Residency Program Director's Corner

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Program Director, Harvard Combined Orthopaedic Residency Program

Changes continue in the Harvard Combined Orthopaedic Residency Program. This sixth issue of the Orthopaedic Journal at Harvard Medical School will bring you up to date on these changes and improvements. Congratulations to Brandon Earp, MD and Conrad Wang, MD, this year's editors, and the rest of the resident editorial staff. Conrad, if you can imagine, has accomplished his editor's duties while on leave from the residency as a full time graduate student in the Harvard MBA Program and Brandon delivered her first child, Elliott Elizabeth, on October 12, 2003! I also want to thank our industry colleagues for their continued commitment to our Journal through advertising contributions.

There has been a great deal of discussion recently about the essentials of any residency program, including the PGY1 year. I thought you might like to read some history – a lecture given by Joseph S. Barr, MD, Chief of Orthopaedic Surgery at the Massachusetts General Hospital from 1946 through 1964. The lecture was given at a conference on residency training in orthopaedic surgery sponsored by the American Board of Orthopaedic Surgery and the American Academy of Orthopaedic Surgeons on January 23, 1959. As Joe Barr, Jr., stated: "Add a few words such as molecular biology, gene therapy, BMP, DEXA, CT, MRI, PET, etc. and it would be right up to date, I think." I would add a few more words such as: interpersonal and communication skills, practice based learning and improvement, systems-based practice, professionalism, ethics and free tissue transfer and the lecture would be current. The lecture was given to me by Joe Barr, Jr. and Art Boland. Art remembers receiving it when he applied to our residency program.

RESIDENCY TRAINING IN ORTHOPAEDIC SURGERY

The question which I am expected to discuss has been phrased as follows: "Should twelve months of general surgery training on an approved residency program be a prerequisite for training in orthopaedic surgery?"

This has led me to examine with some care the proper content of pre-orthopaedic specialty training and I have made a list of some of the subjects which I consider important. Let us assume that each person in this audience is a successful and happy orthopaedic surgeon and that each one of us has a son in his fourth year in medical school. The son, fortunately, is a little taller, considerably more handsome and is in all respects more intelligent and better trained than his father was. With admirable filial respect, he indicates that his clinical work in the third and fourth years in medical school has been very interesting and that he is attracted toward surgery in general and that he has some vague idea that possibly he may follow in his father's footsteps and become an orthopaedic surgeon. He asks for your advice as to whether he should have a medical or surgical or rotating internship and whether he needs any additional surgical training after that before he starts his training in orthopaedics. Let us list his needs by subjects rather than by departments. In some of these subjects the young man will have had a good deal of theoretical teaching, but in essentially none of them will he have had much in the way of practical experience. The list might include (1) fluid and electrolyte balance in health, injury and disease; (2) the use of blood and blood substitutes; (3) protein and vitamin metabolism. Patients suffering from burns, from traumatic shock and from diseases of the gastrointestinal tract should be seen in considerable numbers and the biochemical, physiological and bacteriologic problems connected with their care should be mastered. In the operating room the young MD is drilled in the ABC's of surgery, in asepsis and in antisepsis, in preoperative preparation, positioning on the operating table, draping the wound, the handling of tissues, the proper selection and use of surgical materials and in the fundamental surgical techniques of exposure, handling and repair of all the body tissues so that a broadly based, fundamental store of knowledge on wounds and wound healing becomes an intimate part of the young surgeon's armamentarium. He should have experience in repairing wounds of all types involving all types of tissue, skin, subcutaneous tissue; arteries and veins, nerves, muscle, ligaments, tendons and bone, and also should have had experience with handling of injury to the major organs.

The young surgeon should have experience in qualitative and quantitative evaluation of cardiorespiratory function and an intimate knowledge of the physiology of respiration, of oxygen and carbon dioxide exchange, the techniques of artificial respiration, the selection and proper administration of general and local anesthesia.

In order to gain experience in these fields and in others perhaps equally important, our young orthopaedic surgeon-to-be should spend enough time in a busy emergency ward so that he will have had actual experience in the diagnosis and treatment of a great variety of medical and surgical conditions on an immediate and practical level. He will learn how to take care of a child with a wringer hand and a belligerent, roaring drunk who has an open fracture of both bones of the leg. Here he gets a general practice experience crammed into a relatively

short period of time. He learns to examine patients quickly, carefully, to make correct decisions under pressure and to carry out treatment with skill and speed. His first sessions in the operating room should probably be under the direction of the anesthesiologists who teach him how to evaluate cardiorespiratory function, to assess operative risk, to select the proper anesthetic, to write preoperative (pre-medication) orders correctly and he will learn at first hand how to administer anesthetics and to carry patients through operations of increasing magnitude. He will learn how to establish airways, how to use bronchial suction and how to institute artificial respiration and to utilize positive pressure breathing techniques and to perform tracheotomy.

A tour of all of the surgical wards and of selected non-surgical and laboratory specialties will be an essential part of the training. On the general surgical and plastic wards he will learn the techniques of pre- and post-operative care, of maintaining good fluid balance and blood replacement, how to cope with the problems of ileus, of postoperative sepsis and of injuries to any of the major abdominal and thoracic organs. He will be thoroughly grounded in the management of circu-

Harvard Combined Orthopaedic Residency Program
Core Curriculum 2003 – 2004 Academic Year

SUBSPECIALTY BLOCK	FACULTY	RESIDENT
Sports	Peter Gerbino	Pat McCulloch
Trauma	Malcolm Smith	Ben Bengs
Pediatrics	John Emans	Travis Matheney
Business	Dan Estok	John Abraham
Spine (including trauma)	Mitchel Harris	Renn Crichlow Erik Spayde
Tumor	John Ready	Joe Czarnecki
Hand and Elbow	Jesse Jupiter	Brandon Earp Chris Forthman
Adult Reconstruction (including shoulder)	Andrew Freiberg Richard Scott	Hutch Huddleston
	Arun Shanbhag	David Cashen
Rehabilitation / Amputation	Robert Leffert	Neil Harness
Pain Management	Milan Stojanovic	Neil Harness
Mediolegal/Ethics	Tammy Martin Philip Blazar	Samantha Spencer
Foot and Ankle	Chris Chiodo James Heckman Michael Wilson	Nick Avallone
Biostatistics	Dan Estok	John Abraham
Basic Science assistance	David Krebs	

2004 Grand Rounds Speakers and Topics

9/3/03	Mitchel Harris, MD	Brigham & Women's Hospital	The Non-Operative Management of Thoracolumbar Fractures
9/10/03	Kathleen Dwyer	Harvard Risk Management Foundation	Reducing Malpractice with Effective Patient Communication (Risk Management)
9/24/03	Amy Ladd, MD	Stanford University Medical Center	Evolution of the Hand
10/1/03	Pierce Scranton, MD	Orthopaedics International	Management of Articular Defects in the Talus and Tibia
10/8/03	Hans-Christoph Pape, MD	Unfallchirurgische Klinik	New Trends in the Management of Major Fractures in Poly Trauma - Damage Control Orthopaedics
10/15/03	James Weinstein, D.O., M.S.	Dartmouth Hitchcock Medical Center	Healthcare in the New Millennium
10/22/03	Richard A Brand, MD	The University of Iowa	Writing for Keeps
10/29/03	Raymond Samuel, M.D, Ph.D	The Children's Hospital	The Effects of Hypoxia on Bone Formation
11/5/03	James G Wright, MD, MPH, FRCSC	Hospital for Sick Children	Evidence-Based Medicine; Flash Gordon or Flash in the Pan
11/12/03	Martin Bircher, FRCS	St. Georges Hospital	Improving Outcome in Acetabular Fractures
11/19/03	Bert Mandelbaum, MD	Santa Monica, California	ACL Mechanism of Injury and Prevention
11/26/03	Mark Myerson, MD	Mercy Medical Center	The Changing Spectrum of Treatments for Ankle Arthritis
12/3/03	Julianne Glowacki, PhD	Brigham & Women's Hospital	Osteoporosis in Osteoarthritic Postmenopausal Women
12/3/03	Myron Spector, PhD	Brigham & Women's Hospital	The Role of Joint Fluid in the Tribology of Total Joint Arthroplasty
12/10/03	C. Wayne McIlwraith, MD, PhD	Colorado State University	Studies in Articular cartilage repair and osteoarthritis in knees with relevance to humans
12/17/03	Kirkham Wood, MD	Stillwater, MN	Advances in Scoliosis
1/7/04	Michael Miranda, MD	Farmington, CT	Evolution of plate fixation
1/14/04	Mary I. O'Connor, MD	Mayo Clinic	Pelvic Limb Salvage: New Challenges
1/21/04	Dempsey Springfield, MD	Mt Sinai School of Medicine	Osteofibrous dysplasia, Fibrous dysplasia, and Adamantonoma
1/28/04	Shawn O'Driscoll, Ph.D, M.D.	Mayo Clinic	Principle-Based fixation of Distal Humerus Fractures
2/4/04	Frederick A Matsen, III, MD	University of Washington Medical Center	Shoulder Surgery: Principles and Procedures
2/11/04	Letha Griffin, MD	Peachtree Orthopaedic Clinic	Prevention of ACL Injuries in Young Athletes
2/18/04	Jesse Jupiter, MD	Massachusetts General Hospital	Reconstruction of posttraumatic forearm disorders
2/25/04	Gerard Karsenty, M.D., Ph.D.	Baylor College of Medicine	Regulation of Osteoblast Differentiation
3/3/04	James F Kellam, MD	Carolinas Medical Center	Minimal Invasive Fracture Fixation: Is it worthwhile?
3/17/04	Gilles Walch, MD	Clinique Sainte Anne Lumiere	Non-constrained vs constrained shoulder arthroplasty: why change the rules?
3/24/04	William H Harris, MD	Massachusetts General Hospital	E-Beam Highly Crosslinked Polyethylene and the Choice of Alternate Bearing Surfaces
3/31/04	Russell Warren, MD	Hospital for Special Surgery	Rotator Cuff Repair - Evolution of arthroscopic repair.
4/7/04	Robert Sah, MD	University of California-San Diego	Biomechanics of Cartilage Growth & Repair
4/14/04	William Healy, MD	Lahey Clinic	Thoughts on Femoral Neck Fractures
4/21/04	Savio Woo, PhD	Musculoskeletal Research Center	ACL Reconstruction: What are Recent laboratory Studies Trying to Tell Us?
4/28/04	D. Kevin Scheid, MD	Indianapolis, IN	History of Safety and Orthopedic Injuries in Open Wheel Indy Car Racing
5/5/04	James A Nunley II, MD	Duke University Medical Center	Achilles Tendon Disorders: Non-insertional and Insertional Disease
5/12/04	Peter G Trafton, MD	Medical Office Center	Tibia Fractures - To Nail or Not to Nail
5/19/04	Diego Fernandez, MD	Lindenhof Hospital, Berne, Switzerland	The role of intertrochanteric osteotomies for acute and chronic post-traumatic hip conditions
5/26/04	Orhun Muratoglu, PhD	Massachusetts General Hospital	Limitations of Contemporary Highly Crosslinked Polyethylenes and Two potential Second Generation Solutions.
5/26/04	Teresa Morales, Ph.D.	Massachusetts General Hospital	Chondrocyte Locomotion
5/26/04	Guoan Li, Ph.D.	Massachusetts General Hospital	Recent Progress in In-Vivo Musculoskeletal Joint Research.
6/2/04	Tom Minas, MD	Brigham & Women's Hospital	The Role of ACI in the Surgical Management of Patellofemoral Disease.. new trends and the future
6/9/04	Randy Loder, MD	Riley Children's Hospital	Lawnmower Injuries in Children
6/16/04	Kevin Raskin, MD	Massachusetts General Hospital	Limb Salvage in Oncologic Orthopaedics
6/23/04	ABC/JOA Travelling Fellows		Presentations from: American British Canadian Exchange Fellows (ABC Fellows) and Japanese Orthopaedic Association (JOA) Fellow

latory problems. He will be able to do a repair of any of the major vessels and will learn correct techniques in the management of thrombophlebitis, phlebothrombosis and pulmonary embolus. Although he hopes that he will never have to put his knowledge into practice in orthopaedics, he will know how to handle the patient with cardiac arrest, he will learn how to treat the patient with severe, extensive burn and will be familiar with the techniques of skin replacement, by split-thickness grafts, local plastic repair and by pedicle graft.

A stay on the neurological floor with experience, we hope, in both neuromedical and neurosurgical patients will make him familiar with the clinical techniques of a complete neurological evaluation and with the techniques and interpretation of special tests such as myelography, air and electroencephalograms, electromyelograms, etc. He will be able to evaluate and properly treat the unconscious patient and will know how to care for neurological injury whether intracranial, cord, plexus or nerve. He will know the technique for doing a meticulous end-to-end nerve suture. He will become familiar with the physiology of the autonomic nervous system and with disturbances involving the sympathetic and parasympathetic systems.

I believe that all of us would agree that the best orthopaedists have a good deal of insight into the psychologic and psychiatric aspects of their patients' problems and a considerable amount of training in this area is very much worth while. Here is one of the problems that needs more careful exploration. The techniques of correct evaluation in these areas should be learned during the training period. Medical schools are placing more emphasis on the teaching of psychiatry and I believe that the well-trained surgeon will probably spend some of his time in this area in his graduate studies.

Although many orthopaedic surgeons seem to feel that the x-ray department's only contribution is to furnish him with films of good quality, I believe that the radiologist has much to offer in the training of the orthopaedic surgeon. Such techniques as positioning of the patient, selection of proper exposure factors, the processing of films and careful inculcation of the resident in radiologic hazard and protection can best be done by the radiology department. The good radiologist will show the resident how to examine films and how to write a precise report of radiologic examination, describing only what he sees on the x-ray and not what he has discovered from clinical examination.

…In summary, I may say that in my opinion, in which I believe most able teachers concur, the general education of the young orthopaedic surgeon is neither adequate nor complete at graduation from medical school. As Dr. Churchill has expressed it, he needs to acquire a general education in surgery. I quote from his wise editorial in Annals of Surgery, September 1956:

"A general education in surgery should hammer into their heads the rich mine of information provided by a carefully taken and comprehensive history, the virtues of a complete physical examination, and the mastery over an unexpected complication made possible by the laboratory tests that rightly precede an operation of any sort. A general education in surgery will persuade them to keep their knowledge of human anatomy fresh and thus be able to extend with safety the regional operative field when needed; it will encourage them to develop certainty in the recognition of the morbid anatomy of disease. Future specialists need to learn about anesthetic agents and sedatives, blood loss and hemostasis, the origins of incisional infection, the processes of regeneration and cicatrisation, and common disturbances of water, chemical and nutritional balance. They must be made aware of the history of their calling so that they gain a feeling for the romance of surgery and also for its tragedy. They need to trace the way of the path along which the craft has emerged from the darkness and superstition of the past into the light of more rational procedure. Only by this backward glance will they be convinced that there can be no retreat.

Graduating resident plans

Name	Fellowship Specialty	Location	Fellowship Director
Renn J. Crichlow, MD	Trauma	Maryland Shock Trauma, Baltimore, MD	Cliff Turen, MD
Joseph J. Czarnecki, MD	Sports Medicine	Massachusetts General Hospital, Boston, MA	Bertram Zarins, MD
Brandon E. Earp, MD	Hand	Brigham and Women's Hospital, Boston MA	Barry Simmons, MD
Neil G. Harness, MD	Hand	UCLA, Los Angeles, CA	Neil Ford Jones, MD
James I. Huddleston, MD	Adult Reconstruction	Massachusetts General Hospital, Boston, MA	Andrew Freiberg, MD
L. Pearce McCarty, MD	Sports Medicine	Rush Presbyterian-St. Lukes Hospital, Chicago, IL	Bernard Bach, MD
Robert V. O'Toole, MD	Trauma	Maryland Shock Trauma, Baltimore, MD	Cliff Turen, MD
Robert C. Parisien, MD	Sports Medicine	Brigham and Women's Hospital, Boston MA	Scott Martin, MD
Sean O. Rassman, MD	Sports Medicine	Lenox Hill Hospital, New York, NY	Barton Nissonson, MD
Jason D. Tavakolian, MD	Hand	Curtis National Hand Center, Baltimore, MD	Thomas Graham, MD
Lauren Adey, MD	Hand	Massachusetts General Hospital, Boston, MA	Jesse Jupiter, MD
Eric Giza, MD	Sports Medicine	St. John's Hospital, Santa Monica, CA	Bert Mandelbaum, MD
James O'Holleran, MD	Sports Medicine	Hospital for Special Surgery, New York, NY	Thomas Wickiewicz, MD
Karl Schultz, MD	Adult Reconstruction	Rush University Medical Center, Chicago, IL	Aaron Rosenberg, MD
Conrad Wang, MD	Masters in Business Administration	Harvard Business School, Boston, MA	

They will grow in stature by an acquaintance with the names and lives of the leaders who have shown the way and forged the tools that are dedicated not to the self-aggrandizement of those who wield them, but to the well being of mankind. Above all, specialists must be brought to see that surgery is but an activity of medicine, and that when its action is directed in a wise and humane fashion, how greatly the happiness of man can be served, but that if directed unwisely or thoughtlessly, how quickly a human life can be wrecked.

"No one in his right mind would wish to relinquish the benefits of the expert technical skills that are the products of concentrated specialist training, but only a general education in surgery can safeguard and direct the use of these skills. It thus becomes an essential part of all specialist education."

Where can such a general surgical education be procured? To a large extent on the general surgical services of the better teaching hospitals.

But the best services are not so good that they cannot be better. I would suggest as a practical measure that our Board or a special committee of orthopaedic leaders sit down with their counterparts in so-called general surgery and work out the curricular details of what constitutes a general education in surgery and that we bring this blueprint plan to the attention of the chiefs of surgical services and ask for their leadership in effectively creating graduate resources for general education in surgery which would be pre-requisite to specialty training. The College of Surgeons might well take the leadership in developing the programs and in administering the examinations that would certify that the successful candidates are in fact ready for specialty training. In my opinion, this would be a forward step which would strengthen the College of Surgeons, would improve the quality of our applicants for orthopaedic training and would improve the standards of care of our orthopaedic patients.

Joseph S. Barr, MD

An important event for our residency program was our recent (April 7, 2004) accreditation review site visit. In 1999 we received full accreditation for five years (the maximum possible) without citations. Our program has undergone many changes since that review in 1999: We have eliminated the extra six months rotation in research and the six months chief residency obligation. Our program remains five years. We have control over the PGY1 rotations. We have instituted the 80-hour workweek by changing rotations to include a night float system for the PGY2 residents at the MGH and BWH and the PGY3 residents at Children's Hospital. Essentially the residents on these night float rotations work a night shift (6 pm to 6 am) six days each week. They have no day obligations. Interestingly although some of us (including me) had concerns about this rotation, the residents like it – they get more rest/sleep because their night call schedule for the remainder of the year is reduced, they are able to read and study more and they believe the patients receive better care. The care is improved because during this five-week rotation the residents get to know the patients as well as the patient's attending physician and his/her accompanying residents who care for the patients during the day. Turnovers of care are therefore decreased among different residents. The residents created a PDA electronic turnover list, which further improves patient safety. The 80-hour workweek target has also been aided because of an increase in physician assistants and clinical nurse practitioners at each hospital.

I want to thank all the residents and faculty and especially the hospital chiefs for participating in this important site visit. In addition to accreditation for another five years, we are requesting an increase in residents to 12 each year (total 60). This will return us to our traditional number of residents each year which we reduced to ten in the early 1990's. We are also requesting a three month research rotation for each resident during their PGY4 year and a return of residents to the BIDMC. As you have probably heard, Dr. Mark Gebhardt has assumed the leadership at the BIDMC as chief of the Orthopaedic Department. Please congratulate Mark when you see him. He is actively recruiting new full-time academic faculty. One of the major strengths of the BIDMC is their geriatrics program. The executive committee has agreed to add this important area of orthopaedic education for our residents if we receive approval to increase the number of residents. The BIDMC has an inpatient geriatric unit: We plan to have residents gain further experience in the care of the elderly in adult reconstruction, management of fragility fractures, management of major chronic diseases such as metastatic disease and diabetes – all in collaboration with geriatric specialists.

In preparation for this site visit we had to demonstrate that our program has included the new six core competencies in our goals and objectives, and begun to develop methods to measure residents' achievements regarding these competencies. To accomplish these tasks the specialty service chiefs each developed a new and updated document of goals and objectives for the residents (and fellows in some cases) on their service. This has been a worthwhile and time-consuming project. I thank each service chief and the participating residents for their efforts. Also a special thanks to Karla Pollick for making it happen and for the extraordinary efforts to complete all documents for the RRC site visit. And a special thanks to Diane Sheehan – without her labors we would not have the reams of data needed, the new electronic evaluation system as well as the additional new RRC requirements demanded of every residency program.

To give you a feel for some of these changes I will mention a few examples: 360-degree evaluations of all residents – anyone who comes in contact with the resident will complete an evaluation form. In addition to faculty, evaluations are being requested from nurses and patients and, soon, from each resident. This effort will be expanded to other physicians, scientists, operating room staff, therapists and secretaries in the future. Every resident must maintain a surgical and non-operative procedure log that is reviewed by the RRC and myself. Data will be shared with the Executive Committee to insure every resi-

dent obtains the surgical experiences needed before graduating. More oral and written examinations are planned from specialty services. A short essay is required of the resident before my semi-annual review. These essays deal with ethics, professional judgment and other critical issues and are discussed during the residents' semi-annual evaluation with the Program Director.

Two additional initiatives have been started this year. I have begun a series of seminars with the residents on Saturday mornings entitled "The Business of Orthopaedics". We discuss the nuts and bolts of going into practice – contracts, billing, allocation of expenses, malpractice, bonus systems, new government regulations, CPT coding, marketing and other topics. Also this year, Dinesh Patel has been approved as one of four orthopaedic surgeons to participate in an evaluation of a virtual reality arthroscopic knee simulator sponsored by the American Academy of Orthopaedic Surgeons. The study will evaluate our residents' performance in using the simulator and in completing a diagnostic arthroscopy on a patient.

This past year has brought many changes in my life. Having turned 65 years of age last October, I have retired as Chairman of the Partners Department of Orthopaedic Surgery and stopped operating. I remain as Director of the Harvard Combined Orthopaedic Residency Program and continue to see patients at the MGH and BWH. The highlight of my career – serving as President of the American Academy of Orthopaedic Surgeons this year - has been truly exciting and challenging. I am especially pleased at the tremendous success of our Academy's Patient Safety Program, which remains active, as well as the Association's leadership in medical liability reform and patient education. The Academy's "research agenda," education programs (especially our great annual meeting in San Francisco) and OKO as well as numerous other activities supporting our members' needs are outstanding. As past president now I continue to write and speak about patient safety issues and the importance of having physicians lead this initiative for our patients' protection. I believe that, if our patients believe we are doing all we can to reduce medical errors, they will be our partners in efforts to change the dysfunctional health care system in which we all work, as well as efforts to affect medical liability reform.

Congratulations and best wishes to our graduating residents as they leave for fellowship training and practices. On behalf of the Harvard Combined Orthopaedic Residency Program and the institutions we represent, I want each of you to know that we are proud of you and thank you for your contributions in insuring the continued excellence of Harvard Orthopaedics.

71st Annual Meeting of the AAOS
San Francisco, CA March 2004

Paper # 22 Articular Cartilage Defects in Children & Adolescents: Treatment with Autologous Chondrocyte Implantation	*LJ Micheli, JB Moseley, AF Anderson, JE Browne, C Erggelet, R Arciero, FH Fu, B Mandelbaum*
Paper #25 Prevalence of Meniscal and Chondral Injuries with ACL Tears in Skeletally Immature Patients.	*MS Kocher*
Paper # 143 Glenoid Bone Grafting with Uncemented Glenoid Fixation in Total Shoulder Arthroplasty	*SD Martin, D Zurakowski, TS Thornhill*
Paper# 145 Revision Total Shoulder Arthroplasty	*SD Martin, D Zurakowski, TS Thornhill*
Poster #19 A new technique for 3-D measurement of polyethylene wear in total hip arthroplasty using plain radiography	*Bragdon CR*
Poster #42 In-vitro comparison of conventional versus highly crosslinked UHMWPE against 36 and 40-mm femoral heads	*BR Burroughs, OK Muratoglu, WH Harris*
Poster #45 In vivo wear of traditional versus highly crosslinked polyethylene	*D Manning, P Chiang, J Martell, JO Galante, WH Harris*
Poster #75 In vitro wear of explanted acetabular liners. Highly crosslinked versus conventional polyethylene.	*OK Muratoglu, KK Wannomae, A Doherty, CR Bragdon, SD Christensen, BR Burroughs, AA Freiberg, HE Rubash, WH Harris*
Poster #096 Simulated normal gait wear testing of a highly crosslinked polyethylene tibial insert	*OK Muratoglu, HE Rubash, CR Bragdon, BR Burroughs, A Huang, G Plank, WH Harris*
Poster # P108 Use of Less Invasive Stabization System (LISS) for Periprosthetic Femur Fractures After TKA	*O'Toole RV, Gobezie RG, Chandler A, R Hwang, Freiberg A, TS Thornhill, M Smith, M Vrahas*

Poster # P152
The Influence of the ACL on Articular Contact of a Fixed Bearing UKA – An In-vitro Investigation — *JF Suggs, G Li, SE Park, PG Sultan, S Steffensmeier, AA Freiberg, HE Rubash*

Poster # P199
Locking compression plates for delayed unions and nonunions of the diaphyseal humerus. — *D Ring, J Kadzielski, Kloen P, Helfet D, JB Jupiter*

Poster # P222
Tibial Pilon Fractures Treated via Posterolateral Approach — *RJ Crichlow, M Vrahas, R Gobezie, Ponce*

Poster #P223
Nonunion of the tibia with posterolateral approach and ORIF — *RJ Crichlow, M Vrahas, R Gobezie, Ponce*

Poster # P253
Coronoid Fracture patterns. — *J Doornberg, D Ring*

Poster # P254
Hinged External Fixation After Fracture-dislocation — *D Ring, D Hannouche, JB Jupiter*

Poster #P255
Post-op loss of alignment posterior monteggia fractures: salvage with dorsal contoured plating. — *D Ring, Tavakolian J, Kloen P, Helfet D, JB Jupiter*

Poster # P276
Treatment of acute traumatic elbow instability without medial collateral ligament repair — *C Forthman, D Ring*

Poster # P277
Fracture-dislocations of the elbow: can injury components be predicted based upon injury patterns? — *C Forthman MD, D Ring*

Poster #P360
In-Hospital Outcome and Resource Use in Hip Arthroplasty: Influence of Body-Mass Index — *SR Jibodh, JF Wenz Sr, IN Gurkan*

Poster #P449
Diaphyseal nonunion of the forearm. — *D Ring, C Allende, K Jafarnia, B Allende, JB Jupiter*

Poster #P450
Pitfalls in the Treatment of Volar Shearing (Barton's) Fractures of the Distal Radius. — *N Harness, D Ring, JB Jupiter*

Poster #P451
Computed Tomography of Suspected Scaphoid Fractures — *D Ring, L Adey, S Levitz, JB Jupiter*

50th Annual Meeting of the ORS

San Francisco, CA March 2004

Podium Presentations:

Paper # 41
Mechanics of Tissue Engineered Cartilage Integration To Bone — *MA Randolph, MT Villa, GM Peretti, LJ Bonassar, MJ Yaremchuk*

Paper #62
Skeletal metastasis adversely affects bone tissue properties — *A Nazarian, Rho J, M Grynpas, D Zurakowski, R Mueller, B Snyder*

Paper #72
Comparison of TGF/BMP superfamily pathways signaled by BMP-2 and demineralized bone powder in human dermal fibroblasts. — *J Glowacki, S Zhou, KE Yates*

Paper# 66
Absence of transcription factor NFATp enhances endochondral ossification during healing of long bone defects — *J Wang, L Xu, L Wunderlich, L Glimcher, M Glimcher*

Paper #113
Sequential injection of rhBMP-2 enhances consolidation of bone regenerate in a sheep model of distraction osteogenesis — *H Windhagen, F Witte, U Halbritter, C Hurschler, H Seeherman, M Bouxsein*

Paper # 82, 3:15pm, Room 3001-03
Tibiofemoral Joint Kinematics Affect Patellofemoral Joint Contact Pressures — *LE DeFrate, TJ Gill, SE Park, BD Stamos, G Li*

Paper #136
rhBMP-2 influences the mechanism of bone consolidation in distraction osteogenesis by optimizing the regenerate microarchitecture — *M Wellmann, F Witte, J Nellesen, H Crostack, T Floerkemeier, H Seeherman, M Bouxsein, H Windhagen*

Paper #181
A five year clinical comparison of the measurement of femoral head penetration in THR using RSA and the Martell method. — *CR Bragdon, ME Greene, J Thanner, H Malchau, J Karrholm, J Martell, WH Harris*

Paper #184 Mechanical elimination of free radicals in UHMWPE after radiation	Bhattacharyya S, Speigelberg SH, Harris WH, Muratoglu OK
Paper #213 Alpha-tocopherol-rich crosslinked UHMWPE has high fatigue resistance and low wear rate	Oral E, Hawkins NE, O'Keefe MC, Wannomae KK, Harris WH, Muratoglu OK
Paper #216 Articular and backside wear in tibial inserts in a cruciate-retaining total knee arthroplasty? An in vitro study.	Muratoglu, OK, Perinchief RS, Burroughs BR, Christensen SD, Plank GR, Rubash HE, Harris WH
Paper # 241 Anterior Tibial Post Impingement In A Posterior Stabilized Total Knee Arthroplasty	G Li, R Papannagari, E Most, SE Park, T Johnson, L Tanamal, HE Rubash
Paper #257 The effect of trabecular metal porous surface on gap healing and bone ingrowth in a canine total hip model	CR Bragdon, AM Doherty, P Chiang, HE Rubash, M Jasty, WH Harris
Paper #276 Severe in vivo oxidation in a limited series of retrieved highly-crosslinked UHMWPE acetabular components with residual free radicals	Bhattacharyya S, Doherty AM, Wannomae KK, Oral E, Freiberg AA, Harris WH, Muratoglu OK
Paper #297 In vitro simulator wear of highly crosslinked tibias articulating against explanted rough femoral components	OK Muratoglu, BR Burroughs, SD Christensen, A Lozynsky, WH Harris
Paper #300 In-vitro Kinematics of Posterior Cruciate-Retaining Total Knee Arthroplasty at High Flexion	E Most, G Li, P Sultan, SE Park, HE Rubash
Paper #308 Behavior of Adult Canine Annulus Fibrosus Cells Seeded in Type II Collagen-Gag Scaffolds and Cultured in Medium Supplemented with TGF-B1 OR FGF-2	L Saad, M Spector

Poster Presentations

Poster #412 Increased bone mass and strength in melanocortin-4 receptor-deficient mice	Orwoll B, Bouxsein ML, Marks DL, Cone RD, Klein RF
Poster #504 Local morphometry predicts weakest link in human cancellous bone	Nazarian A, Stauber M, Mueller R
Poster # 659 Reduction Of Periosteal Osteogenesis In Chronic Hypoxia	RE Samuel, JG Hofstaetter, Y-H Choi, MJ Glimcher
Poster #540 Heterogeneity of mass transfer in bovine articular cartilage	S Mizuno, M Watanabe
Poster #707 IGF-1 Gene-Supplemented Collagen Scaffolds Enhance IGF-1 Synthesis by Chondrocytes	RM Capito, G Palmer, S Ghivizzani, M Spector
Poster #716 Wnt signaling during post-natal chondroinduction of fibroblasts by demineralized bone	KE Yates
Poster #717 Effects of IGF-1 And FGF-2 on Articular Chondrocytes in Type II Collagen Matrices	NH Veilleux, M Spector
Poster # 722 Morphology Of Chondrocytes On Electrospun Nanofibrous Scaffolds	Shortkroff, S; Garcia, J; Yu, JH; Thornhill, TS; Rutledge, GC
Poster #726 Hydrostatic pressure suppresses long term degradation of matrix accumulated by porcine articular chondrocytes in 3D collagen gel/sponge	A Kusanagi, J Johnson, EB Blahut, AC Mascarenhas, S Mizuno
Poster #737 Chondrogenesis of C3H10T1/2 mesenchymal stem cells encapsulated in a self-assembling peptide hydrogel and exprosed to growth factor combinations delivered via adenoviral gene transfer.	JD Kisiday, GD Palmer, Ghivizzani SC, Pilapil C, Steinert AF, Gouze E, Evans CH, Grodzinsky AJ, JN Gouze
Poster #740 In situ gene therapy to enhance anterior cruciate ligament repair using a collagen hydrogel	Pascher A, Steinert AF, Palmer GD, Evans CH, Ghivizzani SC, Gouze JN, Gouze E, Betz O, Pilapil C, MM Murray
Poster #775 Evaluation of adenoviral mediated TGF-ß1, BMP-2 and IGF-1 gene transfer to induce chondrogenesis of primary mesenchymal stem cells.	AF Steinert, Palmer GD, Pascher A, Gouze E, Gouze JN, Betz O, Pilapil C, Johnstone B, Evans CH, SC Ghivizzani

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Poster #832 Behavior of Adult Canine Annulus Fibrosus Cells in Collagen-Gag Scaffolds when Cultured in a Rotating Wall Bioreactor	L Saad, M Spector
Poster #984 Alterations In Gene Expression Levels Due To Cancer-Bone Cell Interactions Studied By Comprehensive Gene Array Analysis	P Curtin, L Wunderlich, R Fluckiger, E Salih
Poster #1010 Assessment of Osteoarthritis Progression In Vivo: Sequential, High-Resolution Imaging of Changes to Articular Cartilage and Subchondral Bone	SB Adams Jr, MJ Roberts, PR Herz, S Bourquin, NA Patel, SD Martin, DL Stamper, JG Fujimoto, ME Brezinski
Poster #1140 Release of Recombinant h BMP -2 from Absorbable Collagen During the Mechanical Compression Associated with its use for Spinal Fusion	M Spector, JM Zanella, SM Peckham, HS Sandhu
Poster # 1237 Cellular Repair of Meniscal Lesions in the Avascular Region	C Weinand, MA Randolph, GM Peretti, SB Adams, TJ Gill
Poster # 1247 The Effect Of Axis Choice On Knee Kinematics	E Most, J M Axe, HE Rubash, G Li
Poster # 1248 In-vivo Tibiofemoral Joint Kinematics During Weightbearing Flexion	LE DeFrate, H Sun, TH Wuerz, TJ Gill, G Li
Poster # 1252 The Effect of Incision of Posterior Capsule on Knee Function During PCL Reconstruction Using a Tibial Inlay Technique	SE Park, BD Stamos, LE DeFrate, TJ Gill, GLi
Poster # 1290 The Change In Length Of The ACL And PCL During In-Vivo Knee Flexion	GLi, LE DeFrate, H Sun, TJ Gill
Poster # 1385 Development of a knee phantom for the evaluation of methods for measuring knee joint kinematics	CR Bragdon, J Veldhoven, N Borlin, WH Harris
Poster # 1369 A new approach for a the Martell 3-D method of measuing polyethylene wear without requiring the cross-table lateral films	Bragdon CR, Martell J, Estok DM, Veldhoven J, Malchau H, Harris WH
Poster # 1397 Tibiofemoral Contact For Conventional And High-Flexion Posterior Cruciate-Retaining Total Knee Arthroplasty	E Most, G Li, S-E Park, P Sultan, R Papannagari, HE Rubash
Poster # 1437 Effect of surface and vertical ribs on cemented stem stability in stair climbing in vitro	A Jamali, A Lozynsky, WH Harris
Poster # 1450 Penicillin in lieu of sodium azide as an anti-bacterial agent in bovine serum: The effect of wear of UHMWPE obtained on a hip simulator.	Burroughs BR, Christensen SD, Lozynsky AJ, Muratoglu OK, Harris WH
Poster #1460 Friction of Oxidized Zirconium versus Cobalt-Chromium Alloy against Polyethylene	Mazzucco, D; Spector, M
Poster #1471 Fatigue Behavior of Crosslinked UHMWPE with High Crystallinity	K Simis, L Pruitt, A Bistolfi*, A Bellare
Poster #1474 Mechanical elimination of free radicals in an irradiated UHMWPE rod: Advantages over melting	Bhattacharyya S, Matrisciano L, Speigelberg SH, Harris WH, Muratoglu OK
Poster # 1475 Oxygen concentration in synovial fluid and potential for in vivo oxidation of UHMWPE with residual free radicals	Muratoglu OK, Bhattacharyya S, Wannomae KK, Freiberg AA, Harris WH
Poster #1478 In vivo wear of traditional versus highly crosslinked polyethylene	D Manning, P Chiang, J Martell, WH Harris
Poster #1479 The relative effects of gamma radiation crosslinking and type of counterface on the wear resistance of ultra-high molecular weight polyethylene	A Bistolfi, Y-L Lee, A Bellare
Poster # 1480 Integrity of locking mechanism using aged highly crosslinked UHMWPE against conventional PE: Large femoral heads up to 22 million cycles in vitro.	Muratoglu OK, Burroughs BR, Bhattacharyya S, Christensen SD, Lozynsky AJ, Huang AF, Plank GR, Harris WH

Poster # 1485 Blending alpha-tocopherol with UHMWPE powder for oxidation resistance	E Oral, ES Greenbaum, WH Harris, OK Muratoglu
Poster # 1492 Does Alendronate Inhibit The Progression Of Periprosthetic Osteolysis?	HE Rubash, L Dorr, J Jacobs, W Maloney, K Saag, W Malbecq, A Leung
Poster #1524 Preheating of PMMA Polymer Powder and its Effect on Working Time	ME Turell, W Fitz
Poster #1526 Biocompatibility of a New Nanocomposite Cement	S Shortkroff, J Garcia, TS Thornhill
Poster #1527 The Effects of Radiopacifier Particle Concentration on Mechanical Properties of a Nanocomposite Bone Cement	AH Gomoll, A Bistolfi, A Bellare, RD Scott, TS Thornhill, W Fitz
Poster # 1528 Using radiopacifier nanoparticles to improve the work-of-fracture of bone cement	Y-L Lee, A Bellare, TS Thornhill

Harvard Combined Orthopaedic Residency Program
Incoming PGY-2 residents
for 2004-2005

Gregory J. DeBlasi, MD
Yale University
School of Medicine
Internship: MGH

Sanaz Hariri, MD
Stanford University
School of Medicine
Internship: MGH

Raymond W. Hwang, MD
Harvard Medical School
Internship: MGH

Catherine E. Johnson, MD
Cornell University Medical College
Internship: BWH

Steven Mattheos, MD
U. of Massachusetts School
of Medicine
Internship: BIDMC

Charles J. Petit, MD
UC San Diego School of Medicine
Internship: BIDMC

Catherine A. Petty, MD
Medical University of
South Carolina
Internship: BIDMC

Mark D. Price, MD
Harvard Medical School
Internship: BWH

Craig A. Rineer, MD
Duke Medical School
Internship: BWH

Nina Shervin, MD
Rush Medical College
Internship: MGH

Harvard Combined Orthopaedic Residency Program
Matched Orthopaedic Interns
Starting June 2004

Julius A. Bishop, MD
Harvard Medical School
Internship: BWH

Robert K. Fullick, MD
University of Texas Medical School at Houston
Internship: MGH

Michael P. Glotzbecker, MD
University of Pennsylvania School of Medicine
Internship: BIDMC

Kathryn S. Grannatt, MD
University of Utah School of Medicine
Internship: BIDMC

Jordan N. Greenbaum, MD
University of Pennsylvania School of Medicine
Internship: BIDMC

John Y. Kwon, MD
New York Medical College
Internship: MGH

James T. Monica, MD
Columbia University College of Physicians and Surgeons
Internship: BWH

Babajide A. Ogunseinde, MD
Howard University College of Medicine
Internship: MGH

George Pappas, MD
Stanford University School of Medicine
Internship: BWH

Coleen S. Sabatini, MD
Harvard Medical School
Internship: MGH