospective study of 254 patients. Spine, 32:1875-82, 2007.

A multicenter study of prospectively collected pulmonary function testing and radiographic measures in patients surgically treated for adolescent idiopathic scoliosis (AIS) was done to identify the factors that determine pulmonary function more than two years after surgery to determine what factors, if any, can predict an increase or decrease in the percent predicted two year pulmonary function. Conclusion: Aside from preoperative PFT values, open anterior approaches predict the largest percent of variance in 2-year PFT. Additionally, a clinically significant reduction in the predicted 2-year pulmonary function is more likely when performing a thoracoplasty.

Parent S, Wedemeyer M, Mahar AT, Anderson M, Faro F, Steinman S, Lalonde F, Newton P. Displaced olecranon fractures in children: a biomechanical analysis of fixation methods. J Pediatr Orthop, 28:147-51, 2008.

Wire and suture methods have been used to stabilize pediatric olecranon fractures. This study (1) compared differences in simulated intraoperative compression during fracture reduction, (2) evaluated articular surface compression during cyclic loading of the tension band, and (3) compared fracture stabilization after cyclic physiologic loading at low/high levels. Conclusions: Suture tension bands had lower ultimate failure loads and less compression at the fracture site. However, if low loads are expected or if the fracture is reduced easily, the suture tension band may be an appropriate alternative to wire fixation in small children or when using casts in bigger children.

Patel PN, Upasani VV, Bastrom TP, Marks MC, Pawelek JB, Betz RR, Lenke LG, Newton PO: Spontaneous lumbar curve correction in selective thoracic fusions of idiopathic scoliosis: a comparison of anterior and posterior approaches. Spine, 33:1068-73, 2008.

A retrospective evaluation of adolescent idiopathic scoliosis (AIS) patients treated with selective thoracic instrumentation and fusion to evaluate the predictors and the effect of surgical approach (anterior versus posterior) on spontaneous lumbar curve correction (SLCC) after selective thoracic fusion in patients with structural thoracic and compensatory lumbar curves.

Conclusion: Anterior and posterior instrumented fusions performed selectively on the appropriate curves result in equal SLCC when matched by LIV, flexibility of the lumbar curve, and percent thoracic curve correction achieved. This suggests that the observed phenomenon of SLCC after selective thoracic fusion in AIS is independent of surgical approach and can be reliably achieved with either technique.

Perez A, Mahar A, Negus C, Newton P, Impelluso T: A computational evaluation of the effect of intramedullary nail material properties on the stabilization of simulated femoral shaft fractures. Med Eng Phys, 30:755-60, 2008.

Titanium flexible intramedullary nails have become far more prevalent for stabilization of pediatric femur fractures in recent years. While steel may be expected to have superior fracture stability due to its higher elastic modulus; titanium alloy has experimentally demonstrated improved biomechanical stability, as measured by gap closure and nail slippage. The purpose of this study was to verify these observations computationally, and thus, explain why titanium alloy may be better suited for surgical fixation of fractured femurs. The titanium alloy nails distributed stress more evenly along the nail axis, resulting in lower peak magnitudes. The increased deformation of the titanium alloy nail likely increases the contact area with the intramedullary canal wall, thus, increasing stability.

Petcharaporn M, Pawelek J, Bastrom T, Lonner B, Newton PO: The relationship between thoracic hyperkyphosis and the Scoliosis Research Society outcomes instrument. Spine 2007 Sep 15;32(20):2226-31.

A retrospective chart review and radiographic analysis was conducted to evaluate the association between thoracic hyperkyphosis and patient quality of life measures as determined by the Scoliosis Research Society (SRS) outcomes instrument. Conclusion: These findings indicate that higher kyphosis magnitudes were associated with increased pain, lower self-image, and decreased function and activity. Patients with thoracic hyperkyphosis were significantly more symptomatic than normal subjects in all domains.

Raney EM, Freccero DM, Dolan LA, Lighter DE, Fillman RR, Chambers HG. Evidence-based analysis of removal of orthopaedic implants in the pediatric population. J Pediatr Orthop, 28:701-4, 2008.

The English literature was systematically reviewed for scientific evidence supporting or disputing the common practice of elective removal of implants in children. Conclusions: There is no evidence in the current literature to support or refute the practice of routine implant removal in children.

Sanders JO, Harrast JJ, Kuklo TR, Polly DW, Bridwell KH, Diab M, Dormans JP, Drummond DS, Emans JB, Johnston CE 2nd, Lenke LG, McCarthy RE, Newton PO, Richards BS, Sucato DJ; Spinal Deformity Study Group. The Spinal Appearance Questionnaire: results of reliability, validity, and responsiveness testing in patients with idiopathic scoliosis. Spine, 32:2719-22, 2007.

The SAQ was designed to measure patients' and their parents' perception of their spinal deformity's appearance using standardized drawings and questions. This study was designed to

test the instrument's psychometric properties. Conclusion: The SAQ is reliable, responsive to curve improvement, and shows strong evidence of validity. It provides more detail than the SRS in the appearance domain, and provides explanation of spinal deformity's concerns and improvements.

Steinman S, Bastrom TP, Newton PO, Mubarak JS: Beware of Ulnar Nerve Entrapment in Flexion-Type Supracondylar Humerus Fractures. J Childrens Orthopedics, 1:177-80, 2007.

A recent study reported a higher incidence of pre-operative ulnar nerve symptoms in patients with flexion-type supracondylar fractures than in those with the more common extension supracondylar fractures and a greater need for open reduction. We have encountered a specific pattern of flexion supracondylar fractures that often require open reduction with internal fixation (ORIF) due to entrapment of the ulnar nerve within the fracture. Conclusion: Flexion-type supracondylar fractures remain a relatively uncommon variant (2-3%) of supracondylar fractures. Recent reports have noted that open treatment of these fractures is required more frequently than for extension fractures. In our series, 20% of the open cases were flexion-type fractures and in half of these the ulnar nerve was found to be entrapped in the fracture, preventing reduction.

Upasani VV, Caltoum C, Petcharaporn M, Bastrom T, Pawelek J, Marks M, Betz RR, Lenke LG, Newton PO: Does obesity affect surgical outcomes in adolescent idiopathic scoliosis? Spine, 33:295-300, 2008.

A retrospective review of surgical outcomes in adolescents with idiopathic scoliosis was conducted to determine if an association exists between body mass and surgical outcomes in adolescent idiopathic scoliosis (AIS). Conclusion: Overweight adolescents (BMI % ≥ 85) had a greater thoracic kyphosis before surgery compared with their healthy weight peers. Body mass, however, did not affect the ability to achieve coronal or sagittal scoliotic deformity correction.

Upasani VV, Caltoum C, Petcharaporn M, Bastrom TP, Pawelek JB, Betz RR, Clements DH, Lenke LG, Lowe TG, Newton PO: Adolescent idiopathic scoliosis patients report increased pain at five years compared with two years after surgical treatment. Spine, 33:1107-12, 2008.

A multicenter study of changes in Scoliosis Research Society (SRS) outcome measures after surgical treatment of adolescent idiopathic scoliosis (AIS) was conducted to evaluate changes in patient determined outcome measures between 2 and 5 years after AIS surgery. Conclusion: There was a statistically significant increase in reported pain from 2 to 5 years after surgical treatment; however, the etiology of worsening pain scores could not be elucidated.

Upasani VV, Chambers RC, Mubarak SJ. Analysis of calcaneonavicular coalitions using multi-planar three-dimensional computed tomography J Childrens Orthopedics, 2:301-7, 2008.

The purpose of this study was to evaluate three-dimensional (3D) multi-planar CT images of calcaneonavicular coalitions and adjacent tarsal relationships. Conclusions: 3D CT reconstructions enabled the classification of the spectrum of calcaneonavicular coalitions. The shape of the cuboid was found to

correlate with the extent of ossification. An understanding of the 3D anatomy is important when diagnosing milder forms of coalitions, and during resection in order to avoid iatrogenic injury to the calcaneus, head of the talus, or cuboid.

Upasani VV, Newton PO. Anterior and thoracoscopic scoliosis surgery for idiopathic scoliosis. Orthop Clin North Am, 38:531-40, vi, 2007.

Anterior surgical treatments continue to evolve and provide advantages over posterior procedures in specific instances. Open and thoracoscopic anterior approaches allow direct access to the anterior stabilizing structures of the spine. Although the indications and contraindications for anterior versus posterior surgical intervention (for thoracic and thoracolumbar curve patterns) have been defined to some degree, there remains appropriate flexibility in the decision-making process.

Upasani VV, Tis J, Bastrom T, Pawelek J, Marks M, Lonner B, Crawford A, Newton PO: Analysis of sagittal alignment in thoracic and thoracolumbar curves in adolescent idiopathic scoliosis: how do these two curve types differ? Spine, 32:1355-9, 2007.

Relative anterior overgrowth has been suggested as the possible pathomechanism behind thoracic scoliosis. Given the proposed importance of the sagittal alignment on the development of AIS and the known association between pelvic parameters and sagittal alignment, the authors postulate that pelvic incidence may influence the location of vertebral column collapse associated with different AIS curve types. Conclusion: An increased pelvic incidence, associated with both thoracic and thoracolumbar curves when compared with the normal adolescent population, does not appear to be the potential determinant of the development of thoracic versus thoracolumbar scoliosis, but may be a risk factor for the development of adolescent idiopathic scoliosis.

Van Valin SE, Wenger DR. Value of the false-profile view to identify screw-tip position during treatment of slipped capital femoral epiphysis. A case report. J Bone Joint Surg Am, 89:643-8, 2007.

This paper clarifies that despite intraoperative image intensifier confirmation and high quality postoperative radiographs, it is still possible that the tip of a pin can end up penetrating the joint in slipped capital femoral epiphysis. A false profile view taken in an office may clarify the diagnosis even before a CT scan has been ordered.

Wedemeyer M, Parent S, Mahar A, Odell T, Swimmer T, Newton P: Titanium versus stainless steel for anterior spinal fusions: an analysis of rod stress as a predictor of rod breakage during physiologic loading in a bovine model. Spine, 32:42-8, 2007.

The in vitro biomechanical evaluation of rod stress during physiologic loading of anterior scoliosis instrumentation was designed to determine effects of material properties and rod diameter on rod stresses in anterior scoliosis instrumentation. Conclusions: The percentage of yield stress was lowest for the 4.75-mm Ti rod for all tests due to titanium's greater yield stress. This suggests the 4.75-mm rod has a lower fatigue failure risk than either steel construct.

Wenger D, Miyanji F, Mahar A, Oka R: The mechanical properties of the ligamentum teres: a pilot study to assess its potential for improving stability in children's hip surgery. J Pediatr Orthop, 27:408-10, 2007.

The anatomic and histological characteristics of the ligamentum teres and its vascular contributions to the femoral head have been well described. The function of the ligamentum teres remains poorly understood. Although excision is the current standard in treating complete developmental hip dysplasia, we developed an interest in maintaining, shortening, and reattaching the ligament to assure early postoperative stability in developmental hip dysplasia. The strength of the ligamentum teres may confirm its potential for providing early stability in childhood hip reconstructions. In the setting of dysplasia, the preservation and the transfer of the ligamentum teres to augment stability should be considered as an adjunct to open reduction.

Wenger DR. Spine surgery at a crossroads: does economic growth threaten our professionalism? Spine, 32:2158-65, 2007.

This invited presidential guest lecture was given at the Scoliosis Research Society meeting in Monterey and was subsequently published in Spine. The paper characterizes the incredible growth in the medical and surgical research arena since the early 1980s and also some of the moral hazards that spine surgery is facing now that the nation has so many well paid spine surgeons who use progressively more expensive and more complex implants. Suggestions were made regarding professional organizations such as the SRS and how it might interface between the consumer, the implant industry, and those who pay the bills.

Wenger DR, Mubarak SJ, Henderson PC, et al. Ligamentum teres maintenance and transfer as a stabilizer in open reduction for pediatric hip dislocation: surgical technique and early clinical results J Childrens Orthopedics, 2:177-85, 2008.

In the early surgical descriptions of both the medial (Ludloff) approach and the anterior (Salter) approach to the hip, it was generally accepted that the ligamentum teres was an obstruction to reduction and was excised (similar to the discarding of menisci for knee surgery in our orthopedic history). We developed surgical methods for maintaining the ligamentum teres when performing open reduction for hip dislocation in young children. Conclusions: In this series of 23 hips, in which ligamentum teres transfer/tenodesis was utilized, we found no residual subluxation or dislocation in either the medial Ludloff or the anterior open reduction groups. Based on these early positive results, we recommend the method for children treated with the Ludloff open reduction procedure. Although we have less experience with it, the technique presented for ligamentum maintenance and transfer in anterior open reduction may provide similar added stability.

Willy C, Schneider P, Engelhardt M, Hargens AR, Mubarak SJ: Richard von Volkmann: surgeon and Renaissance man. Clin Orthop Relat Res, 466:500-6, 2008.

Richard von Volkmann (1830-1889), one of the most important surgeons of the 19(th) century, is regarded as one of the fathers of orthopaedic surgery. He was head of the Department of Surgery at the University of Halle, Germany (1867-1889). His

powers of observation and creativity led him to findings and achievements that to this day bear his name: Volkmann's contracture and the Hueter-Volkmann law.

Zhang AL, Exner GU, Wenger DR. Progressive genu valgum resulting from idiopathic lateral distal femoral physal growth suppression in adolescents. J Pediatr Orthop, 28:752-6, 2008.

Progressive genu varum with disturbance of medial tibial physal growth (classic Blount disease) is a well-studied phenomenon, and in rare cases, genu varum can occur because of medial distal femoral physal growth disturbance (so-called femoral Blount disease). To our knowledge, progressive genu valgum caused by disturbance of lateral distal femoral physal growth has not been described. This article presents the history, clinical findings, imaging studies, results of surgical treatment, and speculation regarding the etiology of this disorder in 2 girls who presented with relatively rapid progression of knock-kneed deformity. Magnetic resonance imaging studies demonstrated unusual circular peglike disturbances of the lateral distal femoral physes. Conclusions: Obesity and repetitive microtrauma, superimposed on genetic factors (physis that is sensitive to compressive forces), may contribute to the etiology of this rare disorder.



The surest way to corrupt a young man is to teach him to esteem more highly those who think alike than those who think differently. – NIETZSCHE



Spreading the Word – Global Outreach

The Children's Hospital – UCSD orthopedic faculty continue to be involved in education and research throughout the world.



Dr. Wenger (center left), orthopedic residents, and Dr. Patricia Fucs (right)
– Director of Peds. Ortho. – Santa Casa Hospital – San Paolo, Brazil – May 2008



D. Wenger (San Diego),
Prof. Fritz Hefti (Basel)
EPOS – Lisbon – 2008



Dr. Chambers (left) and pediatric orthopedic faculty –
Jerusalem – Fall 2008
(Sports and Disability Conference)



Left to right. George Thompson (Cleveland), Scott Mubarak, Barbara Wall, Sandy Mubarak, Eric Wall (Cincinnati - former UCSD resident), Janice Thompson.
Lisbon, Portugal – EPOS



Dennis and Kathy Wenger, and Steve and Denny Richards (POSNA President) at
EPOS presidential dinner.
Lisbon, Portugal – April 2009

Spreading the Word - Continued



S. Mubarak (San Diego) and Cristina Alvis (former international fellow). Cristina showed the Mubaraks around the island of Madeira, Portugal where she is in practice (after EPOS meeting).



S. Mubarak (San Diego), Nick Portinaro (host – Milan), Lou Diaz (Chicago) (C.P. course – Milan, Italy – Sept. 2008)



Dr. Wenger giving “follow-up care” to his DDH surgical patient (treated at RCHSD) Damascus, Syria (April, 2009)



Peter Newton and Dr. and Mrs. Jun Takahashi. Japanese Orthopedic Association meeting – May 2009



Jill and Hank Chambers, Sydney, Australia for Cerebral Palsy Meeting



Dr. Wenger and local faculty – Children’s Hospital – Florianopolis, Brazil – May 2008