



# MASSACHUSETTS GENERAL HOSPITAL

HARRY E. RUBASH, MD



*The Orthopaedic Journal at Harvard Medical School* has become an annual tradition to chronicle our achievements, celebrate our successes, highlight new additions to the program and, most importantly, give readers a sense of the spirit and strength embodied in our program. My fourth Annual Report will reflect the many accomplishments and additions to our staff at the Department of Orthopaedic Surgery, Massachusetts General Hospital.

### CHIEFS HISTORY WALL

In November we dedicated our new *Chiefs of Orthopaedic Surgery Wall* which is displayed on White 6. The wall is a historic collection of biographical sketches and photographs chronicling the Department of Orthopaedic Surgery back to its inception here at the MGH in 1899.



Dr. Harry E. Rubash and Karen Bernstein in front of the Chiefs of Orthopaedic Surgery Wall on White 6

When I arrived here at the MGH to assume the role of Chief of Orthopaedic Surgery, I felt that we lacked an awareness of our own history. Many great surgeons, teachers and caregivers have graced the halls of this institution throughout the years. It was my intention to recognize these pioneers and their contributions to the MGH, the field of orthopaedic surgery and their communities. The process was a fascinating lesson in the history of the MGH and the field of orthopaedic surgery. Much of the early historic information was a challenge to find, and we were pleased to have Lee Beadling as a consultant. Lee is an *Orthopaedics Today* correspondent and author of the *Pioneers in Orthopaedics, The People Who Shaped the Specialty* series in *Orthopaedics Today*. I also wish to thank

Michelle Rose in the MGH Photography Department for her dedicated work in tracking rare photographs through the MGH archives and Karen Bernstein, our Clinical Research Editor, for her work on this project.

### ANNOUNCEMENTS

I am pleased to announce that Dr. James Herndon, Chairman of Partners Department of Orthopaedic Surgery and the William H. and Johanna A. Harris Chair in Orthopaedic Surgery was recently selected the 1<sup>st</sup> Vice-President of the American Academy of Orthopaedic Surgeons (AAOS). Congratulations to Dr. Herndon on this honor.

I was very pleased to be named the Third Edith M. Ashley Professor of Orthopaedic Surgery in January, following in the footsteps of two former Chiefs of Orthopaedic Surgery here at the MGH, Dr. Melvin Glimcher and Dr. Henry Mankin.

Dr. Julie Katarincic has played an important role in the Hand and Upper Extremity Service as well as an important administrative role as the Interim Chief of Pediatric Orthopaedics at the MGH. Julie performed admirably in her Interim Chief role and has greatly improved patient access and the organization of care for pediatric orthopaedic patients at the MGH. Thank you to Dr. Katarincic for her dedication and hard work during this interim period. We wish her well in her new position at Brown University.

### NEW CLINICAL FACULTY

Fortunately, we have nearly completed our first major wave of recruitment into the department. Dr. Malcolm Smith, Associate Chief of Orthopedic Trauma Services, joined the MGH as of January 1<sup>st</sup>. Dr. Smith trained in Orthopaedic Trauma



Dr. Mark Vrahas and Dr. Malcolm Smith

in the United Kingdom and received his MD from University of Leeds. He completed his orthopaedic residency at the renowned Nuffield Orthopaedic Centre at Oxford University and finished a pediatric Orthopaedic Fellowship at the Children's Hospital Medical Center in Boston with John Hall, MD. He followed this with a Trauma Fellowship in pelvic and acetabular reconstructive surgery at the University of Southern California, Los Angeles with Joel Matta, MD. He holds accreditation in Trauma and Orthopaedic Surgery by the Royal College of Surgeons of England and he is currently President of the British Trauma Society. Dr. Smith is a fine asset to our institution and we welcome him and his family to the MGH community.

It is a great pleasure to welcome Dr. Brian Grottkau as Assistant Professor of Orthopaedics, Assistant Orthopaedic Surgeon, and the new Chief of Pediatric Orthopaedics at MGH and the MassGeneral Hospital for Children.

Dr. Grottkau is a graduate of Harvard College, Harvard Medical School, and the Harvard Combined Orthopaedic Residency Training Program, having served his Chief residency at the MGH on the East Orthopaedic Service. He completed a fellowship in Adult Spinal Surgery at the New England Baptist Hospital followed by a combined Pediatric Orthopaedic Fellowship at Children's Hospital in Boston and the University of California. He subsequently returned to Boston to become Chief of Pediatric Orthopaedics, Scoliosis and Adult Spine Surgery at the Tufts/New England Medical Center and Floating Hospital for Children. Dr. Grottkau joined the MGOA in March. Dr. Grottkau commented that "returning to the MGH is like returning home again. I have been welcomed back by many old faces and warmly greeted by many new ones. I chose to return to the MassGeneral Hospital for Children because of the outstanding commitment the Hospital is making to establish a patient- and family-focused hospital for children." Dr. Grottkau will help oversee the creation of a strong pediatric orthopaedic division. His noted skills as a surgeon and researcher combined with his ability to affect collaboration among colleagues makes him an invaluable asset in our efforts to provide children with the highest quality of emergency and routine orthopaedic care. He has researched and published on the effect of strain on macrophage activation, care of pediatric fractures, and is currently working on a variety of issues in pediatric trauma. We also welcome his wife Sharon and his children, Andrew (age 5), Matthew (age 3) and Molly (age 1) to the MGH community.



**Dr. Brian Grottkau,**  
Chief of Pediatric  
Orthopaedics

Dr. Grottkau heads a dedicated staff of pediatric orthopaedic surgeons. Julie Katarincic, MD, who quite ably assumed the role of Interim Chief of Pediatric Orthopaedics during the search process, is returning to Brown University in the spring. Dr. Saechin Kim focuses on general pediatric orthopaedic surgery, while Dr. Mark Gebhardt has special interests in benign and malignant bone tumors in the pediatric

patient. I am confident that Brian will lead the Pediatric Orthopaedic team in its expanding relationship with the MassGeneral Hospital for Children, the MGH Health Centers and in further collaboration with the Boston Shriners Hospital for Children.

Dr. Andrew Hecht has become an integral part of the MGH Orthopaedic Spine Center and is splitting his time between the MGH and the Newton Wellesley Hospital. He has been actively involved along with Dr. Frank Pedlow, Chief of the MGH Orthopaedic Spine Center, in redefining the mission of our Spine Service and developing a complete and comprehensive center for spinal care at the MGH. In the near future, Andy will be opening a laboratory in the new Jackson 12 space here at the MGH.



**Dr. Andrew Hecht**

### ADMINISTRATION

Mr. David Gaynor joined our practice in 1999 as the Administrative Director of the Orthopaedic Service. He has assembled an outstanding administrative team to help with the many demands of our growing practices and has been actively involved in planning the strategic development of the department.

An integral part of Mr. Gaynor's newly expanded administrative team is Ms. Lauren Ellis, our new department Administrative Manager, whom we welcomed in October 2001. Ms. Ellis joined us with seven years of health care related experience from Stanford Medical Center, where she was the Manager of Strategic Planning. Her chief responsibilities include financial management for the Department and operating responsibilities for the departments of Orthopaedic Oncology, Arthroplasty, the MGH Orthopaedic Spine Center and Pediatric Orthopaedics.

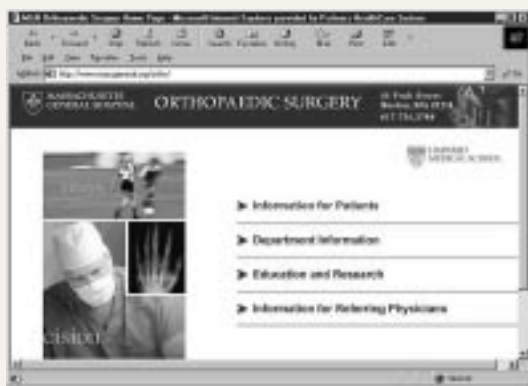


**Lauren Ellis,**  
MGH Department of  
Orthopaedic Surgery,  
Administrative Manager

Ms. Ellis reports, "I am pleased to have joined the Department of Orthopaedic Surgery administrative team here at the MGH and I look forward to increasing my administrative and operational functions in our clinical service areas. My goal is to continue working on financial administration while improving service, efficiency and overall patient and physician satisfaction in the department." We are pleased to have Ms. Ellis as a member of the department and we welcome her to the MGH community.

David Gaynor and The Orthopedic Surgery Web Committee, chaired by Dr. Jon J.P. Warner with members Dr. Thomas Gill, Dr. Francis Hornicek, Dr. David Ring and Karen Bernstein have recently rolled out the new MGH Orthopaedic website. Under the direction of the Web Committee, Ms. Bernstein, who joined us in January 2001 from the American Society of

Clinical Oncology (ASCO), has worked closely with Partners Information Services and the MGH Marketing Department on the design and content of our expansive new website. She reports “the Committee plans to continue improving upon the initial design and further develop the site’s content. The idea is for the pages to be dynamic and change with continued focus on the needs of the user. In the case of the clinical service areas, we are aiming at reaching patient populations seeking online orthopaedic information and referrals to area surgeons. The focus becomes somewhat different for the laboratory areas and we are currently coordinating our efforts to explore the needs of our target audience for this specialized area.” Please visit the home of the Department of Orthopaedic Surgery web site at [www.massgeneral.org/ortho](http://www.massgeneral.org/ortho).



The MGH Department of Orthopaedic Surgery homepage



Karen Bernstein shown with the Department of Orthopaedic Surgery web site

Extensive work and planning went into launching the new website this past summer. Dr. Warner reports that “the MGH Orthopaedic Department has been actively developing its Internet presence through the Orthopaedic Web Committee. We recognize the power of the Web and we will focus on informing our patients. Each division will ultimately construct their own web page as a component of the department website.” In addition, work is underway to develop individual web pages for the Orthopaedic Research Laboratories. Congratulations to Web Committee on their achievements, we look forward to their continued efforts.

An additional, important aspect of David Gaynor’s position in the department has been in the planning and development of the new Musculoskeletal Institute, which will house the Department of Orthopaedic Surgery in the new Ambulatory Care Building. The Ambulatory Care Building, currently under construction, will be approximately 420,000 square feet and will also house a new Cancer Center, the Women’s Center and the Cardiac Center for the MGH. The Musculoskeletal Institute will occupy 44,000 square feet and will include a centralized Radiology Service within the Institute, expanded waiting areas, procedure rooms, and offices for our practitioners. A massive fundraising activity is underway to raise over \$90 million in philanthropy for this project. The new ambulatory building will provide an exciting opportunity to consolidate the MGH Orthopaedics Department in one location, enabling us to provide high quality orthopaedic services more efficiently and effectively. All of the service chiefs have been working with David and me to develop the final floor plans for this exciting new center. Mr. Gaynor reports that “we look forward to moving operations to the new ambulatory care building in approximately two years. One of our recent challenges has been to allocate space for the most optimal arrangement of our clinical areas within the Musculoskeletal Institute. It will be exciting to see all these efforts and the floor plans materialize into actual offices, exam rooms, and procedure spaces for our patients. The Musculoskeletal Institute will launch a new era in advancing Orthopaedic Surgery at the MGH.”

Groundbreaking on the new facility has already occurred and expected occupancy is in the fall of 2004. Buzzy’s Fabulous Roast Beef is now closed, the property having been acquired by the MGH. The Charles Circle late night icon will be surely missed, and as the new ambulatory building comes to fruition, the name Buzzy’s will move from the Boston vernacular to the land of local trivia.

### **ORTHOPAEDIC PRACTICE AT THE MGH**

Our new practice model is fully operational at the MGH. Tom Amerault, Director of the Orthopaedic Billing Office, has created an outstanding group with dedicated orthopaedic billing personnel. Our clinical and surgical activities continue to grow, and we have greatly increased our patient capacity in all of our practice locations. In 2001 we saw 41,000 outpatients, admitted 3700 patients, and performed 9000 surgeries, which represents a 5% increase in overall inpatient and outpatient activities. This expansion in our clinical and surgical activities will increase as the department continues to grow. An expanded Pediatric Orthopaedic Service, additions to the Foot and Ankle Service, Trauma Service, and Sports Medicine Service are anticipated.

### **NEWS FROM THE OPERATING ROOM**

Major strides have been made in the operating rooms at the MGH over the past year. The new Orthopaedic Trauma Room is working extremely well and we are making accommodations for the new Pediatric Orthopaedic Service. We have upgraded our equipment, obtained valuable new Main Operating Room and Same Day Surgery Unit time, and have expanded the length of the operating room day for

the Orthopaedic Operating Rooms in the Same Day Unit. Hopefully, we will be able to do the same in the near future for the Main Operating Rooms. I would like to thank the OR Allocation Committee, including Dr. Dinesh Patel, Dr. Mark Vrahas, Dr. Jon J.P. Warner, David Gaynor and Jim O'Connell, as well as the OROI Committee Members for their outstanding efforts.

### MUSCULOSKELETAL CLINICAL PERFORMANCE MANAGEMENT (CPM)

Dr. William Tomford chairs the Musculoskeletal Clinical Performance Management Committee (CPM). He explained recently that when orthopaedic surgeons hear the acronym CPM they tend to think “continuous passive motion,” not “Clinical Performance Management”. His focus at this juncture is the Clinical Performance Management Committee initiated by Dr. Peter Slavin, President of the MGH Physicians Organization, to address issues around the MGH that impact patient care and the hospital’s overall efficiencies. There are four major objectives for CPM: improve the quality of patient care, increase the efficiency of our care delivery processes, optimize the use of our inpatient and outpatient capacity, and improve the quality of our professionals’ practice lives. The Musculoskeletal CPM Committee is one of many specialty sub-committees under the CPM umbrella and focuses on the distinctive needs of the orthopaedic patient and physician. This sub-committee, under Dr. Tomford’s dedicated direction, also has input from nurse and case managers, Dr. Malcolm Smith, David Gaynor and Dr. Jeff Weilburg, who serves as the liaison to the hospital-wide CPM,

One of the most important areas addressed by the CPM Committee has been to reduce the average length of hospital stay without impacting patient care and services. Four years ago the average length of stay of an orthopaedic inpatient was seven days. Today that average is down to four days. Annually, the Musculoskeletal CPM has successfully placed below the budgeted length of stay as dictated by the larger CPM group and

has served as a model for other specialties in reducing length of stay at the MGH. Another important success for this committee was the recent standardization of discharge procedures for orthopaedic patients. A new computer template was created to improve efficiency in this area and has significantly streamlined this process for patients and caregivers. I would like to thank Dr. Tomford and the CPM Committee for their outstanding work on these important issues and look forward to the implementation of their new projects in the near future.



**Dr. William Tomford,**  
Chair of the Musculoskeletal  
Clinical Performance  
Management Committee  
(CPM)

### SERVICE UPDATES

#### ADULT RECONSTRUCTIVE SURGERY SERVICE

The Adult Reconstructive Surgery Service at the MGH has had a truly outstanding year with respect to clinical care



Dr. Andrew Freiberg and Dr. William H. Harris

and research. This year marked the transition in leadership when Dr. Andrew Freiberg became the new Service Chief and assumed the many administrative roles Dr. William Harris so admirably performed. Dr. Freiberg reports, “It is a great honor to have the opportunity to follow Dr. Harris’ exemplary leadership and devotion to patient care. He serves as a great role model and as the quintessential physician scientist. Our patients will forever benefit from his many contributions to the field of total hip replacement.” Dr. Freiberg is doing an outstanding job in his new position as Chief of the Adult Reconstructive Service. He is pursuing his interest in minimally invasive surgeries in the operating room and in the robotic laboratory.

The Adult Reconstructive Surgery Service continues to be the most active inpatient division within the department. This has been an eventful year with our major commitment to total hip wear studies using RSA techniques in collaboration with Henrik Malchau from Sweden. Our study, the first of its kind, compares 28mm articulations to the new 36mm articulations, both with highly cross-linked polyethylene. This truly innovative research is part of Charlie Bragdon’s PhD thesis at the University of Goteberg. Also of note, the first highly crosslinked polyethylene for the knee was implanted this year. We are currently developing protocols to utilize RSA in knee arthroplasty (total and unicompartmental) with the goal of improved knowledge about wear and kinematics.

On the research front, this was an extremely productive year for the service. Members of the Adult Reconstruction Service spoke every day at this year’s AAOS and ORS meetings with a record number of presentations. Topics in these scientific meetings included the following presentations: *Early Surface Findings in Retrieved Highly Cross-Linked Polyethylenes*, *In Vivo Oxidation of Polyethylene*, *Kinematics of High Flexion Total Knee Arthroplasty*, and *Gene Therapy for Rheumatoid Arthritis*. We also represented a substantial portion of the Society of Biomaterials program. Dr. Freiberg was “pleased the 2000 Ranawat Award was given to Dr. Richard Berger, Dr. Mark



Dr. Mark Miller, Dr. Richard Berger, and Dr. Harry E. Rubash

Miller and Dr. Rubash for their work on *A Rationale for Using the Epicondylar Axis as the Reference for Femoral Component Revision in Total Knee Arthroplasty.*”

We also continue to fund the Hugh P. Chandler Adult Reconstructive Fellowship here at the MGH, and our educational program continues to thrive with the success of four outstanding fellows: Danton Dungy, MD, Amir Jamali, MD, Steve Schule, MD and Arthur Mark, MD. These fellows represent the newest members of The Harris Club, which had a very successful annual meeting in Dallas at the Academy. Most notable from that dinner was being able to view the videotapes of the Festschrift for Dr. Harris.

We have just announced a new multi-disciplinary conference, the Combined Arthroplasty and Oncology Service Rounds (CAOS). This monthly conference will allow us to focus on the most complex reconstructive challenges combining our expertise in implant and allograft techniques. The Adult Reconstructive Surgery Service has also established a training center for minimally invasive techniques with a major focus on unicompartmental knee arthroplasty.

Dr. Stephen Trippel left the Service this past summer to assume to the role of the new Chief of Orthopaedic Surgery at the University of Indiana School of Medicine. While he will be missed here at the MGH, I am confident that Steve will lead the Indiana program to excellence. We wish Steve all the best in this new position!

This year I will be directing the 32<sup>nd</sup> Annual Harvard Arthroplasty Course along with Program Director Emeritus, Dr. William Harris and the Program Committee. This year’s course will take place on October 2-5 at the Hyatt Regency, Cambridge and is entitled, *Advances in Hip & Knee Arthroplasty: A New Era of Minimally Invasive Techniques.* This year’s program has been expanded to include mini-debates and live audience feedback. Also featured will be the very popular live surgeries. To view course information online, visit the Harvard Medical School, Department of Continuing Medical Education home page: <http://www.cme.hms.harvard.edu>.

#### **FOOT AND ANKLE SERVICE**

The Foot and Ankle Service continues to grow under the direction of George Theodore, MD and with the assistance of

James Heckman, MD. Over 3,000 outpatients were treated this year, and the unit remains a main referral center for the greater Boston area. Dr. Theodore reports, “there is continued outreach to primary care providers and community orthopedic surgeons. The diabetic foot program has expanded with emphasis on complex reconstructions and limb-sparing techniques. We have developed relationships with vascular surgery, endocrinology, podiatry, and infectious disease.” Dr. Theodore received a Clinical Excellence Award in 2001 from the MGH and MGPO. Congratulations to George on this outstanding accomplishment.

There is continued focus on the treatment of cartilage injuries, deformities, and arthritis. Minimally invasive procedures are also being tested including small joint (eg. subtalar) arthroscopy, achilles bursoscopy, and endoscopic neuroma excision. The most promising area of research remains extracorporeal shock wave therapy, which has received FDA approval and may be used in the near future to treat multiple chronic soft tissue injuries.

Resident teaching remains an important goal of the Foot and Ankle Service, and they are looking forward to the addition of a fellow who will assist in the initiation of prospective studies examining the treatment of sports injuries to the foot and ankle.

#### **PODIATRIC UNIT**

The Podiatric Unit at the MGH continues to conduct an extremely busy clinical practice and support a nationally-recognized post-graduate education program, both under the direction of Dr. Robert J. Scardina. The Unit maintains its primary clinical practice at the Main Campus, with satellite practices at all three MGH affiliated health centers. Inpatient consultation services are provided at the MGH, Spaulding Rehabilitation Hospital, Massachusetts Eye and Ear Infirmary and Shriners Burns Institute. Under a new affiliation, MGH podiatry staff now provides outpatient foot care at MIT. “Although we are currently maximizing the utilization of our resources to provide the best possible clinical care and post-graduate education,” reports Dr. Scardina, “our entire staff looks forward to the challenges of a changing health care



Dr. Harry E. Rubash and Dr. George Theodore

delivery system, and the opportunities available at the MGH to meet these challenges.”

Efforts to address the continued high demand for services at the Main Campus site have been coordinated with the assistance of Ms. Lillian Figueroa, Podiatry Practice Manager. These efforts include not only stricter scheduling supervision, but also innovations such as specific ‘emergency’ sessions, in an effort to address urgent patient care needs. Despite extremely busy professional schedules, all active staff and residents participate in providing foot care at the Pine Street Inn, a program now entering into its 12<sup>th</sup> year of voluntary service.

The Podiatric Unit strives to optimally address both the unique and general foot care needs of our patients with attention to quality and cost effectiveness, utilizing state-of-the-art treatments. Members of the Unit have worked closely with the MGH Orthopaedic Staff, most recently with the Foot and Ankle Service, for more than two decades, on both clinical and educational levels. An additional inter-specialty clinical relationship has recently been developed with the MGH Wound Clinic.

I am pleased to report that Dr. Scardina has been appointed to both the Massachusetts Podiatric Medical Society Education Committee and the Massachusetts Board of Registration Commission on Diabetic Foot Care. Congratulations to Dr. Scardina on these important appointments.

#### **HAND AND UPPER EXTREMITY SERVICE**

The Hand and Upper Extremity Service led by Dr. Jesse Jupiter continues to be the busiest service in the outpatient unit at the MGH and continues to work closely with the Trauma Service and the Pediatric Orthopaedic Service. The Hand Service enjoys a steady stream of national and international visitors, which helps to maintain an active academic interchange. They have established fruitful research collaborations with many visitors such as Dr. Karl Prommersberger from Germany and Dr. Satoshi Toh from Japan.

Dr. Jupiter reports: “Along with the exciting clinical research and teaching activities that have been the hallmark of the Orthopaedic Hand Service, we take particular pride in our ability to care for all patients who come to the Massachusetts General Hospital for evaluation and treatment of problems of their upper limb.”

While the Hand and Upper Extremity Service has a consistent presence at major national and international meetings, last year was particularly busy. The service presented four papers and eight posters at the American Society for Surgery of the Hand meeting in Baltimore, four papers and one poster at the Orthopaedic Trauma Association meeting in San Diego, and five papers and two posters at the AAOS meeting in Dallas. This year will also see a number of publications as many papers are currently in press, including three in the *Journal of Bone and Joint Surgery*. Much of this success can be attributed to the many fellows, residents, medical students, and pre-medical students that have helped the Hand and Upper Extremity Service with research endeavors. Research assistants John

Kadzielski and Leah Fourt have also played an important role, and the support of an unrestricted AO Foundation grant, which has just been renewed for three more years, has been extremely important. Congratulations to the Hand and Upper Extremity Service on these fine accomplishments.

#### **HARVARD SHOULDER SERVICE**

The Harvard Shoulder Service, a division of Partners Healthcare, recently added Peter Millett, MD at the MGH and BWH to expand service and enhance teaching and research commitments. Last year, surgical procedures performed by the Shoulder Service at both the MGH and BWH more than doubled.

The Shoulder Service continues to train fellows at the postgraduate level. Two Intercontinental Shoulder Fellows recently finished at Harvard Medical School and Balgrist Hospital in Zurich, Switzerland. Both now hold leadership positions in management of shoulder problems in their respective communities.

There were over 40 international visitors to the Shoulder Service last year. At this year’s AAOS Meeting, the Shoulder Service presented 16 papers, including several Symposia and Instructional courses. Research is ongoing as the laboratory goes through transition and is set to move to the new Jackson 12 space at the MGH.

#### **ORTHOPAEDIC ONCOLOGY**

The Orthopaedic Oncology Service at the MGH continues to flourish. Dr. Francis Hornicek and Dr. Mark Gebhardt are busy clinically with bone and soft tissue tumor patients in the clinic and operating room. Dr. Hornicek reports, “the Orthopaedic Oncology Unit is providing the excellent clinical care established by Dr. Mankin’s nearly 30 years of leadership.” Dr. Mankin is directing more of his time towards research activities and is pursuing some new exciting research projects.

The orthopaedic oncology team’s contributions to the Orthopaedic Training Program and Fellowship Program are greatly appreciated. The Service continues its teaching commitments with their involvement in CME courses of Boston Pathology Course for Orthopaedic Surgeons and the publication of numerous clinical and research reviews. The Connective Tissue Oncology Clinic (CTOC) held on Mondays continues to work closely with medical and radiation oncologists, radiologists, bone pathologists and other integral medical personnel and services to provide optimum care for patients. I look forward to the Orthopaedic Oncology Unit’s many contributions to the area of musculoskeletal oncology and would like to thank Fran for his outstanding leadership.

#### **PEDIATRIC ORTHOPAEDIC SERVICE**

The MassGeneral Hospital for Children continues to develop and expand. As part of this process, we recently welcomed Dr. Brian Grottkau to the division of Pediatric Orthopaedics as the service’s new chief. He will help direct the expansion of the division with efforts to recruit more pediatric orthopaedists and a nurse practitioner this year. His short-term goals include providing outstanding, unobstructed care to the ever-growing number of pediatric patients referred to us by providers

within and outside the Partners organization. This includes providing coverage to the MassGeneral Hospital for Children Emergency Rooms at Newton-Wellesley Hospital and North Shore Hospital, and establishing satellite offices to better provide pediatric orthopaedic care in these communities. The Pediatric Orthopaedic Service will continue to provide essential orthopaedic services to the Shriner's Hospital for Children. They will also continue to work in close cooperation with the Pediatric Surgery, Pediatric Medicine services and MGH Health Centers to provide coordinated, high quality care for our pediatric patients. The Pediatric Orthopaedic Service also will strive to provide outstanding pediatric trauma and fracture care.

Dr. David Zaleske left the MGH in July 2001 to pursue a new opportunity at the Children's National Medical Center in Washington, D.C. Dr. Zaleske had been the driving force behind the Pediatric Orthopaedic Service since he assumed the Service Chief position in 1989. We wish Dr. Zaleske the best in his new position.

### **SPORTS MEDICINE SERVICE**

The Sports Medicine Service at the MGH continues to flourish in clinical, academic and research ventures. The program, under the skillful leadership of Dr. Bertram Zarins, provides unique and optimal care for the recreational, amateur, professional and elite athlete.

The Sports Medicine Service has had a long association with the 2001 Super Bowl Champions, the New England Patriots. Drs. Zarins and Tom Gill traveled to New Orleans this past February to provide care for the team during the big game. Dr. Zarins received the *Outstanding NFL Team Physician Award* in 2002. Members of the Sports Medicine Service staff are head team physicians for several teams. Dr. Zarins is the team physician for the *New England Patriots* (20 years), the *Boston Bruins* (25 years), and the *New England Revolution* soccer team (seven years). Dr. Arthur Boland has been the team physician for *Harvard University* for 30 years, and Dr. Gill is the team physician for the *Boston Breakers* professional women's soccer league team (two years). These



Dr. Tom Gill, Dr. David Golden, Dr. Bert Zarins, and Dr. Adolph Hutter with Superbowl XXXVI trophy

staff members also provide care for other local collegiate and high school athletic programs.

The MGH-Harvard Sports Medicine Fellowship trains three fellows a year and is accredited by the American College of Graduate Medical Education (ACGME). "The fellowship has an extraordinarily strong combination of clinical experience, academic components and athletic team experience," said Dr. Zarins.

The Sports Medicine Service is collaborating with Dr. Guoan Li, Director of the Bioengineering Laboratory on the subject of biomechanics of the posterior cruciate ligament. Three manuscripts have recently been completed on this interesting topic. They are also exploring tissue engineering approaches for biological meniscal repair with Dr. Mark Randolph, Director of the Plastic Surgery Research Laboratory, photodynamic tissue bonding with Dr. Rox Anderson, Director of the Dermatology Laboratory, and studying hamstring and other muscle injuries. Results of this research have been recently presented at the American Orthopaedic Society for Sports Medicine and at the NFL Team Physicians Meeting.

Dr. Dinesh Patel continues his important work in the Psychomotor Skills Laboratory at Ruth Sleeper Hall. The Harvard Combined Orthopaedic Residency Program is one of the few programs in the world that has a long history of training residents and fellows in this capacity. Arthroscopic surgical training in models and cadavers under Dr. Patel's apt direction continues to be valuable experience for residents and fellows. Many faculty, including myself, have enthusiastically endorsed this venture and have contributed time to these worthwhile learning sessions.

Congratulations to Dr. Gill for being named to *Boston Magazine's Top Doctors in Boston* list and to Drs. Zarins and Gill to the *Top Doctors for Women* list. Dr. Boland served as "Godfather" for the American Orthopaedic Society for Sports Medicine (AOSSM) Travelling Fellows for their tour of the Pacific Rim. This has been an exciting year for the Sports Medicine Service. They are to be recognized for their many outstanding accomplishments.

### **ORTHOPAEDIC SPINE CENTER**

The Orthopaedic Spine Center at the MGH is now in its third year of existence. We are pleased to welcome surgeon Andrew Hecht, MD, physiatrist Dr. David Karli, nurse practitioner Courtney Finnegan and physician assistant Lisa Beyer to our department. These new team members have joined Service Chief Dr. Frank Pedlow, Dr. Fred Mansfield, and physiatrist Dr. James Sarni to staff the multidisciplinary Orthopaedic Spine Center.

The Orthopaedic Spine Center is responsible for all clinical, teaching, and research activities related to disorders of the cervical, thoracic and lumbar spine. With an emphasis on the conservative management of back and neck problems, the Center works closely with physiatrists, physical therapists, and the MGH Pain Center. Dr. Frank Pedlow, Chief of the MGH Orthopaedic Spine Center, reports, "The Spine Service has undergone considerable growth in the past year, adding



Dr. Frank Pedlow, Nurse Practitioner, Courtney Finnegan, Dr. Andrew Hecht, and Physician Assistant, Lisa Beyer

a surgeon, a physiatrist, a NP and a PA, as well as additional support staff. The service now handles approximately 8000 outpatient visits a year. These timely and comprehensive evaluations offer patients the full range of conservative and operative treatment options.”

The MGH Orthopaedic Spine Center is recognized as a regional and international referral center for complex problems of the spine, including primary and metastatic bone tumors of the spine. With the MGH designated as a level-one trauma center, we also use our expertise in the management of spinal fractures and patients with spinal cord injuries.

The clinical and research activities of the Spine Center over the last year have increased. These include poster and abstract presentations at the Cervical Spine Research Society (CSRS) Annual Meeting, and an Instructional Course Lecture as well as multiple abstracts at the AAOS Annual Meeting. In addition, the Orthopaedic Spine Center has instituted a MGH Multidisciplinary Spine Conference and is scheduled to begin a Spine Fellowship program in 2003. Congratulations to Dr. Frank Pedlow and the staff.

### **TRAUMA SERVICE**

The Partners Orthopaedic Service, under the dedicated leadership of Dr. Mark Vrahas, witnessed another year of growth and success. Early in the year, we welcomed Dr. Malcolm Smith, his wife Mary, and children Ellie (age 12) and Billy (age 7) to Boston. Dr. Smith has quickly assimilated into the Harvard system, and his outstanding clinical and teaching abilities have brought tremendous benefits to patients and residents alike.

Drs. Vrahas and Smith hosted the first annual Partners Northeast Trauma Summit at Sunday River, Maine. The Summit featured several Harvard faculty: Drs. Ring, Jupiter, Lhowe, Millett, Chiodo, and Minas, who taught advances in fracture care to an audience of New England-area orthopaedists. They expect that this successful conference will become an annual event.

The Trauma Service is also pleased to report that they worked with terrific Chief Residents and Trauma Fellows this

past year, who all brought great perspective and a tremendous work ethic to the service. As a result, the Trauma Service performed the highest volume of surgeries in the Service’s history, eclipsing last year’s totals by almost 40%. Seven AO Fellows (from five different countries) and two AOA traveling fellows were welcomed. These fellows all reported that the time spent with Drs. Vrahas and Smith was uniquely valuable.

Research activities have also blossomed for the Trauma Service. The Service continues to recruit patients into the tibial plateau study, where they are comparing the alpha-BSM bone substitute with iliac crest autograft. Two new studies have also begun – one characterizing patterns of vascular injury in patients with femur fractures, the other in collaboration with Boston University looking at long-term rehabilitation outcomes in patients with femur fractures.

The Trauma Service completed a major publication this year, *A Patient Guide to Orthopaedic Trauma Care at The MGH: Expert Care for Trauma Patients*. The manual was written for the inpatient trauma population, providing information about their injuries, treatments, team, and the MGH facility. The manual, which received funding from the MGPO’s *Making a Difference* grant program, was written by a multi-disciplinary group of clinical and educational professionals.

In addition, a new research database was developed. The database – affectionately named Ortho DUDE (Data Utility for Documentation and Education), tracks injuries, treatments, and outcomes of all patients seen by the service. The Trauma Service will use the DUDE’s data to better understand our patient population through research. A detailed description of Ortho Dude is presented later in this journal.

The Trauma Service received three Partners in Excellence Awards this year. For the second year in a row, an award with Spaulding’s Musculoskeletal Unit for our joint efforts was received. The aforementioned patient manual team won an award, as did Dr. Vrahas’ secretary, Missy Tiboni. Congratulations to the Trauma Service team for their outstanding efforts as they lead the way for trauma care at the MGH.

### **RESEARCH UPDATES**

The faculty and staff of the research laboratories have been extremely busy over the last year with the reorganization of the MGH Orthopaedic Laboratories. Dr. Orhun Muratoglu, the Chair of the Executive Committee on Orthopaedic Research along with committee members Drs. Francis Hornicek and Teresa Morales have been dealing with all laboratory activities. One of the first charges I gave the committee was to develop a template and a working five-year plan document for all of the Orthopaedic Research Laboratories here at the MGH. I am pleased to report that this endeavor has recently been completed and the content is outstanding. This committee also continues to be instrumental in the allocation of the new 3,000 square feet of research space on Jackson 12. They said it would never happen, but we now fully occupy the research space on Jackson 11 and 12!

As usual, the scientists of our MGH laboratories made a strong showing at the Orthopaedic Research Society (ORS)



Annual Meeting, exhibiting over 50 podium and poster presentations. I continue my work with the ORS and congratulate additional participation from the members of our laboratories.

### **ORTHOPAEDIC BIOMECHANICS AND BIOMATERIALS LABORATORY (OBBL)**

Over the past year the research at the OBBL consisted of the continuation of previous projects as well as new initiatives. Among the continuing projects was the wear testing of the novel, highly crosslinked polyethylenes that were invented in our laboratory. Wear testing of crosslinked polyethylene tibial components for total knee replacement has been carried out using unique testing models developed in our laboratory, assessing various total knee designs in comparison with conventional polyethylene components. These investigations showed that crosslinking markedly improves delamination and the adhesive/abrasive wear resistance of tibial components, both of which are major polyethylene problems *in vivo*.

In terms of other new initiatives, the lab started and successfully completed the development of a patella wear tester. Studies of e-beam crosslinked and melted polyethylene showed no delamination, in contrast to aged conventional polyethylene components, which showed subsurface cracking and delamination. The testing was carried out during three conditions: simulated normal gait, simulated stair climbing, and simulated malaligned components.

Work on the range of motion and stability achieved with large femoral heads showed improved range of motion, greater stability and the complete elimination of component to component impingement. In conjunction with the new crosslinked polyethylene, this has been and will continue to be a major contribution to the practice of hip arthroplasty.

This past year, the lab also initiated a clinical RSA study at MGH to determine the *in vivo* wear and creep behavior of e-beam crosslinked and melted polyethylene acetabular components articulating against large femoral heads. Half of the patients in the study have already been operated on in 2001. This study will continue for the next five years. The lab has also been active in developing a hip phantom to quantify the accuracy and precision of *in vivo* RSA wear measurements in comparison to other techniques, such as those of Martell and Devane. This hip phantom has also been used to develop a more reliable radiographic method to assess *in vivo* wear. The development of a knee phantom is now helping to test the feasibility of RSA use in knee kinematics. The lab is overflowing with new activity and energy. Well, Dr. Harris hasn't really slowed down... he just changed his focus!

### **BIOMATERIALS RESEARCH LABORATORY**

The Biomaterials Laboratory with Dr. Arun Shanbhag at the helm continues to lead the way in identifying novel opportunities to help the orthopaedic patient. Capitalizing on advances in genomics, the laboratory has entered into a collaboration with deCODE genetics - an Iceland based population-genomics company, to identify the Genetic Markers for Osteoarthritis. Our arthroplasty surgeons Drs. Dennis Burke, Andrew Freiberg, Murali Jasty, Harry Rubash and



Dr. Orhun Muratoglu in his laboratory on Jackson 12

William Tomford have been recruiting patients for this study. Joan Carven from the Blood Center, Katherine Sutula from the Clinical Research Service and Lissie Fishman from the Lab have been instrumental in the early success of this study.

In other studies, we are using cDNA microarrays to investigate the gene expression profile of macrophage interactions with biomaterials. Grant Garrigues, a first year Harvard Medical School student, is helping us with the analysis of the vast amounts of data which are generated using this technology. Dr. Fabian von Knoch, our post-doctoral fellow from Germany is helping us identify the mechanisms by which bisphosphonates stimulate osteoblastic differentiation and maturation. These studies include *in vitro* studies using bone marrow cells and an *in vivo* rabbit model. Our laboratory alumni, Dr. Rajiv Sethi, is currently a PGY1 orthopaedic resident, and Dr. Gun-Il Im has recently returned to his medical practice in South Korea. Dr. Shohichi Kaneko from Japan is currently completing a fellowship in the lab. He has spent time observing clinical procedures and is also helping with various laboratory experiments. We anxiously await our new fellows Dr. Liu Yang and Dr. Kui-Chou Huang, who will arrive later this year. Congratulations to Arun who completed his M.B.A. in June! He reports, "In the post-genomic world, researchers will have to form collaborations with companies to advance science. My MBA has given me the skills needed to develop strategic alliances within academic centers and with corporate partners. Further, I hope to study the application of commonly used business practices as applies to hospital administration and finance."

### **BIOENGINEERING LABORATORY**

Groundbreaking research on musculoskeletal joint biomechanics continues at the Bioengineering Research Laboratory directed by Dr. Guoan Li. Dr. Li reports, "We have been pursuing accurate knowledge of *in vivo* knee joint function, to setup physiological criteria for surgical treatment of diseased knees in total knee arthroplasty and in ligament reconstruction."

The Arthroplasty Research Group continues to publish journal articles on the biomechanics of joint replacement. This team is pursuing a thorough understanding of human knee

joint function utilizing both *in vivo* MR images and a robotic testing system. Their goal is to provide baselines for the development of new concepts in total knee arthroplasty aimed at restoration of knee joint function throughout the entire range of function. Another focus of the group will be to simulate minimally invasive unicompartmental knee replacement using the robotic system. Specifically, the effect of unicompartmental knee replacement on cartilage contact mechanics at the contralateral side and the patellofemoral joint will be examined.

The Human Forearm Biomechanics Research Group is focusing on improving current understanding of the musculoskeletal anatomy of the forearm, as well as investigating physiological loading conditions of human forearms, using cutting-edge technology such as advanced MR image techniques, the robotic testing system, and mathematical models. Recently, a new graduate student, Andrew Silver, from the Biomedical Engineering Department at Boston University, became a welcome addition to this exciting research group.

The Sports Medicine Research Group has focused on the development of optimal ACL/PCL reconstruction models. Besides making progress in understanding injury mechanisms of the cruciate ligaments, they are using advanced MR images and computer simulations to quantify *in vivo* knee kinematics and ligament function in order to establish a physiological guideline for ligament reconstruction. Advanced mathematical models are used to optimize replacement grafts, so the structural behavior of the native ligament can be best restored.



Dr. Guoan Li and the robotic team in their lab

### **CARTILAGE BIOLOGY AND ORTHOPAEDIC ONCOLOGY LABORATORIES**

The Cartilage Biology and Orthopaedic Oncology Laboratories are under the direction of Dr. Henry Mankin. The Orthopaedic Oncology Laboratory continues to seek markers that may serve as predictors of metastasis in malignant bone and soft tissue tumors, both by molecular and biochemical studies and by flow cytometric analyses of DNA ploidy and cell cycle parameters. The Cartilage Biology group supports the work of Dr. Mankin and Dr. Christine Towle in exploring the mechanisms leading to cartilage damage in osteoarthritis. The group has an interest both in the factors that promote cartilage repair and in the regulation of the degradative cascade that leads to cartilage destruction and poorly functioning joints. The investigators are studying the effects of mechanical stimulation on IL-1 metabolism in cartilage and the mechanisms involved

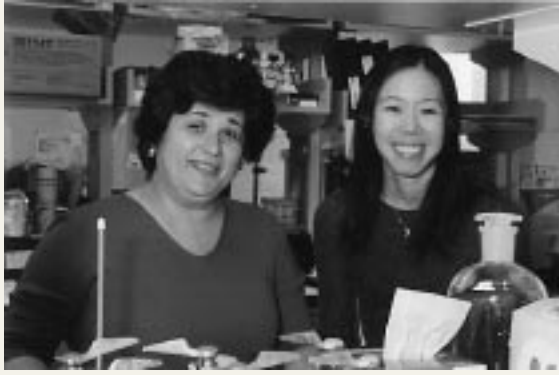
in TGF-beta inhibition of aggrecan catabolism. The laboratory has immense interest in biology-based strategies to interfere with the loss of articular cartilage in osteoarthritis. The laboratories have been funded through NIH Grants, support from the Orthopaedic Research Education Foundation, corporate sponsored research grants, and the generosity of Dr. Mankin's patients.

Many people make the success of this laboratory possible. Gertrude Fondren and Carol Trahan are working on oncology projects; Marianne Wright is working on cartilage projects. Dr. Minako Murata worked on the role of IL-1 in osteoarthritis and mechanical activation of IL-1 signaling pathways and presented her first podium presentation at the ORS; Dr. Jeungil Kim also spent time on this project. Dr. Lawrence Weissbach and Dr. Hide Morioka worked on intracellular IL-1 signaling pathways. The lab has also had many medical students who have been of great assistance, most notably Amy Simon, who worked as the Pinkney Scholar on an oncology-related project. Congratulations to the members of the Cartilage Biology and Orthopaedic Oncology Laboratories on their many successes and we look forward to their continued work in this important field.

### **SARCOMA MOLECULAR BIOLOGY LABORATORY**

The Sarcoma Molecular Biology Laboratory, under the direction of Drs. Francis Hornicek and Lawrence Weissbach, has been investigating tumor physiology and novel chemotherapeutics. Dr. Weissbach reports, "The Sarcoma Molecular Biology Laboratory is very interested in understanding how chondrosarcoma cells develop resistance to chemotherapeutic drugs. These studies may lead to diagnostic markers for predicting the onset of chemoresistance, and also to strategies to prevent drug resistance".

This laboratory currently includes Dr. Takeshi Morii, a visiting Orthopaedic surgeon from Japan, who is studying aspects of antiangiogenesis. The activity of a novel protein, plasminogen-related protein-B, has been shown to inhibit growth of a variety of tumors when tested in mice. They are currently exploring mechanistic aspects of this tumor growth inhibition, focusing on aspects of antiangiogenesis. Plasminogen-related protein-B may represent a naturally occurring protein that prevents the abnormal growth of blood vessels. The other current major research interest relates to a novel marine chemotherapeutic, ET-743, which is currently in clinical trials for treating sarcomas. One difficulty with employing chemotherapeutics for the treatment of cancer is the phenomenon of drug resistance by tumor cells. The Lab has been investigating the mechanisms responsible for mediating resistance of chondrosarcoma cells to ET-743, and preliminary results suggest that the classical mechanism involving a membrane transporter-mediated export of toxic chemotherapeutics may not be responsible for the observed drug resistance of these cells to ET-743. They are currently attempting to identify molecular abnormalities in ET-743-resistant chondrosarcoma cells, with the goal of developing diagnostic markers indicative of drug resistance.



Dr. Teresa Morales and Celeste Chang in the lab on Jackson 12

### LABORATORY OF ORTHOPAEDIC BIOCHEMISTRY AND OSTEOARTHRITIS THERAPY

Dr. Teresa Morales directs the Laboratory of Orthopaedic Biochemistry and Osteoarthritis Therapy. This laboratory is funded by a Biomedical Research Grant from the National Arthritis Foundation to study the role of the Insulin-like Growth Factors and their regulatory proteins in normal and arthritic cartilage. Current emphasis is on the binding proteins that regulate the activities of these growth factors, particularly binding protein-3, which is a very versatile protein that has activities both as a regulator of IGFs and as an independent regulator of cell growth in many systems. This protein seems to be intimately involved in the osteoarthritic process and we are working to identify its activities and to uncover methods to regulate these proteins. Part of this work, dealing with the immunohistochemistry of the binding proteins, was presented this year in Greece at the Combined Meeting of the Orthopaedic Research Societies in collaboration with Dr. Ernst Hunziker (U. Bern, Switzerland). An R01 application to expand these studies is under review at the National Institutes of Health.

The laboratory is also funded by the National Institute of Arthritis, Musculoskeletal and Skin Diseases to carry out a pilot project on the development of engineered chondrocytes with the ability to migrate and repopulate aged or diseased cartilage. This multidisciplinary project is being developed with Co-Principal Investigator, Dr. Douglas Lauffenburger, from the division of Biological Engineering at MIT. Celeste Chang, a student from MIT, is also an integral member of Dr. Morales' research team. Congratulations to Dr. Morales on the fine work her laboratory is producing, I look forward to future accomplishments in this important field of study.

### BIOMOTION LABORATORY

The MGH Biomotion Lab under the direction of Dr. David Krebs continues to be at the forefront of research in the biomechanical and neural constraints of locomotion. It was a prolific year for the lab in 2001. The lab published 9 peer reviewed articles, presented as many oral papers, received a 2-year

grant from the NIH for complementary and alternative medicine for vestibulopathy, a 5 year grant from the National Arthritis Foundation for knee arthritis studies and also received several individual honors. Congratulations to the Biomotion Laboratory for these outstanding accomplishments.

Dr. Chris McGibbon was invited to present his work titled *Rehabilitation Effects on Compensatory Gait Mechanics in People with Arthritis and Other Impairment* at the CDC/NIH sponsored "Rheumatology and Rehabilitation" conference, and he will publish this work in *Arthritis and Rheumatology*. Dr. David Krebs received the American Physical Therapy Association (APTA) Chattanooga Research Award for *Outstanding Clinical Research in Physical Therapy*, and was also the University of Florida, Gainesville's Barbara C. White Lecture Award Graduation Speaker in May 2001. In addition, Dr. Krebs was elected to membership in the ACRM Research Administration Council. He was the invited research seminar guest lecturer at Duke University in October, and was also a Combined Harvard Orthopaedics Grand Rounds speaker that same month. Wow, what a year! Congratulations to Dr. Krebs and the team at the Biomotion Laboratory.

### CARTER ROWE CONFERENCE ROOM

This past year we were saddened by the death of MGH surgeon Carter R. Rowe, MD. Dr. Rowe was a renowned shoulder surgeon, author, teacher and friend to the field of orthopaedic surgery. In November, the Department of Orthopaedic Surgery held a commemorative service in his honor called *A Celebration of the Life of Carter R. Rowe, MD*. Dr. Rowe's colleagues, friends, family and admirers gathered together to look back and reminisce on his lifetime of achievements in the historic Ether Dome. The service was followed by a dedication of the White 644 Conference Room in his name and to his memory. Honored guests included the Rowe Family: Mrs. Mary Rowe, son, John and his wife, Lauren and their children David and Stewart; Dr.



Dr. Rubash, Dr. Zarins and the Rowe Family cutting the ribbon at the Carter Rowe Conference Room Dedication



The display cabinet with Dr. Rowe's text and signature surgical tools which can be seen on White 6

Peter Slavin, President of the MGH Physicians Organization; and Ann Prespitino, Senior Vice-President of Anesthesia and Surgical Services and MGH Cardiac Program. We were also delighted to have a number of special speakers: Dr. Bert Zarins, Chief of the Sports Medicine Service; Dr. Robert Leffert, former Chief of the Surgical Upper Extremity and Rehabilitation Service; Dr. Paul Curtis, former editor of the *Journal of Bone and Joint Surgery*; and senior orthopaedic surgeons Dr. Robert Boyd and Dr. Donald Pierce. These colleagues and friends of Dr. Rowe offered wonderful reflections as did Dr. Henry Mankin, Dr. William H. Harris and Dr. Daniel Federman, Senior Dean for Alumni Relations and Clinical Teaching at Harvard Medical School.

Dr. Rowe's early orthopaedic training was in Boston and he returned to the MGH after his service in the U.S. Medical Corps during WWII. Appointed to the Orthopaedic Service here in 1946, he stayed until his retirement in 1991. When he retired, he combined his love of history, the MGH and the field of orthopaedic surgery into the book, *Lest We Forget: Orthopaedics at the Massachusetts General Hospital and Ward I, 1900-1996*.

Dr. Rowe also authored the 1986 textbook, *The Shoulder*, a classic in the specialty. Dr. Rowe is best known for developing the operative technique and surgical instruments for the popular Bankart Repair. He was also a pioneer in treating atraumatic and voluntary shoulder instability. On display outside of the newly named Carter R. Rowe, MD Conference Room you will find Dr. Rowe's signature surgical tools, a collection of historic photographs and his texts. Dr. Rowe will surely be missed and his impact on the MGH and the field of orthopaedic surgery will always be remembered.

#### CHILDREN'S HOLIDAY PARTY

Our now annual Children's Holiday Party delighted parents and kids alike in December for the second year in a row. We initiated the event to make the orthopaedic residency experience here at the MGH more oriented to the increasing number of residents and fellows with young families. We had over 80 people join us for this year's fun-filled party at the Boston Children's Museum on Congress Street. Of course, Santa and one of his elves were there to entertain the children and parents with stories, songs and gifts. The festivities included a lunch in the museum's private party room, followed by holiday cake and ice cream. Each of the children also went home with a personal professional photograph taken with Santa. After the great party, the afternoon was spent exploring the wonderful exhibits at the museum. Thanks to Dr. David Wimberly, PGY5, whose hard work and dedication to this event made it an outstanding success.

#### PERSONAL NOTE

My wife, Kimberly, and I finally feel like members of the Boston community. We have thoroughly enjoyed this last year in Weston, and it has been a sheer delight to watch my children Bradley (age 15), Steven (age 13), and Kristen (age 11) develop and flourish in the Weston School System. The move to Boston has given us an opportunity to understand and carefully evaluate the needs of all of the members of our family and our interdependence upon one another. I've begun once again to enjoy golf, and have thoroughly enjoyed the academics and athletics of our children in their various school activities. In addition, we have enjoyed our exploration of the Cape and the Islands areas with our new boat, *H.E.R. Dream*. This has been an exceptional addition to our summertime activities and has given us an opportunity to better appreciate the East Coast lifestyle. We look forward to many more years in Boston!



Conor Breen (Dr. Julie Katarincic's son) with Santa



Dr. Harry E. Rubash and his son, Steven, and Dr. Francis Hornicek and his daughter, Heather, enjoying the Children's Holiday Party

## Department of Orthopaedic Surgery, Massachusetts General Hospital

### Clinical Faculty

#### General Orthopaedics

**Brian J. Awbrey, MD**; Clinical Instructor of Orthopaedic Surgery, Harvard Medical School

**Joseph S. Barr, MD**; Assistant Clinical Professor of Orthopaedic Surgery, Harvard Medical School

**Fulton C. Kornack, MD**; Clinical Instructor of Orthopaedic Surgery, Harvard Medical School

**William Tomford, MD**; Professor of Orthopaedic Surgery, Harvard Medical School

#### Foot and Ankle Surgery

**George H. Theodore, MD**; Chief, Foot and Ankle Unit; Instructor in Orthopaedic Surgery, Harvard Medical School

**James Heckman, MD**; Instructor in Orthopaedic Surgery, Harvard Medical School, Editor-In-Chief Journal of Bone and Joint Surgery

#### Hand/Upper Extremity

**Jesse B. Jupiter, MD**; Chief, Hand Service; Professor of Orthopaedic Surgery, Harvard Medical School

**James H. Herndon, MD, MBA**; Chairman, Partners Department of Orthopaedic Surgery Partners Healthcare; Professor of Orthopaedic Surgery, Harvard Medical School

**Sang-Gil P. Lee, MD**; Instructor in Orthopaedic Surgery, Harvard Medical School

**David C. Ring, MD**; Instructor in Orthopaedic Surgery, Harvard Medical School

#### Arthroplasty

**Andrew Freiberg, MD**; Chief, Adult Reconstruction Surgery Service, Assistant Clinical Professor of Orthopaedic Surgery

**William H. Harris, MD**; Allen Gerry Clinical Professor of Orthopaedic Surgery, Harvard Medical School

**Dennis W. Burke, MD**; Clinical Instructor in Orthopaedic Surgery, Harvard Medical School

**Murali J. Jasty, MD**; Associate Clinical Professor of Orthopaedic Surgery, Harvard Medical School

**David W. Lhowe, MD**; Instructor in Orthopaedic Surgery, Harvard Medical School

**Harry E. Rubash, MD**; Chief, MGH Department of Orthopaedic Surgery; Edith M. Ashley Professor of Orthopaedic Surgery, Harvard Medical School

**John M. Siliski, MD**; Clinical Instructor in Orthopaedic Surgery, Harvard Medical School

#### Shoulder

**Jon J. P. Warner, MD**; Chief, Partners Shoulder Service; Associate Professor of Orthopaedic Surgery, Harvard Medical School

**Gary S. Perlmutter, MD**; Clinical Instructor in Orthopaedic Surgery, Harvard Medical School

**Robert D. Leffert, MD**; Professor of Orthopaedic Surgery, Harvard Medical School

**Peter Millett, MD**; Instructor in Orthopaedic Surgery, Harvard Medical School

#### Spine

**Francis X. Pedlow, MD**; Chief, Spine Service, Instructor in Orthopaedic Surgery, Harvard Medical School

**Frederick L. Mansfield, MD**; Instructor in Orthopaedic Surgery, Harvard Medical School

**Andrew Hecht, MD**; Instructor in Orthopaedic Surgery, Harvard Medical School

**James Sarni, MD**; Instructor in Physical Medicine and Rehabilitation, Harvard Medical School

**David Karli, MD**; Instructor in Physical Medicine and Rehabilitation, Harvard Medical School

#### Podiatry

**Robert J. Scardina, DPM**; Chief, Podiatric Service, Clinical Instructor in Orthopaedic Surgery (Podiatry), Harvard Medical School

#### Sports Medicine

**Bertram Zarins, MD**; Chief, Sports Medicine Service; Associate Clinical Professor of Orthopaedic Surgery; Harvard Medical School

**Arthur Boland, MD**; Assistant Clinical Professor of Orthopaedic Surgery, Harvard Medical School

**Thomas J. Gill, MD**; Instructor in Orthopaedic Surgery, Harvard Medical School

**Dinesh Patel, MD**; Assistant Clinical Professor of Orthopaedic Surgery, Harvard Medical School

#### Trauma

**Mark Vrahas, MD**; Chief, Partners Orthopaedic Trauma Services; Assistant Professor of Orthopaedic Surgery, Harvard Medical School

**Malcolm Smith, MD**; Assistant Professor of Orthopaedic Surgery, Harvard Medical School  
Associate Chief of Orthopedic Trauma Services

#### Oncology

**Henry J. Mankin, MD**; Chief, Orthopaedic Oncology Service; Edith M. Ashley Professor of Orthopaedic Surgery, Harvard Medical School

**Mark C. Gebhardt, MD**; Frederick and Jane Ilfeld Associate Professor of Orthopaedic Surgery, Harvard Medical School

**Francis J. Hornicek, MD**; Assistant Professor of Orthopaedic Surgery, Harvard Medical School

#### Pediatric Orthopaedics

**Brian Grottkau, MD**; Assistant Professor of Orthopaedic Surgery, Harvard Medical School, Chief of Pediatric Orthopaedics

### Fellows

#### Trauma

**Christopher Breen, MD**

#### Sports

**David Golden, MD**  
**Lars Richardson, MD**  
**Craig Title, MD**

#### Hand

**Gary Rogers, MD**  
**Kourosh Jafarnia, MD**  
**Simon Cornellison, MD**  
**Peter Pardubsky, MD**

#### Oncology Clinical

**James Hayden, MD**  
**Erik Zeegen, MD**

#### Oncology Clinical & Research

**Jeung Il Kim, MD**

#### Arthroplasty

**Arthur Mark, MD**  
**Amir Jamali, MD**  
**Danton Dungy, MD**  
**Steven Schule, MD**

#### Shoulder

**Thomas Holovac, MD**  
**Sonu Ahluwalia, MD**

#### Pediatrics

**Mark Sinclair, MD**

### Basic Science Faculty

**Lawrence Weissbach, PhD**; Assistant Professor of Orthopaedic Surgery, Harvard Medical School

**Arun Shanbhag, PhD**; Assistant Professor of Orthopaedic Surgery, Harvard Medical School

**Guoan Li, PhD**; Assistant Professor of Orthopaedic Surgery, Harvard Medical School

**David E. Krebs, PhD**; Lecturer on Orthopaedic Surgery, Harvard Medical School

**Chris McGibbon, PhD**; Lecturer on Orthopaedic Surgery, Harvard Medical School

**Teresa Morales, PhD**; Lecturer on Orthopaedic Surgery, Harvard Medical School

**Orhun Muratoglu, PhD**; Assistant Professor of Orthopaedic Surgery, Harvard Medical School

**Patricia Sullivan, PhD**; Lecturer on Orthopaedic Surgery, Harvard Medical School

#### Retired

**Donald Pierce, MD**; Associate Clinical Professor of Orthopaedic Surgery, Harvard Medical School