



# MASSACHUSETTS GENERAL HOSPITAL

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*The Orthopaedic Journal of Harvard Medical School* is now an annual tradition in the Harvard Combined Orthopaedic Residency Program. It has become an exceptional way to celebrate the many successes among the entire staff and to give readers the sense of community in our program. In particular, I'm pleased to give to you my third annual report and to reflect upon our significant accomplishments at the Massachusetts General Hospital.

### NEW CLINICAL FACULTY

It is a great pleasure to welcome Dr. Andrew Freiberg, Assistant Professor of Orthopaedics and Assistant Orthopaedic Surgeon back to the MGH. Dr. Freiberg completed his Residency in Orthopaedic Surgery at the University of Michigan and completed a Fellowship in Total Joint Arthroplasty at the MGH. He returned to the University of Michigan Hospitals as the Chief of the Adult Reconstruction Service and developed an outstanding Arthroplasty Service and reputation in the field of total joint replacement. Dr. Freiberg joined the MGOA in August 2000 and he is occupying the space vacated by Dr. Don Pierce on ACC 537. Dr. Freiberg said of his return to the MGH, "I'm delighted to be part of the Department of Orthopaedic Surgery. I have been welcomed back into a progressive and talented group of surgeons. As the newest member of the Adult Reconstructive Service, I hope to continue a strong tradition of patient care, education and research." Dr. Freiberg plans to develop an active arthroplasty practice and will be instrumental in helping us lead the



Dr. Andrew Freiberg

Knee Biomechanics and Biomaterials Laboratory. In addition, to his work in Arthroplasty, Dr. Freiberg has a keen interest in gene therapy for Rheumatoid Arthritis. He has published extensively in the area of adult arthroplasty and we welcome him to the Arthroplasty Service. We also welcome his wife Dee and his children, Stephen (age 9) and Benjamin (age 8).

It is also a great pleasure to welcome Dr. Julie Katarincic as an instructor in Orthopaedics and as an important new member of the Hand Service. Dr. Katarincic joined us in November 2000 from the Mayo Clinic where she was actively involved in pediatric and adult hand surgery and was an active participant in the Mayo residency training program. Dr. Katarincic completed her Orthopaedic Residency at Brown University and followed with a Fellowship in Hand

and Microvascular Surgery at the Mayo Clinic. She furthers the depth of the Hand Service and joins an already outstanding group of clinicians. Dr. Katarincic remarked, "Our family has had a wonderful experience being welcomed to the MGH and Boston communities. The Orthopaedic Department has such a strong presence, full of talented individuals on all levels. It is exciting to be a member of this group and I hope to contribute to the continuing growth of the Department."

In addition, she will be working with the Pediatric Orthopaedic Service as well with the Shriners Hospital. We welcome Dr. Katarincic to Boston with her husband, Dr. Chris Breen, Fellow in the Sports Medicine Service as well as her two children, Conor (age 3) and Courtney (age 1).



Dr. Julie Katarincic



Dr. Andrew Hecht

It is also with great pleasure that we welcome Dr. Andrew Hecht back to the MGH. Dr. Hecht will be joining the Spine Service in August, 2001. Dr. Hecht trained in the Harvard Combined Orthopaedic Surgery Residency Program. He was an outstanding Chief Resident at MGH and is completing a Spine Fellowship at Emory University Spine Center in Atlanta. Dr. Hecht's areas of clinical interest include cervical spine surgery and spine trauma. His research interests are in the areas of the biology of the intervertebral disc and the pathophysiology of disc degeneration. Dr. Hecht will be an integral part of the expanding MGH Orthopaedic Spine Center. We welcome Dr. Hecht to Boston with his wife, Dr. Sonia Nagy Hecht, an Infectious Disease Specialist who will be joining the staff of the Beth Israel/Deaconess Medical Center as an HIV Specialist.

In addition, to these latest members of the MGH Orthopaedics team we are actively recruiting a new Pediatric Orthopaedic Surgeon. Also, we hope to have a new member of the Partners Trauma Service in the near future.

### ADMINISTRATION

In 1999 we welcomed David Gaynor, our new Administrative Director of the Orthopaedic Service. Mr. Gaynor has been an outstanding asset to the practice and plays a pivotal role in implementing changes to improve efficiencies in the

Department. He is working on assembling an increasingly outstanding administrative team to help him with these many functions and the heavy demands of our increasing admissions, surgeries, and visits. Mr. Gaynor is actively involved in the planning and strategic development of the MGH Orthopaedic website, which will be undergoing renovation in the coming months. Mr. Gaynor reports, “we have recently begun a project to overhaul the Department website in accordance to changes with the MGH main site and will be instituting new plans and formulas directed at advancing the use of the site both within the MGH community and outside.” Mr. Gaynor has been instrumental in reorganizing the Trauma Practice in the Ambulatory Care Building, and making the many necessary moves to accommodate our new practitioners. He’s a thoughtful, insightful individual who adds great depth to the Department and its administrative activities. Mr. Gaynor commented on his time here, “the Department of Orthopaedics has experienced significant growth and development over the last two years. It is an exciting process to watch the expansions and reorganizations that have been the hallmark of success within the Department. I feel fortunate to be a part of this organization and I look forward to a long tenure here.” In addition, Mr. Gaynor has been an instrumental voice, along with myself, in the planning and development of a new Ambulatory Care Center, which I will discuss later in this report. I look forward to Mr. Gaynor’s many significant contributions to our Department.

The administration team has seen some additional changes with the recent retirement of Rosalie Martin, Administrative Director for Finance. Her wonderful personality and tremendous experience will be sorely missed. We are pleased though, that we will benefit from her expertise on occasional special projects.

This year we welcomed Karen M. Bernstein, Clinical Research Editor, to the Department. Ms. Bernstein came to us after seven years with the Science and Publications Department of the American Society of Clinical Oncology (ASCO). Ms. Bernstein will be dividing her time between supporting the editorial side of my research work and serving as the content editor, developer and author of the Department’s new web page. I am pleased to have Ms. Bernstein onboard in the department and as a ringer on my team for the Annual Harvard Golf Outing.

### **AMBULATORY CARE BUILDING**

The Partners Finance Committee recently approved two new buildings to be added to the Massachusetts General Hospital. One will be a new Cancer Center near Cambridge Street and the other a 200,000 square foot new Ambulatory Care Building over the Proton Beam Area. These two new buildings which are being constructed over the next three years will add immensely to the clinical activities of the institution. The Orthopaedic Department will be a proud occupant in the new Ambulatory Care Building and will most likely occupy two floors and 44,000 square feet with the opening of a new MusculoSkeletal Institute. We anticipate new practice modules

with centralized radiology services, as well as expanded waiting areas, minor procedure rooms, and new offices for our practitioners. A massive fund-raising activity is underway to raise 90 million dollars of philanthropy toward this project. I feel that the new building combined with our outstanding commitment to patient care will make the new MGH building second to none. In addition, this facility will give us an opportunity to co-locate with other services that deal with the same patient population and to develop a closer relationship with Rheumatology, Physical Medicine and Rehabilitation, Pediatrics, and Women’s Health. It will also give us an opportunity to obtain new economies, and to co-locate with important functions in Radiology. 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. Mr. Gaynor, Dr. Andrew Freiberg and the administrative staff have been instrumental in the coordination of the many activities in the new building.



MGH New Millennium

### **NEW PRACTICE MODEL**

At this point our new practice model has been fully instituted. We now utilize combined surgical and test scheduling, academic support services, nurse practitioners and physician’s assistants to improve our overall efficiencies and patient satisfaction.

The Massachusetts General Hospital Orthopaedic Associates (MGOA) now has control over our complete revenue cycle. Tom Amerault, the new Director of the Orthopaedic Billing Office has created an outstanding billing office with personnel deployed in the appropriate billing areas. In addition, we will be hiring a new billing liaison to work with high-volume practices in the group. Mr. Amerault reports, “through the collaborative efforts of the whole Department, reimbursement will be maximized.” The billing office has officially moved to its new location and I am hopeful that we will benefit from the new deployment of the IDX System at the MGH.

Our clinical and surgical activities continue to grow. We have greatly increased our capacity for patients in all practice

locations and have been able to incorporate the new physicians into our relatively tight clinical areas. Dr. Mark Vrahas, the new Partner's Chief of Orthopaedic Trauma and Lillian Figueroa, have reorganized the Trauma activities in the ACC 525 area. Dr. George Theodore has moved the Foot and Ankle Service to Dr. Robert Boyd's former office at ACC 503. This expanded space will accommodate new administrative and research functions for the Foot and Ankle Service and provide space for Dr. James Heckman, the new editor of the *Journal of Bone and Joint Surgery* (JBJS), in the Foot and Ankle Service area.

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

Major strides have been made in the operating rooms at the MGH over the past year. We have fully implemented a new Orthopaedic Trauma Room. In addition, through the efforts of the Operating Room Operations Improvement Committee, we hired a new nurse manager for the Orthopaedic Service, and have also hired an additional equipment manager. Furthermore, we have also acquired much needed additional time in the main OR and in the same day unit. Additionally, we have ordered over \$350,000 worth of equipment this year (\$850,000 over the past 3 years) to further facilitate our on time case starts, decrease our turnover, and to upgrade and improve our equipment status. In the near future we will be expanding the length of the operating room day for Orthopaedic Operating Rooms, and adding additional rooms in the same day unit. I would like to thank Drs. J.P. Warner, Bill Thomford, and Mr. David Gaynor for their outstanding contributions.

#### **SERVICE UPDATES**

##### **ADULT RECONSTRUCTIVE SURGERY SERVICE**

The Adult Reconstructive Surgery Service at the MGH led by Dr. William Harris is our most active inpatient division within the department. With the addition of Dr. Andrew Freiberg we expect further growth in the clinical area. Dr. Freiberg's focus on revision total joint arthroplasty and his keen interest in knee arthroplasty will add needed depth to the service. Dr. Harris agrees, "This has been a particularly eventful year for the Adult Reconstructive Service. The return of Andy Freiberg to the staff strengthened and enriched our facility." The renowned Harris Hip Course and the Harvard Knee Course continue to highlight CME activities on the Adult Reconstructive Surgery Service. My own practice continues to grow and I look forward to further clinical activity.

The introduction of electron beam cross-linked polyethylene to the marketplace has begun a new revolution in total joint arthroplasty. With its extremely low-wear characteristics it offers new opportunities in the area of total hip arthroplasty with expanded head size and joint stability. The cross-linked polyethylene may permit new opportunities in primary and revision total knee arthroplasty and unicompartmental arthroplasty. Dr. Harris said, "on the research front the singular event was FDA approval of the electron beam cross-linked polyethylene for use in total knee replacement surgery." This compound is being looked at in a variety of other joints throughout the body and will be opening remarkable vistas for total joint replacement surgery. Congratulations to Dr. William

Harris and his team for this most important contribution. It is a pleasure to announce that Dr. Harris was recently honored as the recipient of the Maurice Muller Award. He traveled to Switzerland to receive this highly coveted citation.

Fundraising efforts have begun to endow the first Hugh P. Chandler Adult Reconstructive Fellowship at the MGH. I am pleased to announce that we are well on our way to making this a lasting contribution to the Adult Reconstructive Surgery Service at the MGH. Dr. Chandler continues to improve and is spending a great deal of time traveling and sailing.

#### **WILLIAM H. HARRIS Festschrift CELEBRATION**

In May, The Partner's Department of Orthopaedic Surgery and the MGH hosted a Festschrift celebrating the achievements of an extraordinary surgeon, teacher, and scientist, Dr. William H. Harris. Translated from the German, *fest* means *celebration* and *schrift* means *writing*. A festschrift celebration is a series of presentations and a volume of writings by different authors bestowed as a tribute - especially to a scholar. The program participants included former students of Dr. Harris and colleagues who truly comprised an intercontinental "who's who" of experts in joint reconstruction. We were privileged to see an extraordinary array of scientific presentations which spoke to the depth and breadth of the research and clinical achievements of Dr. Harris. We look forward to the publication of the Proceedings of the Scientific Event that will appear as a Supplement to the Journal of Arthroplasty. In addition, this event also inaugurated the William H. Harris Annual Lectureship. The lectureship will cover important developments in orthopaedic surgery and arthroplasty. We were pleased this year to have Dr. William Maloney, Charles F. and Joanne Knight Distinguished Professor at Washington University and Chief of the Orthopaedic Surgery Service at Barnes-Jewish Hospital, as the first presenter of The William H. Harris Lecture, with his talk on, "Cartilage Repair Using Tissue Engineering and Gene Therapeutic Techniques."



Dr. William Maloney and Dr. Harry E. Rubash



The culmination of this special event was marked by the establishment of the William H. and Johanna A. Harris Chair in Orthopaedic Surgery. This crowning achievement is demonstrative of the wide impact Dr. Harris' career has had on Orthopaedic Surgery. The William H. and Johanna A. Harris Chair in Orthopaedic Surgery will serve as a testament to Dr. Harris' commitment to education, and research. Congratulations to Dr. Harris on this fine legacy. Dr. Sam Thier, CEO and Chairman of Partners HealthCare System announced Dr. James H. Herndon, Chief of Partners Orthopaedics, as the first recipient of this esteemed position. As the inaugural recipient of The William H. and Johanna A. Harris Chair in Orthopaedic Surgery, I am certain that Dr. Herndon's

tenure will mark a long tradition of excellence and accomplishments here in the Harvard Orthopaedic Program. "It is a real honor to hold the Chair of a man with such a distinguished record of contributions to orthopaedics and reconstructive hip surgery. Dr. Harris was one of my teachers and it is especially rewarding, to be given a Chair in his name," said Dr. Herndon. In





addition, we are delighted to announce that Alan Gerry has generously established the Alan Gerry Scholarship fund, equal to that of a Chair at Harvard Medical School.

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

Under the direction of Dr. George Theodore the Foot and Ankle Service on ACC 5 has experienced exceptional clinical growth in the past year. The Service continues to be at the forefront for treating cartilage injuries to the ankle and foot. There have also been contributions in the area of post-traumatic reconstructions, including fusions and osteotomies. Dr. Theodore reports, “the Foot and Ankle Service is dedicated to the development of innovative and minimally invasive techniques for the treatment of adult foot-ankle problems. Our current treatment emphasis is on cartilage injuries, arthroscopic surgery, tendon reconstructions, and osteotomies.” Recent research activities include a study on shock-wave therapy for plantar fasciitis, which moved from clinical trial to clinical use this spring. The Service is looking forward to the addition of a Fellow, and a new attending, in the near future. Close collaboration with the Podiatry Service is also underway.

#### **PODIATRIC UNIT**

The Podiatric Unit at MGH is nationally recognized for clinical care and post-graduate education. As Director of Podiatric Medical Education, Dr. Robert J. Scardina is planning development of an additional Residency Training year (PGY III), which would collectively lead to Board qualification for

MGH graduates in all three Podiatric sub-specialties (primary medicine, orthopedics and surgery).

The MGH Podiatric Unit and MGH Podiatric Associates, emphasize a continuum of foot care with attention to quality, cost efficiency, high clinical volume and state-of-the-art treatment. Dr. Scardina reports, “MGH Podiatry has made remarkable progress in patient care and post-graduate education and training. Additional Orthopaedic Department and Hospital support will predictably lead to further growth, development and refinement within all areas of our practice.” The Podiatric Unit has realized growth in outpatient volume by over 10% throughout the last year, with additional access to services at the Main Campus as well as all three affiliated Health Centers practices. Dr. Scardina and the entire Podiatric Unit staff should be congratulated for recently achieving an additional five-year approval status for the Residency Program(s), as a result of a successful Council on Podiatric Medical Education site visit. The Podiatric Unit has worked closely with the Orthopaedic Department for over two decades.

#### **HAND SERVICE**

The Hand Service led by Dr. Jesse Jupiter continues to be the busiest service in the outpatient unit at the MGH and has seen a great increase in the number of patients treated. The Service has been greatly expanded by the additions of Dr. David Ring, and Dr. Julie Katarincic. Dr. Ring who we welcomed last year has a burgeoning practice. They both will continue to strengthen the ties with the Trauma Service and the Pediatric Orthopaedic Service and will greatly broaden the research interests in the unit including expanding the area of microsurgical reconstruction. Dr. Jupiter reports that, “our Hand Service has achieved an international reputation as a center of excellence for the care of problems involving the upper limb. In particular we are a renown center for the reconstruction posttraumatic problems of the wrist and elbow and of microsurgical reconstruction of the extremities.” The important AO Foundation Grant has recently been renewed and is being used to develop a Center of Excellence for Hand and Upper Limb Trauma and Reconstructive Problems at the MGH. Renovations of the Hand Service clinical area are underway on ACC 5.

## SHOULDER SERVICE

The Partners Shoulder Service is lead by Dr. Jon J.P. Warner and is housed at the Physicians Office Building. This Service continues to grow exponentially with over 500 shoulder surgeries being performed annually. In addition to prolific clinical activities, over 4,000 patients are seen by the Service per year, Dr. Warner is running a first rate shoulder laboratory concentrating on the area of shoulder stability. A strategic recruitment is underway to further expand the clinical activities of the Shoulder Service. Dr. Warner reports, “the growth in Clinical volume and academic productivity has been very exciting over the past year. An additional surgeon will soon join this service to expand our ability to meet our goals of clinical excellence and academic advancement.”

A number of prospective clinical outcome studies have been initiated and collaborative research projects continue with departments including Physical Therapy, Radiology and Anesthesia. The Service’s education programs also continue to thrive. More than 20 foreign physicians have visited as Traveling Fellows to the Harvard Shoulder Service. In addition, the Intercontinental Shoulder Fellowship Program in collaboration with the University of Zurich has become one of the most sought after Post-Graduate Fellowships in the world.

## ONCOLOGY

It is a pleasure to announce that the Orthopaedic Oncology Service at the MGH is under the new leadership of Dr. Francis Hornicek. Dr. Hornicek reports, “the Orthopaedic Oncology Unit is one of the busiest in the country if not the world. With the leadership over the years of Dr. Mankin the Service has reached its current outstanding reputation. Dr. Mankin, Dr. Gebhardt, and I trust that this tradition will continue in the future.”

Dr. Hornicek’s outstanding clinical expertise and his many contributions to the Orthopaedic Training Program and Fellowship are greatly appreciated. The Service continues its involvement in CME courses of Pathophysiology of Orthopaedic Disease and the publication of numerous clinical and research reviews. The Connective Tissue Oncology Clinic (CTOC) works closely with medical and radiation oncologists, radiologists, bone pathologists and other integral medical personnel and services to provide the most optimum care for patients. Dr. Mark Gebhardt, President of the Musculoskeletal Tumor Society, whose base has been at Children’s Hospital, is spending more time at the MGH to help with the pediatric tumor cases. Dr. Gebhardt has been an outstanding member of the service and we greatly appreciate his many contributions to the Residency Program. I look forward to Dr. Hornicek’s many contributions to the area of musculoskeletal neurology

## PEDIATRIC ORTHOPAEDIC SERVICE

MGH recently celebrated the opening of the new Massachusetts General Hospital for Children. With the establishment of this new hospital within a hospital, the Pediatric Orthopaedic Service will be called upon to provide further leadership in the expanding area of pediatric care at the

MGH. Dr. David Zaleske reports, “the formation of the Mass General Hospital for Children has been a wonderful event this year. This crystallizes our many activities for children at the MGH. Dr. Alan Ezekowitz, Chief of Pediatrics, and Dr. Rubash work even closer and the children benefit. The MGH Pediatric Orthopaedic Service is undergoing an adolescent growth spurt.” The Hospital is giving a name to and reaffirming what has always been a commitment to outstanding service and care. This unique setting will serve as a bridge to even further connect services in the area of pediatric care. The Pediatric Orthopaedic Service continues to increase its role with the MGH Health Centers and to further collaborations with the Boston Shriners Hospital for children. It’s great to have Dr. Zaleske expanding his clinical practice.

We wish Dr. Keith Mankin the best in his new home in the Raleigh-Durham area. Dr. Keith Mankin decided to leave the MGH in January of 2001 and pursue a private pediatric orthopaedic practice in North Carolina. Dr. Keith Mankin’s pediatric practice had grown tremendously over the past couple of years and he will be greatly missed. We anticipate having a new faculty member onboard by the summer of 2001.



Dr. Henry Mankin and Dr. Keith Mankin

## SPORTS MEDICINE

The Sports Medicine Service at MGH continues to grow and prosper both in the clinical as well as the research realm. The program is under the skillful leadership of Dr. Bert Zarins, who has a long-standing history as a leader in the area of sports medicine. In addition to an association with the New England Patriots Football organization, the Boston Bruins, and the New England Revolution Soccer team, the service is now participating in the care of the new professional woman’s soccer league team, the Boston Breakers. The Service provides care for many local collegiate and high school athletic programs. Reports Dr. Zarins, “the MGH Sports Medicine Service provides evaluation, treatment, and rehabilitation of injured athletes who participate at all levels of activity: recreational, amateur, professional and elite. Our physicians provide medical care for four professional sports teams, two colleges and two high schools. Our main research activities include biomechanics of the post cruciate ligament, muscle injuries and photodynamic therapy.” Dr. Tom Gill through

a grant from the National Football League Charities, is actively pursuing his research interests on posterior cruciate ligament reconstruction with Dr. Guoan Li in the Robotic Joint Kinematics Laboratory. Dr. Gill also has a CIMIT Grant for biological meniscus repair. Dr. Dinesh Patel continues to excel in the area of arthroscopic learning programs for our residents and fellows. A recent learning center program for the Residents and Fellows was a wonderful success. The Sports Medicine Fellowship is an outstanding one and has recently increased in its size.

### **SPINE CENTER**

The MGH Orthopaedic Spine Center is now in its second year of existence. Drs. Frank Pedlow, Fred Mansfield, and our new edition, James Sarni, staff the multidisciplinary Spine Center. The Center is committed to offering timely evaluations and highly organized treatment protocols for all spinal disorders. In terms of clinical research the Service is working to develop and evaluate materials and designs for prosthetic and lumbar disc replacement. The Service is also involved in studies concerning spine reconstruction and fusion promotion. In addition, Dr. Guoan Li and the new Robotic Joint Kinematics Laboratory is collaborating with the Spine Center to further understand the biomechanics of the spine. We are anxiously awaiting the arrival of Dr. Andrew Hecht who will join the Spine Service in August 2001. The Spine Service is one of the busiest in New England and also serves as an international referral center for tumors of the spine and complex spinal reconstructions.

### **TRAUMA SERVICE**

The Partners Orthopaedic Trauma Service under the skillful direction of Dr. Mark Vrahas has been a continuing success at the MGH. Dr. Vrahas reports that, "support for the Trauma program from MGH, BWH and Partners affiliate hospitals has been outstanding." Through an extensive outreach program, the Service has positioned itself as the premier trauma service in the New England area. Dr. Malcolm Smith, a Consultant Surgeon, from the Department of Trauma and



**Dr. Malcolm Smith**

Orthopaedic Surgery at St. James' University Hospital in Leeds, UK will be joining the Partners Trauma Service in August of 2001. It is a distinct pleasure to welcome Dr. Smith to the Partners Trauma Service. He brings additional expertise and experience in the treatment of patients of orthopaedic trauma. Dr. Vrahas agrees, "with the addition of further staff this year we are on line to become a premier center for the care of orthopaedic trauma."

The Trauma Service recently initiated a research study on the efficacy of autograft versus a bone substitute for closed tibio-plateau fractures. In addition there has been recent grant activity with projects on "The Relationship between Chondrocyte Apoptosis and Post-Traumatic Arthritis in Humans," and "Transitional Research Gene Therapy for Fracture Healing –

Bench to Clinic." The volume of this Service continues to grow and the Chief Residents should be congratulated for their considerable efforts. The Trauma Service Morning Report has been a great success and we are pleased to announce that the Trauma Service recently won a Partners in Excellence Award for their integrated efforts with Spaulding Rehabilitation Hospital. In addition, the Partners Trauma Service recently received their American College of Surgeons Level I Adult and Pediatric Trauma Accreditation.

### **RESEARCH UPDATES**

The faculty and staff of the research laboratories have begun a reorganization of the MGH Orthopaedic Research Laboratories. Dr. Orhun Muratoglu has been assigned Chair of the new Executive Committee on Orthopaedic Research. Dr. Muratoglu along with committee members, Drs. Francis Hornicek and Teresa Morales, will be dealing with all laboratory activities. One of the first charges I have given the Committee is to develop a template and a working five-year plan document for all of the Orthopaedic Research Laboratories at the MGH. In addition, this new Committee will be instrumental in the allocation of the new research space that will soon be available on Jackson 12.

Once again the scientists of the various laboratories were extremely well represented at the Orthopaedic Research Society (ORS), with 20 podium and 28 poster presentations. Dr. Stephen Trippel, the 2001 ORS Chairman and I, ORS Treasurer, have been quite active on the Society's Board. I look forward to further participation from other members from our laboratories in the ORS. The monthly MGH Laboratory Lecture Series has been an outstanding success. Recent speakers have included, Drs. Gordana Vunjak-Novakovic, Stephen B. Trippel, Julie Glowacki and Karen E. Yates. The Series has moved from the Clinic's Amphitheatre to the recently renovated Ether Dome Amphitheatre. In addition, we are able to watch the progress of a new mural documenting the first public demonstration of anesthesia during surgery, which took place in 1846 at the MGH. The Ether Dome Mural Project is being painted by renowned Boston artist, Warren Proserpi and depicts a historically authentic rendition of the scene of the first application of ether. It is fascinating to watch a great artist at work and we look forward to the official unveiling ceremony on Ether Day 2001.

Dr. Chris Evans has been instrumental in the development of the new Center for Molecular Orthopaedics in the Partners Orthopaedics Department. Dr. Evans reports, "The Center for Molecular Orthopaedics aims to develop molecular solutions to orthopaedic problems. Gene therapy is the major, but not exclusive, area of interest. During its first year of existence, the CMO has established and staffed a laboratory in the Lying In building on Longwood Avenue. In the coming year, it is hoped to establish a similar presence at MGH. Together, these two laboratories will facilitate the

translation of bench research into novel clinical interventions." We will be hiring a new molecular biologist that will work with the CMO laboratories in new MGH Jackson

12 research space. I'm hoping that this new individual will collaborate closely with the clinicians in the MGH to explore this highly important and exciting new area of molecular orthopaedics. Dr. Evans is an extremely productive individual is flourishing in the Boston research environment. We all look forward to the many contributions from the Center for Molecular Orthopaedics.

### **ORTHOPAEDICS BIOMECHANICS AND BIOMATERIALS LABORATORY**

The Orthopaedics Biomechanics and Biomaterials Laboratory is under the direction of Dr. William Harris. This laboratory has developed numerous significant contributions to the world of total joint arthroplasty. The Laboratory has been responsible for clinical contributions in the area of cement technique, instrumentation for total joint replacement, total hip and total knee implant design, and a new electron beam cross-linked polyethylene (*Longevity*<sup>TM</sup> Zimmer, Inc., Warsaw Indiana), *Durasul*<sup>TM</sup> Sulzer Orthopedics, Austin Texas), that most likely will revolutionize the area of total hip arthroplasty. This laboratory has collaborated closely with other laboratories within the institution as well as the Massachusetts Institute of Technology (MIT). Currently, the newly developed polyethylene is being used in total hip arthroplasty and it has been approved for total knee replacement. It is our hope that the new polyethylenes will be available for other joint arthroplasty sites. In addition, a very active program is underway looking at osteogenic substances and their ability to repair osteo-defects. The many contributions of Dr. Orhun Muratoglu, Chair of the Executive Committee on Orthopaedic Research, Dr. Murali Jasty, Dr. Dan Estok, Danny O'Connor, Charlie Bragdon, Edie Weinberg, and many others have made this laboratory one of the premier Biomechanics and Biomaterials Laboratory in the country. Dr. Harris said, "we also greatly benefited from the presence of Henrik Malchau from Goteborg, Sweden as a Visiting Research Scientist for the year, contributing to our rapid development in RSA." In addition, he reports, "we have also launched an electronic relational, Intranet Database for gathering data for outcomes studies." The laboratory was well represented at the ORS and we anticipate further significant contributions.

### **BIOMATERIALS RESEARCH LABORATORY**

The Biomaterials Research Laboratory located on Jackson 11 is under the direction of Dr. Arun Shanbhag. This Laboratory utilizes a multi-disciplinary approach to investigate complex orthopaedic biomaterials questions, and is focusing on comprehensive investigations of periprosthetic osteolysis using the newest cellular and molecular biological techniques. A grant to study the genetic markers for arthritis was recently received. In addition, the Laboratory has also received a NIH-RO3 Grant to study the anabolic effects of bisphosphonates.

This Laboratory will continue to provide unique opportunities for scientists, residents, fellows and staff and is an integral part of the future of Orthopaedic Research at MGH. Dr. Gun Il Im, Mark Neavyn, Laboratory Technician, Sheeraz Qureshi, Jean-Pierre Phancaso, and Mara Meyer, should all

be recognized for their dedication and many contributions. A congratulation goes to Arun Shanbhag who recently was accepted to Boston University's intensive Executive MBA Program. In addition congratulations to the Laboratory team for their well received ORS papers and presentations.

### **KNEE BIOMECHANICS AND BIOMATERIALS LABORATORY**

The Knee Biomechanics and Biomaterials Laboratory is another integral part of the Orthopaedic Biomechanics and Biomaterials Laboratories at the MGH. The Laboratory is now located on Jackson 11 and is continuing to study component wear after total knee arthroplasty and the effects of component alignment on implant wear. The Laboratory utilizes a multi-disciplinary approach including finite element analysis, computerized modeling, and knee-wear simulators. Investigators in this Laboratory are studying the complex interactions between the tibiofemoral joint, the patellofemoral joint, and the effects of alignment and rotation on knee function and wear. This Laboratory is under the direction of Dr. William Harris and myself and draws upon the expertise of numerous members of the Orthopaedics Biomechanics and Biomaterials Laboratory. In addition the laboratory works closely with the Joint Kinematics Laboratory directed by Dr. Guoan Li.

### **JOINT KINEMATICS LABORATORY**

The new Joint Kinematics Laboratory is under the direction Dr. Guoan Li. Dr. Li and his fellow scientists interact closely with clinicians in the Orthopaedics Department. This Laboratory uses a sophisticated robotic joint simulator to understand complex kinematics and biomechanics of the musculoskeletal system. This Laboratory has important subdivisions, which include the Hand and Upper Extremity Module, the Athletic Reconstruction Module, the Total Knee Arthroplasty Module, and a newly developed Spinal Mechanics Module. Dr. Li explains, "The Joint Kinematics Laboratory utilizes the most recent technological advances to delineate the joint function. We are interested in the biomechanical factors that lead to joint

Robotic joint simulator



injuries and long-term joint degeneration. We also examine the biomechanical effects of current surgical options used to treat these injuries and devise new techniques.” Congratulations to Dr. Li on his podium and poster presentations this year at the ORS as well as on his recent OREF Grant in collaboration with Dr. Tom Gill to investigate the effect of ligament injuries on patellofemoral joint function. Dr. Li also has received a second OREF Grant with Dr. James Herndon entitled, “Interosseous Ligament (IOL) Reconstruction in Forearm Fracture - An in-vitro Experimental Study Using Robotic Technology”. Dr. Li is highly qualified to carry out the mission of this fine laboratory.

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

The Orthopaedic Biology and Oncology Laboratory under the direction of Dr. Henry Mankin has studied the area of normal and osteoarthritic cartilage for many years. Dr. Mankin explains the Laboratory’s focus, “the Orthopaedic Biology and Oncology Laboratories continue to explore the problems of the causes and treatment of osteoarthritis. We have an interest in both the factors that cause cartilage to grow and the degradative cascade that leads to destruction of the tissue and poorly functioning joints. We are also continuing to seek factors which may serve as predictors of metastasis in malignant bone and soft tissue tumors both by biochemical studies and by flow cytometric analyses of DNA structure and division.” This Laboratory is funded through NIH Grants as well as Orthopaedic Research Education Foundation Grants and a corporate sponsored grant. Dr. Christine Towle and the investigators in the Laboratory, are studying the effects of static compression on IL-1 metabolism in cartilage, and the mechanisms involved in TGF beta effects on aggrecan catabolism. Dr. Towle, reports, “There is immense interest in biology-based strategies to interfere with the loss of articular cartilage.” In addition, they are investigating the area of chondroprotective effects of light on photosensitive cartilage, and intracellular roles for IL-1 in osteoarthritis. Drs. Henry Mankin, Christine Towle and co-workers should be congratulated on their contributions to the Orthopaedic Research Society meeting.

### **SARCOMA MOLECULAR BIOLOGY LABORATORY**

The new Sarcoma Molecular Biology Laboratory, located on Jackson 11, has opened to support the research efforts of Dr. Francis Hornicek, and Dr. Lawrence Weissbach. Dr. Hornicek reports, “the Sarcoma Molecular Biology Laboratory is part of the biologic section of the MGH Orthopaedic Research Laboratories. It has been established to investigate new possible agents for treating cancer and to clarify their mechanism of action”.

The Orthopaedic Research Laboratories at MGH have a longstanding interest in cancer research, as exemplified by the important work on chondrosarcoma metabolism studies carried out by Dr. Henry Mankin, and tumor suppressor genes in osteosarcoma, performed by Dr. Mark Gebhardt. The Sarcoma Molecular Biology Laboratory consolidates different

aspects of musculoskeletal tumor research, with a focus on molecular and cellular aspects of different sarcomas, including investigation of novel chemotherapeutics, mechanisms of drug resistance, and antiangiogenesis therapy. Assessment of the in vitro and in vivo potential of novel antiangiogenic and chemotherapeutic agents on sarcoma cell growth is being carried out, for certain sarcomas do not respond well to conventional cancer treatments. The laboratory currently houses two research fellows, Dr. Hideo Morioka, is exploring the mechanism of action of a novel antiangiogenesis agent and Dr. Li Shao who is interested in a novel marine-derived chemotherapeutic agent for sarcomas. Dr. Lei Cai is a technician supporting studies on the effects of antiangiogenic compounds on normal cells. I look forward to the many important contributions from this laboratory.

### **LABORATORY OF ORTHOPAEDIC BIOCHEMISTRY AND OA THERAPY**

Dr. Teresa Morales, is continuing her important work on the investigation of growth factor regulations of osteoarthritic cartilage. Dr. Morales, explains, “the main goal of our studies is to provide fundamental knowledge of selected areas of the cell biology and biochemistry of cartilage that are likely to yield fertile soil for the development of approaches and technology for bioengineering of osteoarthritic tissues into a repair modality”. Dr. Morales’ research has been recently supported by the National Institute on Aging (NIA) and is currently funded by The National Institute of Arthritis, Musculoskeletal and Skin Diseases (NIAMS) and the National Arthritis Foundation. The keen areas of interest in this laboratory are the engineering of chondrocyte migration to disperse into and populate cartilage so as to promote repair and the investigation into Insulin-like growth factors binding proteins. She is also working in collaboration with bioengineering researchers, Drs. Douglas A. Lauffenburger, and Alan Grodzinsky from MIT. Dr. Morales has been recently named chair of the Cell Biology Study Section of the National Arthritis Foundation. In addition, she has also been a member of the Peer Review Council of the Arthritis Foundation for several years. Dr. Morales had a podium presentation at the ORS entitled, Insulin-Like Binding Proteins in Fresh Human Cartilage: Study of Normal and Osteoarthritic Samples,” and has two new grant applications with the NIH. In the near future we will be moving this laboratory to Jackson 12.

### **BIOMOTION LABORATORY**

The Biomotion Laboratory is directed by Dr. David Krebs, and is located in Ruth Sleeper Hall. The Lab investigates the mechanical and neural constraints of human locomotion. There are two distinct research areas in the Biomotion Laboratory: Balance/Inner ear Cerebellum problems and Arthritis/DJD. For the former the Biomotion Laboratory works closely with the Neurology Service. In collaboration with the Department of Orthopaedics, the Laboratory has developed an in vivo model of acetabular geometry and wear patterns based on pressure measurements from a subject with an instrumented femoral athroplasty. They have also developed MRI techniques

that accurately reconstruct anatomically correct 3D acetabular cartilage thickness. The Biomotion Laboratory has many interests in common with Orthopaedics. A new study is underway to study functional practice versus strengthening for knee arthritis patients and Dr. Krebs says of this collaboration, “The Biomotion Lab has enjoyed a strong relationship with our parent Department, Orthopaedics, since its conception in 1984. Currently more than five attending Orthopaedists are funded on or working with our research projects.” Dr. Krebs and the Laboratory should be congratulated for publishing over 20 research articles throughout the past year. In addition they have three US Patents pending.

### **FREDERICK AND JOAN BRENGEL LEARNING CENTER**

We were saddened in October by the death of benefactor, Frederick Brengel, a devoted friend of the MGH. Last year we established through the generosity of the Brengel Family, The Frederick and Joan Brengel Learning Center. The MGH named this center in appreciation of their overwhelming generosity. Mr. Brengel was the retired Chairman of Johnson Control Systems, a major manufacturer of thermostats and temperature monitoring devices. He and his wife resided in Milwaukee and in Jupiter Island, Florida. I am lucky to have come to know the Brengel’s and to experience the depth of their generosity and their concern for the future of medicine. The endowment of the Brengel Resource Learning Center is a strong legacy to the Department and the MGH in furthering the education of orthopaedic residents and fellows.



Frederick and Joan Brengel shown with Drs. Harris and Mankin

The Frederick and Joan Brengel Learning Center has been a tremendous new resource for the residents, fellows, and staff at the MGH. The Center includes the beautifully renovated Smith-Peterson Library. Volumes housed here include the traditional material in the Smith-Peterson Library as well as those from the personal library of Dr. James Herndon and myself. This extensive library in one of the finest in orthopaedic surgery and is an extremely important resource in the training program. In addition, the Smith Resident Education Center as well as the new reading room are completely renovated and include new workstations, multi-media equipment, and a place for our new librarian. Finally, we are able to utilize our newly



Dr. David Golden utilizing one of the new computer workstations in Frederick and Joan Brengel Learning Center

created and yet unnamed conference room, which includes a state-of-the-art projection system and other materials, which will serve our staff, residents and physicians very well.

### **AOA ABC TRAVELING FELLOWS**

This past year, in addition to hosting Fellows from the Hellenic Orthopaedic Association, and The Japanese Orthopaedic Association we had a wonderful time with the AOA ABC Traveling Fellows. This year’s Fellows group included: Jegan Krishan, Evelian Burger, Khalid Mohammed, Grey Giddons, Feral Monsell, Mike Robinson, and Joahn Witt. They had a broad range of interest from pediatric orthopaedics to sports medicine. The Fellows were able to present their research papers to the group and we had a highly interactive didactic session with them. I would like to thank the members of the faculty and staff who put a great deal of time and effort into making this a wonderful visit for the ABC Fellows.

This year we began a new tradition at the MGH Orthopaedics Department, when we sponsored a Children’s Holiday Party for families and friends in a private party room at The Boston Children’s Museum. Dr. Shawn Hayden recalls how the idea for the Holiday Party developed, “Dr. Rubash was speaking with several Residents and Fellows during a Clinic Break in the fall and there was some discussion on how we might make the training experience more oriented to the growing number of Residents and Fellows with families. The idea of a Children’s Holiday Party was presented. Not only was the initial response positive, but by the time the deadline for RSVP’s had arrived it was clear that this event had the makings of a great program tradition.” In addition to all the activities and sights that the Museum offers, the more than seventy attendants were entertained by a special visit from Santa Claus and one of his elves. The event was a wonderful time filled with lunch, balloons, ice cream, cake and gifts for the children. Parent and child reviews alike were stellar. The Residents and Fellows and their families greatly enjoyed this party and it will become an annual holiday event at the MGH.

Finally on a personal note my wife, Kimberly, and I have been gradually dealing with the challenges of turning a new home, new community, and new school district into a positive and productive family experience. The move to Boston has



ABC Traveling Fellows

given us an opportunity to evaluate carefully the needs and challenges for each of our family members. My sons, Bradley (age 14) and Stephen (age 12) had a generally positive year at the Weston Middle School and have been active in school academic as well athletic activities. In addition, Kristen (age 10) has enjoyed the Field School in Weston and horseback riding. Kimberly and I have been trying our best to support our family and develop a new set of friends and interests in the Boston area. Finally, I look forward to seeing many of you at our Annual Alumni Event at the American Academy of Orthopaedic Surgeons (AAOS) and please join us this year for the Annual Harvard Orthopaedic Golf Outing.



Piper Hayden with Santa



Drs. Mark Vrahas, Harry Rubash and Fran Hornicek with Santa

## 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

**Stephen B. Trippel, MD;** Associate 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

#### 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

**William H. Harris, MD;** Chief, Adult Reconstruction Service; 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

**Harry E. Rubash, MD;** Chief, MGH Department of Orthopaedic Surgery; 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

#### Spine

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

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

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

**David W. Lhowe, MD;** Chief, MGH Orthopaedic Trauma Service; Instructor in Orthopaedic Surgery, Harvard Medical School

#### 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

**David J. Zaleske, MD;** Chief, Pediatric Orthopaedic Service; Associate Professor of Orthopaedic Surgery, Harvard Medical School

### Fellows

#### Trauma

**Srino Bharam, MD**

#### Sports

**Christopher Breen, MD**

**David Smink, MD**

**Christopher Carey, MD**

#### Hand

**Marshall Brustein, MD**

**Michael Brunelli, MD**

#### Oncology Clinical

**Edward Fox, MD**

**Brian Brigman, MD**

#### Oncology Clinical & Research

**Mohammad Anwar Hau, MBBS, MMED**

**Yasser R. Farid, MD.**

**Jeung Il Kim, M.D.**

#### Arthroplasty

**David Vittetoe, MD**

**Gregory J. Golladay, MD**

**Brian R. Hallstrom, MD**

#### Shoulder

**John Macy, 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;** Instructor in Orthopaedic Surgery, Harvard Medical School

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

#### Retired

**Edwin T. Wyman, MD;** Assistant Clinical Professor of Orthopaedic Surgery, Harvard Medical School