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# Our Vision

To be the nation's leader in Orthopaedic excellence. We will lead national research innovation, education and excellence in orthopaedic surgery that contributes to better mobility and quality of life for patients.



Faculty, graduate residents and fellows - June 2010

# Our Mission

To leverage one of the nation's richest orthopaedic research environments, multidisciplinary collaborations unique to UC Davis and our outstanding faculty to enable compassionate patient care, ground-breaking innovations and superior training for existing and future generations of orthopaedic surgeons.



## **U.S. News Best Hospitals 2010-11**

The UC Davis Medical Center ranks among the top 50 hospitals in America, according an annual survey that was published in the August print issue of U.S. News and World Report and online at http://health.usnews.com/ best-hospitals. Out of more than 5,000 hospitals nationwide, the UCD Med Center was ranked 35th for orthopaedics and 50th for cancer.

Only three other Northern California hospitals ranked in the top 50 for orthopaedics: UCSF Medical Center, Stanford Hospital and Clinics and John Muir Medical Center in Walnut Creek.

Dr. Paul Di Cesare, medical director and chair of orthopaedic surgery at UCD, said the recognition highlights efforts toward building a leading orthopaedic department. "The UC Davis department of orthopaedic surgery is a leader in state-of-the-art orthopaedic surgery, research and education," he said.

The department has a Level 1 Adult Trauma Center and a musculoskeletal research center that are among the nation's most sophisticated and interdisciplinary, Di Cesare added. "Our program, encompassing nine subspecialties, a 24-hour Level 1 Trauma Center and Shriner's Children's Hospital, plus access to the latest clinical research trials, ensures one-stop coverage and the best available care," he said.

Follow us on



# **Progress Report from the Chair**



Paul E. DiCesare, MD, FACS Michael W. Chapman Chair

When reflecting on this past fiscal year, July 2009 - June 2010, the summation is two words: mission viability. In a climate of economic uncertainty and healthcare reform, we were faced with new realities and called upon to capitalize on opportunities to reinvent ourselves as a department while staying true to our identity. Implementing new processes can be challenging. However, we have not only weathered, but exceeded expectation during the transitions of the past year, and have positioned ourselves to prosper as we continue to face future times of transition for years to come.

In order to have a viable clinical division, fiscal year 2010 focused on the clinical aspect of our mission. There was great effort involved in looking for opportunities to streamline processes, enhance revenues, educate physicians regarding documentation, reduce costs, and most importantly, provide a more favorable environment for our patients to receive care and for our staff, faculty and trainees to work and practice

orthopaedic medicine. In January 2010, April Hillard, our new practice manager, joined our team and has been charged with spearheading numerous initiatives. As a result of everyone's involvement in helping to improve the clinic experience, our patient satisfaction scores have notably improved! This is a great affirmation that our disciplined work and relentless energy is positively effecting our patients.

In an effort to ensure that members of the department were sharing a congruent message about the myriad of services we provide, and were aligned with our four key missions: clinical, community engagement, education and research, our faculty participated in a series of discussions and a vision planning workshop hosted by an outside facilitator. Our end product was a succinct vision, mission, and key messaging statement. We hope to utilize our newly defined words by continually engaging members of our community through dynamic conversations, communication mediums, and development activities.

September marked the implementation of a new educational offering: resident preparation for the orthopaedicin-training examination. Residents attended weekly sessions focusing on subspecialty content taught by faculty. In January 2010, we were pleased to learn that our residency program was approved to increase from four to five permanent slots per year, bringing the total of residents in our program to twenty five. This past fiscal year, the Doctors Research and Education Fund (DERF) was established. Funded by faculty donations, trainees have the opportunity to apply, with the support of a faculty investigator, for funds to promote their education or research endeavors.

A focus for our research mission was strengthening our relationship with the Bioengineering Department, in an effort to broaden our research collaboration within the UC Davis community and create a viable partnership that is aligned with the visions of both departments. In October 2009, Kyriacos Athanasiou, PhD, was jointly appointed to our department, while primarily serving as the Chair of Bioengineering. Dr. Athanasiou has worked closely with Dr. Fyhrie to focus on the recruitment of our Doris Linn Endowed Chair vacancy that we are looking to fill in the near future. Drs. Athanasiou and Fyhrie also serve as joint faculty mentors to our newest research faculty member, Dr. Blaine Christiansen, who joined our department in March 2010. I look forward to watching this partnership prosper in the years ahead.

Mission viability is crucial to the success of our department and is the pathway for us to achieve our vision of being the nation's leader in orthopaedic excellence. In the following pages, you will see highlights from fiscal year 2010. Hopefully you will appreciate as much as I do, the diversity of our faculty, staff, and trainee members and programs.

Regards,

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Paul Di Cesare, MD Professor and Chair

# A Message from the Lab Director

We continued to grow last year, increasing by four faculty and publishing actively. Joining us in the last year were Blaine Christiansen, PhD, as Assistant Professor in Residence; Jasper Yik, PhD, as Adjunct Assistant Professor; and Kyriacos Athanasiou, PhD, as Professor. Kyriakos Komvopolous, PhD, Professor, actually joined us early in fiscal year 2010-2011.

Dr. Christiansen was a postdoctoral fellow with Mary Bouxsein at the Beth Israel Hospital. He earned his PhD in bioengineering at Washington University with Matt Silva. His primary research interest is in the role of mechanical loading in regulation of bone structure and strength. He is an expert in mouse and rat experimentation, biomechanical testing, histological analysis, microcomputed tomography and most other technology used in biomechanics. He was accepted as a member of the Biomedical Engineering Graduate Group.



David P. Fyhie, PhD David Linn Endowed Chair

Dr. Yik originally came to UCD Orthopaedics as a visiting postdoctoral scholar from UC Berkeley. He works directly with Dr. Di Cesare to understand the cell biology of the molecule COMP (cartilage oligomeric matrix protein) and its expression in health and arthritis. The goal is to determine the basic physiology of this important molecule (it is part of the system that forms the collagen fibers of cartilage) and also to determine whether changes in COMP expression affect the formation or degradation of cartilage during arthritis.

Dr. Komvopoulos is an expert in tribology and joined the laboratory as a Professor at Berkeley. He joined the laboratory with a WOS appointment (without salary) and works closely with Dr. Reddi on tribology of articular cartilage.

Dr. Athanasiou joined as Professor with a 50% appointment in Orthopaedics and 50% in Biomedical Engineering. He is the Chair of the Biomedical Engineering Department, has great expertise in tissue engineering of cartilage and started five companies during his academic career, one of which sold for \$75 million. His efforts include developing new methods to regenerate articular cartilage and he works closely with Dr. Reddi.

#### Updating on the "oldtimers" in the laboratory:

Sunny Kim is working currently on a joint registry and teaching in biostatistics. She has applied for her tenure promotion this year.

Dr. Haudenschild continues to work with Drs. Di Cesare and Reddi on tissue regeneration projects, but his particular interest is the mechanobiology of cartilage. Dominik filed a provisional patent on the association of growth factors with COMP this year—a newly discovered function of the molecule. Derek Amanatuallah, last year's Dr. Denny and Mrs. Jeanene Dickenson Resident Fellow worked closely with Dr. Haudenshild on his mechanobiology projects and obtained very interesting preliminary data. The project is continuing with the assistance of a new PhD student, Jeff Lu.

Dr. Reddi was on sabbatical in Spain for part of the year and his student Stephanie Chan successfully defended her dissertation this fall.

Dr. Fyhrie's student Matt Anderson completed his master's in biomedical engineering this fall and joined the laboratory as a Junior Specialist working under the supervision of Blaine Christiansen.

Dr. Mark Lee's collaborations with Dr. J. Kent Leach of biomedical engineering were successful when they obtained two research grants totaling more than \$300,000 of funding.

A highlight of our research program is the Dr. Denny and Mrs. Jeanene Dickenson Resident Research Fellowship. Last year's fellow, Dr. Derek Amanatuallah, worked closely with Dr. Haudenschild to understand the mechanical regulation of cartilage macromolecules using a cell culture model developed here in the Ellison Center. Dr. Joel Williams is this year's fellow and is working closely with Dr. Mark Lee to improve fixation to heal refractory fractures.

At the time of this writing, our 2010 Research Symposium was a week ago. The Distinguished Guest Speaker was David Mooney, PhD, who is a Core Faculty Member of the Wyss Institute for Biologically Inspired Engineering at Harvard University. His laboratory is focused on the design and synthesis of microenvironments, or niches, that regulate the fate of either transplanted cell populations or cells already resident in tissues. Dr. Mooney's lecture (and the whole symposium) was well attended, drawing an audience more broadly than last year with attendance from across the campus.

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David P. Fyhrie, PhD Professor and Director Orthopaedic Research Lab

Last year's publications from the Ellison Laboratory are listed in the back of this report. The following is a list of our research sponsors:

AO North America AO Resident Research Grant Program Artimplant Biomet Orthopaedics, Incorporated Dr. Michael W. Chapman and Mrs. Elizabeth C. Chapman Depuy Acromed, Inc. Dr. Denny Dickenson and Mrs. Jeanene Dickenson Mr. Lawrence J. Ellison and Mrs. Melanie Craft Ellison Glaxo Smith Kline Koret Foundation David and Doris Linn Medtronic, Inc National Institutes of Health OMeGA Medical Grants Association Orthopaedic Research and Education Foundation Orthopaedic Trauma Association Paul R. Lipscomb Sr. Fund Procter & Gamble Pharmaceuticals Shriners Hospital for Children Smith & Nephew, PLC Stryker Howmedica Osteonics Synthes Corporation **Ben Trainer** UC Davis Biology Undergraduate Scholars Program UC Davis Faculty Research Grant Program UC Davis Health System Research Awards

Kyriacos A. Athanasiou, PhD Distinguished Professor of Biomedical Engineering and Orthopaedic Surgery, Chair of Department of Biomedical Engineering



Dominik R. Haudenschild, PhD Assistant Professor



Blaine A. Christiansen, PhD Assistant Professor



Sunny H. Kim, PhD Assistant Professor, Orthopaedics Clinical Outcomes Research

Kyriakos Komvopolous, PhD Visiting Professor, WOS, Dept of Orthopaedics and Professor of Mechanical Engineering at UC Berkeley





Jasper H. N. Yik, PhD Adjunct Professor

A. Hari Reddi, PhD Distinguished Professor, Lawrence J. Ellison Chair of Musculoskeletal Biology



# **Adult Reconstruction Service**



John P. Meehan, MD Associate Clinical Professor, Chief and Fellowship Director



Paul E. DiCesare, MD Professor and Chair



Amir A. Jamali, MD Associate Professor

Most people expect to remain productive and physically fit at any age; this is especially true in northern California. The manner in which we live, work, and exercise has a dramatic impact on the quality of our lives. Our group of fellowship-trained surgeons has treated more than 1000 patients each year. Our service is patient-focused and has had a long history of exceptional and successful care.

The Adult Reconstruction Service is designed to help patients in need of primary or revision hip or knee replacement or other joint preservation procedures. Additionally, our group actively conducts research with the objective of providing the best outcomes for all our patients. We offer innovative technology and treatment options, including minimal incision surgery, computer-assisted surgery, hip resurfacing and arthroscopy, and state-of-the-art pain management strategies that speed recovery and minimize postoperative pain.

The service conducted a successful recruit of an additional Adult Reconstruction surgeon, Dr. Gavin Pereira, who comes to us from Coventry, England, and will be joining the department in January 2011. Dr. Pereira has completed fellowships in both Trauma and Adult Reconstructive Surgery.

In October 2009, Dr. Di Cesare was invited to be a guest lecturer at the Department of Traumatologic and Orthopaedic Surgery at the University of Malaga in Malaga, Spain. He served as a member of the subcommittee that developed the AAOS Guidelines on the Diagnosis of Periprosthetic Joint Infections of the Hip and Knee. Dr. Di Cesare was appointed to the Adult Reconstruction-Hip Program Subcommittee of the AAOS. He is currently serving on the search committee for the Chair of the Department of Surgery at UC Davis Health System.

Dr. Amir Jamali was program chair for for the COA Annual Meeting QME course. Dr. Jamali's research focus is on specialization of cartilage preservation surgery.

This past year, Dr. John Meehan was the recipient of an OREF Fellowship Award for \$72,000, which pays salary and benefits for our 2010-2011 fellow; he also received an Omega Grant in the amount of \$30,500 to be used for the Adult Reconstruction Fellowship. Dr. Meehan was awarded a \$25,000 "Vision" Grant by the UC Davis Health System National Board of Advisors for his research project "Assessing Patient Outcomes After Simultaneous Bilateral Total Knee Arthroplasty Versus Staged Bilateral Total Knee Arthroplasty."

The Adult Reconstruction Service concentrates on the care of patients with major joint arthritis.

Common referrals are for osteoarthritis, post-traumatic arthritis, avascular necrosis and arthritis secondary to hemophilia.

# **Foot and Ankle Service**

he Orthopaedic Foot & Ankle Service at UC Davis has grown substantially since August 2008, when Dr. Eric Giza assumed the position of service chief. The service now has two busy clinic and surgery days each week.

Dr Giza continues to educate and train the PGY4 residents and has had numerous publications in the past two years. The highlight publications include a two year outcomes study on cartilage transplantation in the talus, a cadaver study on Achilles tendon repair with augmentation and a Journal of Bone and Joint Surgery publication on treatment of Achilles tendon rupture.

The Foot & Ankle Service began the Orthopaedic Summer Scholar program in 2009 by providing research opportunities to students interested in Orthopaedics between their first and second year of medical school. The 2009 candidate has one publication and two accepted abstracts, and the 2010 student has developed a cadaver study protocol.

The service will be expanding by adding a fellowship and second faculty member in 2012 or 2013.

Dr. Giza has participated as a faculty instructor at the Foot and Ankle Fellows Course in Naples, Florida in April 2010. There, he instructed over 30 of the current Orthopaedic Foot and Ankle Fellows in the United States. In July 2010, Dr. Giza presented an abstract, gave a lecture and moderated sessions at the American Orthopaedic Foot and Ankle Society Annual meeting in Baltimore, Maryland. Dr. Giza continues to work with Major League Soccer as their medical information coordinator. In January, 2011, Dr. Giza will present his work on the development of an injury and medical record system for Major League Soccer at the Annual Soccer Industry Sports Medicine Symposium.



Eric Giza, MD Assistant Professor and Chief

The goals of the service are to provide Sacramento and Northern California with the highest quality of care for the diagnosis, treatment, and prevention of foot and ankle problems.

#### Academic Personnel Actions Effective 7/1/2009

#### PROMOTIONS

Dr. Robert Allen - Assistant Professor Step 4, promoted to Associate Professor Step 1, **HSCP** Series Dr. Mark Lee - Assistant Professor Step 4 promoted to Associate Professor Step 1, Clinical X Series

#### MERIT

Dr. Paul Di Cesare - Rank Professor, Regular Series, Current Step 3 Dr. Eric Klineberg - Rank Assistant Professor, Clinical X Series, Current Step 3 Dr. Richard Marder - Rank Professor, HSCP Series, Current Step 5 **Dr. Debra Popejoy -** Rank Assistant Professor, Clinical X Series, Current Step 3 Dr. Roberto Rolando - Assistant Professor Step 4 Clinical X Series to Assistant Professor Step 5HSCP Series (note change in series)

### **FY10** Faculty & Student **Data Totaling 105**



## Hand and Upper Extremity Service



Robert M. Szabo, MD, MPH Professor, Chief and Fellowship Director



Robert H. Allen, MD Associate Clinical Professor

The intricate design and frequent use of our hands and upper extremities each day makes this part of our bodies highly susceptible to injury and disease. The UC Davis Orthopaedic Hand & Upper Extremity Service specializes in treating patients with common and complex, traumatic and acquired disorders of the hand and upper extremity. Our team combines the best in clinic, education and research for our patients.

We have experience and expertise in a wide range of conditions, such as arthritis of the hand; trigger finger; fingertip injuries and amputations; intersection syndrome; DeQuervain's tenosynovitis; compresssion neuropathies; Dupuytren's Disease; tumors of the hand; and the hand in cerebral palsy, just to name a few. Common procedures performed are brachial plexus and peripheral nerve surgery; congenital deformities, including Ilizarov reconstructions; shoulder, elbow and wrist joint replacements; wrist reconstruction, including arthroscopy; tumors; and microvascular reconstructive free tissue transfers.

The Hand & Upper Extremity Service attracts patients from the entirety of northern California, southern Oregon, and western Nevada, with private patients traveling from New York, New Orleans, Washington State and Mexico. The service performs over 600 procedures each year.

We have a strong relationship with the Japanese orthopaedic and hand surgery community. Hand Service faculty have been invited to lecture in Japan on two separate occasions. In September 2009, two ASSH International Japanese Traveling Fellows visited our service. In addition, a distinguished Japanese hand surgeon from Kagawa came to observe Dr. Szabo for the entire month of November 2009. The only other centers this surgeon visited in the US were the Mayo Clinic and Harvard. Our primary research focus, both clinically and in the laboratory, is on nerve compression syndromes. A major emphasis on early laboratory efforts has focused on examining the effect of compression on the tibial nerve on a rat model. Specific aim had been to characterize the response of peripheral nerves to intermittent compression with a goal of understanding the role of repetitive motion, as seen in cumulative trauma, in the pathophysiology of nerve compression. In the laboratory, an animal model was developed to study end-to-side nerve regeneration through silicone tubules and examine the effects of growth factors on nerve regeneration and repair. Another research focus is biomechanics of fracture fixation specifically with determining the role of locking, non-locking and hybrid fixation in the hand. In addition, Dr. Szabo has a strong interest in clinical research design and outcome studies that can contribute to the foundation of evidence-based medicine.

The following are highlights for the past fiscal year:

- In March 2010, the Hand Service was awarded a fellowship grant for \$25,000 from the Orthopaedic Research and Education Foundation (OREF) for fellowship year 2010-2011.
- Dr. Szabo assumed the role of President of the Americfan Society for Surgery of the Hand (ASSH) in September 2009. He will serve until October 2010 and will preside over the 65th Annual ASSH Meeting in Boston, MA, October 7-9.
- In September 2009, Dr. Szabo received an Honorary Member Award from the American Society of Hand Therapists (ASHT).
- Dr. Szabo was recognized as one of American's Top Doctors for Cancer by Castle Connolly Medical, Ltd. in November 2009.
- In April 2010, Dr. Szabo was recognized for his distinguished contributions as a speaker at the 53rd Annual Meeting of the Japanese Society for Surgery of the Hand (JSSH).

# **Oncology Service**

The UC Davis Orthopaedic Oncology Service is dedicated to providing care for both children and adults with primary benign and malignant tumors within bone or soft tissues. The service pursues aggressive treatment of metastatic skeletal lesions to prevent threatened fracture or to stabilize completed fractures. The primary thrust is in the area of limb salvage for malignant tumors of the extremities.

In September 2008, Dr. Robert Tamurian assumed the role of chief of the service. Since then, the oncology practice has experienced sustainable growth, serving patients from northwest Nevada, southwest Oregon, and all of northern California. Dr. Tamurian routinely schedules about 50 outpatient encounters and performs 6 to 8 major procedures per week. This has resulted in a 400% increase in clinical productivity in the last 12 months. With his skills as a limb salvage expert, Dr. Tamurian has added new dimensions to the department's surgical repertoire. His philosophy of care is for the preservation of life and limb, while battling aggressive musculoskeletal benign and malignant tumors. He continually strives to improve the functional outcomes of his patients through sustained development of limb sparing surgical techniques.

Dr. Tamurian is an instructor in the musculoskeletal course for second year medical students. He actively participates in the education of visiting medical students enrolled in the Orthopaedic Acting Internship course through daily instruction in the operating room and clinical setting. In the past year, Dr. Tamurian has had one manuscript published and has one currently in press with the American Journal of Orthopaedics. He was the co-author on two published abstracts, and both abstracts were presented at the 2010 American Society of Clinical Oncology (ASCO) Annual Meeting in Chicago in June 2010. In November 2009, Dr. Tamurian presented on high-risk orthopaedics at the National Association of Orthopaedic Nurses, Sacrament Chapter Annual Workshop in Sacramento.

Dr. Tamurian continues to serve as Assistant Residency Program Director for the department. He is also the Co-chair of the Sarcoma and Musculoskeletal Tumor Board, an integral component of the UC Davis Sarcoma Treatment Center, which provides multidisciplinary care for patients with musculoskeletal tumors and sarcoma. He also serves on the Orthopaedic Committee for Quality Improvement as a member at large and regularly attends monthly meetings. On a national level, he has been selected by the department chair to represent UC Davis while serving as a member of the Board of Trustees to the Musculoskeletal Transplant Foundation, regarding the appropriate use of musculoskeletal allograft tissues.

Dr. Tamurian's research focuses on biomechanics related to metastatic and primary bone tumor defects. As a result, he has been collaborating with the Orthopaedic Research Laboratory, to identify the assets that are in place to begin work on four research projects. Two of these projects have grant support from industry in the amount of \$37,500 in product and materials to complete the biomechanical studies. Another grant of \$18,750 is associated with an NIH RO1 subcontract. This is a multi-center trial, and Dr. Tamurian serves as the principle investigator at UC Davis.



Robert M. Tamurian, MD Assistant Professor and Assistant Residency Director

# **Pediatrics Service**



Michelle A. James, MD Clinical Professor and Chief



Jennette L. Boakes, MD Clinical Professor and Fellowship Director



George T. Rab, MD Professor



Peter B. Salamon, MD Clinical Professor



Debra J. Popejoy, MD Assistant Professor



Joel A. Lerman, MD Assistant Clinical Professor

The Pediatric Orthopaedics Service was proud to graduate three fellows in 2010. Dr. Teresa Mosqueda, pediatric orthopaedic fellow, entered private practice in Des Moines, Iowa; Dr. Carolien de Rood, pediatric hand fellow, joined Children's Mercy Hospital in Kansas City as Director of Hand and Upper Extremity Surgery, and Dr. Fatema Iqbal, musculoskeletal pediatrics fellow, joined Shriners Hospital for Children, Northern California, as a pediatrician specializing in musculoskeletal conditions. Dr. Lisa Maskill will serve as pediatric orthopaedic fellow for 2010-2011; she completed her orthopaedics residency in Grand Rapids, and plans to return there to practice after completing her fellowship.

Shriners Hospital recently hosted a satellite program of the Perry Initiative, under the direction of Dr. Michelle James, and with the help of Dr. Susan Tseng, several UC Davis medical students, and representatives of orthopaedic implant manufacturers. This program, originated and organized by Drs. Lisa Lattanze and Jenni Buckley of UC San Francisco, is designed to introduce high school girls to orthopaedic surgery and biomedical engineering. Nineteen local students had a wonderful time dissecting pigs' legs, learning how to suture, implanting femoral rods in sawbones, and testing the pullout strength of pedicle screws.

Dr. Jenny Boakes was recently awarded a Shriners' Hospital for Children Planning Grant to design a multi-center study of the long term outcomes of limb lengthening or amputation on lower extremity impairment and function. Dr. Joel Lerman is designing a multi-center study of bracing methods following Ponseti treatment for clubfeet, and Dr. Debra Popejoy is studying the radiographic outcomes of extension spica casting for pediatric femur fractures. Dr. George Rab has retired from the Ben Ali Chair position at Shriners Hospital, and continues to build on his extensive work on motion analysis of the extremity by incorporating muscle architecture into his model. Dr. Michelle James' multi-center study of outcomes of various treatments for upper extremity cerebral palsy received continued funding for its 5th year. Dr. James also mentored first year medical student Patrick Curran, who was awarded a Medical Student Research Grant to study thumb kinematics in the Motion Analysis Lab.

Dr. James is the current President of the Shrine Surgeons Association. She was appointed Deputy Editor for Hand/Wrist of the *Journal of Bone and Joint Surgery* in 2010, and continues to serve on the Board of Directors of the American Board of Orthopaedic Surgery, and the Orthopaedic Residency Review Committee of the ACGME.

# **Spine Service**

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m T}$ he Spine Service at UC Davis has grown tremendously in the last ten years. The service has four staff, Dr. Rolando Roberto, Dr. Eric Klineberg, Dr. Munish Gupta, and Dr. Daniel Benson, professor emeritus. Dr. Gupta has served as the Chief of the Spine Service and Co-director of the Spine Program for the last five years.

The Spine Program has an office at the "C" Street Cannery Office Park. The Spine Program is an integrated, comphrehensive program that includes Orthopaedics, Neurosurgery and PM&R, as well as Pain Medicine. The Spine Program is the only program in this region that includes all specialties that treat spinal conditions. This program has been extremely successful financially as well as clinically. The referrals and out put have continued to improve over the last four years.

The Spine Service has a large educational component with two residents rotating through every three to four months. The PGY3 and PGY4 residents that rotate are frequently enchanted by the spine experience. Last year, three out of five graduating residents went into spine. The year before, two of the four went on to do fellowships in orthopaedic spine surgery and chose spine as their career in Orthopaedics.

Our service has had a fellowship program for twenty years, and recently has expanded that program from one fellow to two. One fellow is stationed at the Shriners Hospital for Children and the other is here at UC Davis. The fellows rotate every three months. The rotation allows the added experience of pediatric spine deformity and provides more time for research.

The Spine Program has an annual CME course for primary care physicians, held every spring, called "Fingers To Toes". This has been extremely successful in

Northern California, growing every year and attracting participants from Bakersfield, CA to Oregon. The program is tailored to primary care physicians, physical therapists and physician's assistants, and it includes all of the subspecialties of Physical Medicine, Pain Medicine, Neurology, and Orthopaedics.

The Spine Service has been very productive in molecular biology and biomechanical research. The biomechanical research by Dr. Rolando Roberto has included analysis of the biomechanical behavior of cervical spine after total disc replacement. Dr. Klineberg and Dr. Gupta collaborated on a project that analyzed disc degeneration in an animal model, using bio-mechanics and magnetic resonance imaging. Dr. Gupta and Dr. Klineberg have been successful studying the role of BMPs and BMP antagonists in posterior spinal fusion in an animal model. They successfully analyzed spatial and temporal relationships in BMPs and BMP antagonists using immuno-histochemistry and RT-PCR.

The research program also includes clinical research, where follow-up of patients with adult scoliosis after surgery using BMP and instrumentation has been studied to see if BMP augments spinal fusion and avoids using patients' own iliac crest as auto-graft. These examples are just a sample of the research being done in the Spine Program.

Overall, the Spine Program has grown and continues to excel in patient care, research and education

The Spinal Disorders Service encompasses the evaluation and treatment of both pediatric and adult spinal disorders.



Munish C. Gupta, MD Professor, Chief and Spine Center Co-Director



Daniel R. Benson, MD Professor Emeritus



Eric O. Klineberg, MD Assistant Professor and Fellowship Director



Rolando F. Roberto, MD Assistant Clinical Professor and Residency Director

# **Sports Service**



Richard A. Marder, MD Clinical Professor and Chief



Cassandra A. Lee, MD Assistant Professor



Kirk J. Lewis, MD Associate Clinical Professor and Fellowship Director



James M. Van den Bogaerde, MD Assistant Clinical Professor

During 2009-2010, Sports Medicine continued a strong clinical, teaching and service commitment and initiated new and basic science research studies. As in the past, our service ranked in the top quartile of patient care, with high marks in patient satisfaction. With the addition of Cassandra A. Lee, MD, the service has increased to four full-time positions.

Under Dr. Kirk Lewis and Dr. Richard Marder, in conjunction with their nonoperative sports medicine associates, sports team coverage has expanded on the UC Davis campus, while our liaison with the Sacramento Kings has been solidified, marking nearly a quarter of a century of continuous professional team coverage.

Dr. Lewis has developed a highly appreciated resident operative teaching program, using a state of the art cadaver lab. Dr. James Van den Bogaerde started a basic science biomechanics project which studies distal biceps injuries at the elbow. Dr. Marder is currently working on several manuscripts, one being accepted for publication by the Journal of Shoulder and Elbow Surgery.

Dr. Van den Bogaerde was appointed president of the Lipscomb Alumni Society and is currently organizing quarterly CME lectures for local orthopaedics as part of an educational outreach program sponsored by the alumni society. Dr. Van den Bogaerde has developed a busy shoulder and elbow service at UC Davis, treating a wide variety of traumatic and degenerative conditions of the shoulder and elbow, including complex revision procedures and advanced arthroscopic techniques. He is also pursuing a cadaveric study on distal bicepstendon repair at the Lawrence J. Ellison Musculoskeletal Research Center. Dr. Van den Bogaerde is also providing medical coverage for US Alpine Ski Team events.

Dr. Lee's surgical specialties include ligament reconstruction, cartilage preservation, such as osteochondral allograft and autologous chondrocyte implantation, meniscal transplantation, and multiligamentous knee reconstruction. She also specializes in arthroscopic shoulder procedures, such as SLAP and rotator cuff repairs, as well as open shoulder reconstruction procedures. Dr. Lee's current research interests involve studying cartilage regeneration and ligament biology and how they translate to clinical outcomes.

The Sports Medicine team has added a new fellowship that was accredited by the ACGME for their first year beginning in 2010-2011.

UC Davis Sports Medicine is a comprehensive, integrated and multidisciplinary center providing medical, surgical, preventive, rehabilitative and performance improvement services for athletes and individuals pursuing a physically active lifestyle.

# **Trauma Service**

The Orthopaedic Trauma Service is an integral part of the multispecialty trauma services that provide a Level 1 Trauma Referral Center for northern California. portions of Nevada and southern Oregon. Working closely with General Surgery, Neurosurgery, Anesthesiology, and many other specialty services at the UC Davis Medical Center, the Orthopaedic Trauma Service provides comprehensive 24-hour-aday service specializing in the patient with complex, multiple system injuries. Early stabilization of fractures and aggressive rehabilitation of victims of major trauma are emphasized.

Specialized surgical techniques employed are closed intramedullary fixation and combinations of internal and external fixation. Complex fracturs of the pelvis, acetabulum, and extremities are of particular interest, as are treatment of nonunions, malunions, and leg-length discrepancies using closed intramedullary shortening, Ilizarov, and osteotomy techniques. Innovative treatment modalities, such as synthetic bone and new forms of internal and external fixation, as well as stem cell research, are coordinating with the ongoing work of the Orthopaedic Research Laboratories and the Department of Biomedical Engineering.

The Orthopaedic Trauma Service continues to be one of the busiest services at the

hospital. Our Trauma Fellowship remains one of the most prestigious and sought after fellowships in the country. Applications for fellowship positions have nearly tripled in the past four years. With the help of grant funding, our fellowship program has grown to include a third trauma fellow for training this year.

#### Some highlights this year include:

Philip Wolinsky, MD, became a member of the American College of Surgeons and recently received appointment to their Committee on Trauma. He received an Achievement Award this year by the American Academy of Orthopaedic Surgeons (AAOS).

The American Academy of Orthopaedic Surgeons (AAOS) appointed Dr. Mark Lee to their Match Oversight Committee. He was appointed chairman of the Fellowship and Career Choices Committee by the Orthopaedic Trauma Association.

Brad Yoo, MD, became an active member in the Orthopaedic Trauma Association (OTA).

Tania Ferguson, MD, became a member of the AO North America Teaching faculty. She is currently completing her MPH degree through the University of California, Davis.



Philip R. Wolinsky, MD, FACS Professor and Chief



Tania A. Ferguson, MD Assistant Professor



Mark A. Lee, MD Associate Professor and Fellowship Director



Brad J. Yoo, MD Assistant Professor

The trauma team provides comprehensive 24-hour service specializing in the patient with multiple system injuries.

# Guest speakers this past year...

#### SEPTEMBER 2009

#### Grand Rounds - September 15

Guest Speaker, Kyriakos Athanasiou, PhD University of California, Davis, Department of Biomedical Engineering, *"Tissue Engineering of Articular Cartilage"* 

**Grand Rounds - September 22** Guest Speaker, Stephen Skinner, MD Oakland Children's Hospital *"Emergency Pediatric Fracture Care in California"* 

#### Lipscomb Lectureship - September 23

Guest Speaker, William Sterett, MD Steadman Hawkins Clinic, Vail, Colorado "Allograft vs. Autograft ACL Reconstruction"

#### OCTOBER 2009

#### **Research Symposium - October 16**

Guest Speaker, Prof. Dr. Mats Paulsson Institute for Biochemistry, Cologne, Germany "Role of Matrilins and COMP in Cartilage Matrix Assembly and in the Pathogenesis of Chondrodysplasias"

#### NOVEMBER 2009

#### Grand Rounds - November 17

Guest Speaker, Daniel Link, MD University of California, Davis Department of Radiology *"Vascular Malformations"* 

#### Grand Rounds - November 24

Guest Speaker, LtCol Nathan L. Taylor, USAF, MC, FS Landstuhl Regional Medical Center, Landstuhl/ Kirchberg, Germany, *"Emergency War Surgery and Damage Control Orthopaedics"* 

#### DECEMBER 2009

#### Daniel Benson Lectureship - December 1

Guest Speaker, Harry L. Shufflebarger, MD Miami Children's Hospital, Pediatric Spinal Surgery "Treatment of Idopathic Scoliosis - 1960 - 2009 and What the Future Looks Like"

"How to Treat High Grade Spondylolisthesis and How to Avoid Complications and Failures"

#### Lipscomb Lectureship - December 2

Guest Speaker, Mark R. Safran, MD Stanford University Orthopaedics, "*Hip Arthroscopy 101*"

#### FEBRUARY 2010

#### Grand Rounds - February 4

Guest Speaker, Jon R. Davids, MD Shriner's Hospital, Greenville, South Carolina "The Crisis in Academic Medicine in the USA: Economics, Professionalism, and the Social Contract"

#### Grand Rounds - February 16

Guest Speaker, Tom Friermood, MD Panorama Orthopaedics and Spine Center, Golden, Colorado *"Practice Management 101: Developing a Successful Practice in Changing Economic Times"* 

#### **MARCH 2010**

#### Grand Rounds - March 30

Guest Speaker, Paul R. T. Kuzyk, MASc, MD, FRCS(C) University of Toronto, Department of Surgery *"Subtrochanteric Femur Fractures"* 

#### **APRIL 2010**

**Grand Rounds - April 20** Guest Speaker, Joseph M. Lane, MD New York Presbyterian Hospital, Orthopaedic Trauma *"Osteoporisis - Diagnosis and Treatment"* 

#### MAY 2010

**Grand Rounds - May 25** Guest Speaker, James Ryaby, PhD Orthopaedic Research and Consultant, Ryaby Associates, LLC *"Biophysical Regulation of Bone Formation"* 

#### **JUNE 2010**

#### Resident/Fellow Graduation - June 18 Guest Speaker, Joseph Borrelli, Jr, MD University of Texas Southwestern Medical School Orthopaedics "Evolving Treatment of Acetabular Fractures" "The Development of Posttraumatic Osteoarthritis Animal Model"

# Portrait of a grateful patient Lillian Cannady



Lillian and her son, Aaron M. Cannady

As a child, Lillian's father remarked that her gait looked funny. But she never mentioned the pain to her family.

"When I was in elementary school, I'd try to keep up with the rest of the kids - but my legs and back would start burning," she says. "I'd be standing there waiting for it to stop, while the other kids were leaving. Back then folks never really went to the doctor unless it was life-threatening. I just thought that was the way it was and kept quiet."

As she grew older and pursued careers in banking in California and child-care administration in Texas, Lillian continued quietly dealing with the pain in her legs. She just thought that's what life was about.

"Boy, did the right side give me pain, Lord have mercy!" she says. "I did everything in pain."

Lillian eventually had surgery on her left hip to help relieve the effects of bone deterioration. She'd previously undergone a separate operation to fuse discs in her spine after a back injury she sustained while lifting a child at her job as an administrator of a child care center. Recovery from the surgeries took years. While she continued on with life, Lillian's hip pain still followed her.

Then a twist came. Lillian received a call from her former husband, who said it was time for Lillian to move back to California - and told her they had great doctors at UC Davis. She decided he was right.

Settling in Fairfield, Lillian decided it was time to do something. Due to the previous surgeries, and the ever-present pain, her gait had changed. By favoring her left hip, the constant wear and tear had worn down her right hip, too.

Lillian contacted the UC Davis Department of Orthopaedics and was seen by Dr. Paul Di Cesare, a nationally renowned expert on hip and knee replacement surgery and the university's Michael W. Chapman Chair of Orthopaedic Surgery. Dr. Di Cesare recommended a replacement of her right hip.

The experience was much different than what Lillian expected - when she woke from the operation, she had to ask the nurse if the doctors had actually performed the surgery, "*There was no pain!*" she says. "*Yes, there was discomfort, but I was used to serious pain.*"

Healing swiftly, Lillian is dedicated to her recovery and does her exercise diligently. "I use the exercise equipment, I keep in shape, I eat healthy and I haven't had any problems," she says. "The pain was like living in darkness and now I have light because I don't have pain."

When asked if this is why she gave a gift to the Department of Orthopaedic Surgery, she said: "I love the advancement medical technology has made. I greatly admire surgeons. You have the choice to be anything you want to be, but it takes certain people to become surgeons. Because when they can rebuild people or do surgery that can help people, I just think that is the most wonderful thing in the world. And Dr. Di Cesare is good. You see, I do not know surgery without pain. For me to wake up and have almost no pain was wonderful."

And now, nearly 40 years later, Lillian is remarrying her sweetheart who brought her back to California.





**Fiscal Overview** 

When comparing FY10 to FY09, professional charges increased 12.3, while professional payments decreased 2.4 percent.

The department finished the close of fiscal year 2010 with \$533,138,585 total charges and \$99,828,260 net income.

#### **Extramural Grant Dollars**

The department's extramural grants were mainly awarded through private industry.

*In FY10, we received \$193,000 in NIH funding and \$455,000 from other institutions.* 





Are you interested in becoming a donor? please contact:

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Phone: 916.734.9673 kathryn.keyes@ucdmc.ucdavis. edu

# Clinical Productivity Snapshots

In FY10, we experienced a 12.4 percent growth in work RVUs compared to FY09. This was largely due to an improved internal release system for operative block and clinic room reallocation.





Our Department's operative volumes continue to increase from year to year. In FY10, our hand service had the most prominent increase with 761 cases in FY10, compared to 610 cases in FY09.

Our Ellison Ambulatory Clinic and Spine Center experienced a 1.9 percent growth in visits when compared to last fiscal year. Additional hospital based clinic locations include J Street in Sacramento and the Center for Placer Health. Our Sports Medicine and Joint physicians also have a presence at Folsom and Roseville Primary Care Network (PCN) locations.



### **Total Clinic Visits**

# **Our Trainees**

Faculty committed to resident education and training, top-notch facilities and the opportunities for diverse patient care, research and academic pursuits make UC Davis an ideal place to train.

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#### Acting Intern to Resident

Holly Hale, MD - Trauma Service, April 2009 Kent Sheridan, MD - Trauma Service, August 2009 Mark Sucher, MD - Trauma Service, October 2009

Also starting residency training in June 2010 are Jose Mejia-Oneto, MD and Cyrus Taghavi, MD

#### **Residents PGY1**



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Porter, MD Powers, MD Whitlow, MD

Jose Sukanta Bosque, MD Maitra, MD

#### **Residents PGY2**







Philbert Huang, MD

Raj Kullar. MD Mitsunaga, MD

Daemeon Nicolaou, MD

#### **Residents PGY2**



The Denny and Jeanene Dickenson Resident **Research Fellow** 

Lance



Derek

Amanatullah, MD

Joel Williams, MD

#### **Residents PGY3**



Tomasz Antkowiak, MD Bromfield, MD

Gauray

Abbi, MD

**Residents PGY4** 

Christian

Jonathan

Eastman, MD



Eddie

Lo, MD





Tyler

#### Residents PGY5 graduated 6/18/10



Randall Farac, MD Sports Medicine Fellowship at Orthopaedic Institute in Van Nuys, CA



Jaspaul Gogia, MD Spine Fellowship at Hospital for Special Surgery in New York, NY



Safdar Khan, MD Spine and Scoliosis Reconstructive Fellowship at Rush University in Chicago, IL



Christopher Kreulen, MD Sports Medicine Fellowship at UC. Los Angeles

Jerry Labson, MD serving in US Air Force at Osan Air Force Base in Republic of Korea

#### Adult Reconstruction Fellow



Yeukkei (Roy) Cheung, MD **Pediatrics** Fellow



Teresa Mosqueda-Ferguson, MD



Jason Lowe, MD



Kyle Mitsunaga, MD Spine Fellowship at Stanford University in Palo Alto, CA

#### Hand/Upper Extremity Fellow



Shima Sokol, MD

#### Spine Fellow



Mario Luna, MD



Michael Leslie, DO



Tseng, MD



Nathe, MD

### Selected Publications for the Last Year

2010 Cheung I, Amanatullah DF, Di Cesare PE, Wound Complications in Hip Arthoplasty - Treatment and Prevention. Surgery of the Hip, DJ Berry and JR Lieberman, editors, Elsevier, New York, NY \*\*IN PRESS\*\*

2010 James MA, Amanatullah DF. Upper Limb Transverse Deficiency. Pediatric Orthopaedic Knowledge Update 4. \*\*IN PRESS\*\*

2010 Amanatullah DF. Surgical Intern Survival Guide. Einstein Journal of Biology and Medicine. \*\*IN PRESS\*\*

2010 Amanatullah DF, Cheung Y, Di Cesare PE. Hip Resurfacing Arthroplasty: A Review of the Evidence for Surgical Technique, Outcome, and Complications. Orthop Clin N Am, 41(2010): 263-272.

2010 Kong L, Tian Q, Guo F, Mucignat MT, Perris R, Sercu S, Merregaert J, Di Cesare PE, Liu CJ. Interaction between cartilage oligomeric matrix protein and extracellular matrix protein 1 mediates endochondral bone growth. Matrix Biol., Feb. 4.

2010 Neu CP, Reddi AH, Komvopoulos K, Schmid TM, Di Cesare PE. Friction Coefficient and Superficial Zone Protein is Increased in Patients with Late-stage Osteoarthritis. Arthritis Rheum, 2010(May 24): Epub ahead of print.

2010 Di Cesare PE. Current Treatment Options for Osteonecrosis of the Femoral Head. Am J Orthop. \*\* IN PRESS \*\*

2010 Amanatullah DF, Landa J, Strauss E, Garino J, Kim S, Di Cesare PE. Comparison of Surgical Outcomes and Implant Wear between Ceramic-on-Ceramic and Ceramicon-Polyethylene Articulations in Total Hip Arthroplasty. J Arthroplasty. \*\* IN PRESS \*\*

2010 Motaung SCKM, Di Cesare PE, Reddi AH. Differential Response of Cartilage Oligomeric Matrix Protein (COMP) to morphogens of Bone Morphogenetic Protein/Transforming growth factor-beta family in the surface, middle and deep zones of Articular Cartilage. J Tissue Engineering and Regenerative Medicine. \*\* IN PRESS \*\*

2010 Di Cesare PE, Cheung Y: Chapter 106: Wound Complications, Della Valle CJ,Berry D, Lieberman JR, (ed), Berry's Surgery of the Hip, Elsevier. \*\* IN PRESS \*\*

2010 Giza E, Annahita K, Sarcon MS & Kreulen C. Case Report: Tibiotalar Nonunion Corrected by Hindfoot Arthrodesis. Foot & Ankle Specialist, 3(2): 76-79.

2010 Panchbhavi VK, Aronow MS, DiGiovanni BF, Giza E, Grimes JS, Harris TG, Roberts MM & Straus B. Foot and Ankle Experience in Orthopedic Residency: An Update. Foot & Ankle International, 31(1): 10-13.

2010 Giza E, Sullivan M, Ocel D, Lundeen G, Mitchell M, Frizzell L. First metatarsophalangeal hemiarthroplasty for hallux rigidus. Int Orthop.

2010 Khan SN, Lee MA, Gupta MC. Preface. Evidence-based medicine in orthopedic surgery. Orthop Clin North Am, 41(2): xiii.

2010 Lo EY, Eastman J, Tseng S, Lee MA, Yoo BJ. Neurovascular risks of anteroinferior clavicular plating. Orthopedics, 33(1): 21.

2010 Hak DJ, Lee MA & Gotham DR. Influence of prior fasciotomy on infection following open reduction and internal fixation of tibial plateau fractures. (MS# 15297) The Journal of Trauma. \*\* IN PRESS \*\*

2010 Eastman JG, Tseng SS, Lee MA & Yoo BJ. Injury to intraarticular structures of the knee during retropatellar intramedullary nailing of tibia fractures (MS# JOT2666). Journal of Orthopaedic Trauma. \*\* IN PRESS \*\*

2010 Eastman JG, Tseng SS, Lo E, Li CS, Yoo BJ & Lee MA. Retropatellar technique for intramedullary nailing of proximal tibia fractures: A cadaveric assessment (MS# JOT2362R1). Journal of Orthopaedic Trauma. \*\* IN PRESS \*\*

2010 Cardoso R, Szabo RM. "Wrist Anatomy and Surgical Approaches." Hand Clinics, 26(1): 1-19.

2010 Szabo RM. "Perioperative Antibiotics for Carpal Tunnel Surgery." Journal of Hand Surgery, 35(1): 122-124.

2010 de Roode CP, James MA, McCarroll HR. Abductor Digit Minimi Opponensplasty: Technique, modifications, and measurement of opposition. Tech Hand Up Extrem Surg, 14(1): 51-3.

2010 McCarroll HR, James MA, Newmeyer WL, Manske PR. Madelung's Deformity. Diagnostic thresholds of radiographic meausrments. J Hand Surg Am, 35(5): 807-12.

2010 McCarroll HR, James MA. Very distal radial osteotomy for Madelung's Deformity. Tech Hand Up Extrem Surg, 14(2): 85-93.

2010 James MA. Unilateral Upper Extremity Transverse Deficiencies: Prosthetic Use and Function. Journal of Pediatric Orthopaedics, 30(March): S40-S44.

2010 de Roode CP, James MA, Van Heest AE. Tendon transfers and releases for the forearm, wrist, and hand in spastic hemiplegic cerebral palsy. Tech Hand Up Extrem Surg, 14(2): 129-34.

2010 Campbell AJ, Bagley A, Van Heest A, James MA. Challenges of randomized controlled surgical trials. Orthop Clin North Am, 41(2): 145-55.

2010 Szabo RM. "Dorsal Intercarpal Ligament Capsulodesis." Master Techniques in Orthopaedic Surgery: The Wrist, 3rd Edition. Gelberman RH (Editor), Lippincott, Williams & Wilkins, Philadelphia, PA, Chapter 21, pp. 235-242.

2010 Szabo RM, Newland CC. "Ligamentous Repair for Acute Lunate and Perilunate Dislocations." Master Techniques in Orthopaedic Surgery: The Wrist, 3rd Edition. Gelberman RH (Editor), Lippincott, Williams & Wilkins, Philadelphia, PA, Chapter 22, pp. 243-261.

2010 Szabo RM, "Sauve Kapandji Procedure." Master Techniques in Orthopaedic Surgery: The Wrist, 3rd Edition, Gelberman RH (Editor), Lippincott, Williams & Wilkins, Philadelphia, PA, Chapter 35, pp. 399-409.

2010 Amanatullah DF, Ngann KK, Borys D, Tamurian RM. Case Report: Progression of Aggressive Metastatic Carcinosarcoma After Treatment of Epithelioid Osteosarcoma. Orthopedics, 33(6):445, June.

2010 Tamurian RM, Amanatulla D. Pelvic Osteoid Osteoma in a Skeletally Mature Female. The American Journal of Orthopedics. \*\*IN PRESS\*\*

2010 Leslie M, Ferguson TA, Jamali A & Wolinsky PR: Fixation of femoral head fractures. Techniques in Orthopaedics. \*\*IN PRESS\*\*

2010 Tejwani N, Webb L, & Wolinsky PR: Mangled extremities: Limb salvage vs amputation. American Academy of Orthopaedic Surgeons Instructional Course Lectures. Book Chapter \*\*IN PRESS\*\*

2010 Wolinsky PR, Dennis D, Curtiss S & Hazelwood SJ. The mechanical effect of screw number and "locked" versus "nonlocked" proximal locking bolts on intramedullary fixation of proximal third tibia fractures. Journal of Orthopaedic Trauma. \*\*IN PRESS\*\*

2010 Haudenschild DR, Chen J, Pang N, Lotz MK, D'Lima DD. Rho Kinase-Dependent Activation of Sox9 in Chondrocytes. Arthritis & Rheumatism, 62(1): 191-200.

2010 Haudenschild DR, Chen J, Pang N, Steklov N, Grogan SP, Lotz MK, D'Lima DD. Vimentin contributes to changes in chondrocyte stiffness in osteoarthritis. J Orthop Res.

2010 Hong E, Di Cesare PE, Haudenschild DR. Role of c-MAF in Chondrocyte Differentiation: A Review. Cartilage. \*\* IN PRESS \*\*

2010 Chan SM, Neu CP, Duraine G, Komvopoulos K, Reddi AH. Atomic force microscope investigation of the boundary-lubricant layer in articular cartilage. Osteoarthritis Cartilage.

2010 Ferguson TA, Patel R, Bhandari M, Matta JM. "Fractures of the Acetabulum in Patients Aged 60 Years and Older: An Epidemiology And Radiological Study. The Journal of Bone and Joint Surgery British Edition, 92-B(2): 250-7.

2010 Lowe JA, Crist BD, Bhandari M, Ferguson TA. Optimal Treatment of Femoral Neck Fractures According to Patient Physiologic Age-An Evidence Based Review. Orthopaedic Clinics of North America, 41(2):157-66.

2010 Fritz AT, Reddy D, Meehan JP, Jamali AA. Femoral neck exostosis, a manifestation of cam/pincer combined femoroacetabular impingement. Arthroscopy, 26(1):121-27.

Jamali AA, Fritz AT, Reddy D, Meehan JP. Minimally invasive bone grafting of cysts of the femoral head and Acetabulum in femoroacetabular impingement: arthroscopic technique and case presentation. Arthroscopy, 26(2):279-85.

2010 Kim S, Meehan JP, Jamali AA. Changes in Medicare diagnosis related group (DRG) system for primary and revision hip and knee replacements and their implications on hospital reimbursement. Current Orthopaedic Practice, 21(2):120-25.

2010 White RH, Meehan JP, Romano PS. Re: Does aspirin have a role in venous Thromboembolism prophylaxis in total knee arthroplasty patients? J Arthroplasty, 25(4):667-68.

2010 Kim S, Boye KS. Obesity and incremental hospital charges among patients with and without diabetes in the United States. Value in Health, 12(5): 723-29.

2010 Kim Y, Kim S, Kim H. Disenrollment from a home and community-based long-term care program to a nursing home: Ohio's experience. International Journal of Public Policy. \*\* IN PRESS \*\*

2010 Kim YM, Lee CA, Matava MJClinical Results of the Arthroscopic, Single-bundle, Trans-tibial Posterior Cruciate Ligament Reconstruction: A Systematic Review AMJSPORTS/071746

2010 Klineberg, E; Gupta M; Cervical Open Posterior Reduction of Facet Dislocation, Spine Trauma; Patel, Burger, Brown ed, Springer. July

2010 Choi, G, Klineberg E, ; Gupta M. Anterior Treatment of Thoracolumbar Burst Fractures, Spine Trauma; Patel, Burger, Brown ed, Springer. July

2010 Tang, Y, Ye, X; Klineberg, E; Curtiss, S; Maitra, S; Gupta, M; Temporal and spatial expression of BMP's and BMP antagonists during posterolateral lumbar fusion, Spine \*\*In Press\*

2010 Macagno; O'Brien, M; Hook H; Betz, R; Lonner, B; Shah, S; Crawford, A; Letko, L; Abel, M; Flynn, J; M. Gupta; Efficacy of hemivertebra resection for congenital scoliosis (CS); A multicenter restrospective comparison of three surgical techniques. Hemivertebra resection for congenital scoliosis. Harms Study Group Book. Two Chapters. \*\*In Press\*\*

2010 Stein-Wexler; Ton, J; Gupta M. Rib head protrusion into the central candal in type 1 neurofibromatosis. Pediatric Radiology Journal. \*\*In Press\*\*

2010 Roberto, R; Klineberg, E; Complications in the Treatment of Subaxial Cervical Fractures and Dislocations. The Cervical Spine – Chapter 107 Lippincott Williams & Wilkins \*\*In Press\*\*

2010 Roberto, R; The Natural History of Cardiac and Pulmonary Function Decline in Patients with Duchenne Muscular Dystrophy. Spine Journal Submission F11006R1 \*\*In Press\*\*

2010 Roberto, R; Kinematics of Progressive Circumferential Ligament Resection (Decompression) in Conjunction With Cervical Disc Arthroplasty in a Spondylotic Spine Model. Spine Journal May

2010 Klineberg, E. Cervical Spondylotic Myelopathy: A Review of the Evidence. Orthopedic Clinics of North America, April

2010 Tang, Y, Ye, X, Klineberg, E, Curtiss, S, Maitra, S, Gupta, MC Temporal and spatial expression of BMP's and BMP antagonists during posterolateral lumbar fusion, , Spine \*\*In Press\*\*

2010 Mroz, TE; Abdullah, K; Steinmetz, MP; Klineberg, E; Lieberman, IH; Radiation exposure to the surgeon during percutaneous pedicle screw placement, J Spinal Disord Tech, \*\*In Press\*\*

2010 Klineberg, E; Wang, J, Butler; J, Ferrara; L, Benzel; Chapter 136 - Basic Biomechanically Relevant Anatomy, EC, Spine Surgery: Techniques, Complications, Avoidance and Management, 3rd Edition, Benzel ed., Elsevier Science Inc, Philadelphia, PA

2010 Klineberg, E, Gupta M. Cervical Open Posterior Reduction of Facet Dislocation, Spine Trauma; Patel, Burger, Brown ed, Springer. July

2010 Choi, G, Klineberg, E, Gupta M. Anterior Treatment of Thoracolumbar Burst Fractures, Spine Trauma; Patel, Burger, Brown ed, Springer. July

2010 Samandouras ed. Klineberg, E. Spinal Injuries Section, The Neurosurgeon's Handbook, Oxford University Press. March

2010 Zochowski CG, Salgado CJ, Jamali AA. Extensive muscle necrosis and infection following treatment of a lower extremity vascular malformation with Sotradecol and absolute ethanol. Blood Coagul Fibrinolysis. 2010 Jul;21(5):480-6.

2010 Bargar WL, Jamali AA, Nejad AH. Femoral anteversion in THA and its lack of correlation with native acetabular anteversion. Clin Orthop Relat Res. 2010 Feb;468(2):527-32. Epub 2009 Aug 28.

2010 Ryan JA, Jamali AA, Bargar WL. Accuracy of computer navigation for acetabular component placement in THA. Clin Orthop Relat Res. 2010 Jan;468(1):169-77. Epub 2009 Jul 24.

2010 Salgado CJ, Jamali AA, Ortiz JA, Cho JJ, Battista V, Mardini S, Chen HC, Gonzales R. Effects of hyperbaric oxygen on the replanted extremity subjected to prolonged warm ischaemia. J Plast Reconstr Aesthet Surg. 2010 Mar;63(3):532-7. Epub 2009 Mar 24.

2010 Yoo BJ, Beingessner DM, Barei DP. Stabilization of the posteromedial fragment in bicondylar tibial plateau fractures: a mechanical comparison of locking and nonlocking single and dual plating methods. J Trauma. 2010 Jul;69(1):148-55.

Lo EY, Eastman J, Tseng S, Lee MA, Yoo BJ. Neurovascular risks of anteroinferior clavicular plating. Orthopedics. 2010 Jan 1;33(1):21.

2010 Neu CP, Reddi AH, Komvopoulos K, Schmid TM, Di Cesare PE. Friction coefficient and superficial zone protein are increased in patients with advanced osteoarthritis. Arthritis Rheum. 2010 May 24.

2010 Rab, G.T., Oblique Tibial Osteotomy Revisited. Journal of Children's Orthopaedics, 4(2):169-172. \*\*IN PRESS\*\*

Jones CN, Tuleuova N, Lee JY, Ramanculov E, Reddi AH, Zern MA, Revzin A. Cultivating hepatocytes on printed arrays of HGF and BMP7 to characterize protective effects of these growth factors during in vitro alcohol injury. Biomaterials. 2010 Aug;31(23):5936-44.

2010 Chan SM, Neu CP, Duraine G, Komvopoulos K, Reddi AH. Atomic force microscope investigation of the boundary-lubricant layer in articular cartilage. Osteoarthritis Cartilage. 2010 Jul;18(7):956-963.

2010 Rolando Roberto MD, Anto Fritz MD, Yolanda Hagar, Braden Boice M., Andrew Skalsky MD, HoSun Hwang MD, Laurel Beckett PhD, Craig McDonald MD, Munish Gupta MD. The Natural History of Cardiac and Pulmonary Function Decline in Patients with Duchennes Muscular Dystrophy, Department of Orthopedics, University of California, Davis, Department of Public Health Sciences, Division of Biostatistics, University of California, Davis, School of Medicine, University of California, Davis, Department of Physical Medicine and Rehabilitation, University of California, Davis. Manuscript accepted July 2010, Spine

2010 R. F. Roberto, T. McDonald, S. Curtiss, P. Neu, K. Kim, and F. Pennings. Kinematic Effects of Progressive Circumferential Ligament Resection (Decompression) in Conjunction with Cervical Disc Arthroplasty in a Spondylotic Spine Model, Spine 35(18): 1676-1683.

2010 Roberto R, Klineberg E. Complications In the Treatment of Subaxial Fractures and Dislocations, Cervical Spine Research Society Textbook, Chapter 106. Pending Publication 2010

2010 Boakes JL. Disorders of the Child's Foot. In Pediatric Orthopaedics for the Primary Care. In press.

2010 Rab GT, Oblique Tibial Osteotomy Revisited. Journal of Children's Orthopaedics, 4(2):169-172.

2010 Bouxsein, M.L., Boyd, S.K., Christiansen, B.A., Guldberg, R.E., Jepsen, K.J., Müller, R., Guidelines for assessment of bone microstructure in rodents using microcomputed tomography, Journal of Bone and Mineral Research, DOI: 10.1002/jbmr.141.

2010 Iyer, S., Christiansen, B.A., Roberts, B.J., Valentine, M.J., Manoharan, R., and Bouxsein, M.L., A biomechanical model for estimating loads on thoracic and lumbar vertebrae. Clinical Biomechanics, DOI: 10.1016/j.clinbiomech.2010.06.010.

2010 Samelson, E.J., Christiansen, B.A., Demissie, S., Broe, K.E., Meng, C-A, Yu, W., Cheng, X., O'Donnell, C.J., Hoffmann, U., Genant, H.K., Kiel, D.P., Bouxsein, M.L., Reliability of vertebral fracture assessment using multidetector CT lateral scout views: the Framingham osteoporosis study. Osteoporosis International, DOI: 10.1007/s00198-010-1290-6.

2010 Christiansen, B.A., Bouxsein, M.L. Methods in small animal imaging. For "Osteoporosis Research: Animal Models", In Press.

2010 Christiansen, B.A., Bouxsein, M.L. Biomechanics of Vertebral Fractures and the Vertebral Fracture Cascade. For "Current Osteoporosis Reports - Epidemiology and Pathophysiology", In Press.

2010 Lowe JA, Crist BD, Bhandari M, Ferguson TA. Optimal treatment of femoral neck fractures according to patient's physiologic age: an evidence-based review. Orthop Clin North Am. Apr;41(2):157-66. Review.

2010 Genetos DC, Toupadakis CA, Raheja LF, Wong A, Papanicolaou SE, Fyhrie DP, Loots GG, Yellowley CE. Hypoxia decreases sclerostin expression and increases Wnt signaling in osteoblasts. J Cell Biochem. May 15;110(2):457-67.

2010 Fyhrie DP. On the Horizon from the ORS Journal of the American Academy of Orthopaedic Surgeons, 18, 1 59-59.

2010 Becerra J, Andrades JA, Guerado E, Zamora-Navas P, Lopez-Puertas JM, Reddi AH. Articular cartilage: structure and regeneration. Tissue Eng Part B Rev. 2010 Sep 14. [Epub ahead of print]

2010 Yu K, Meehan JP, Fritz A, Jamali AA. Osteochondroma of the femoral neck: a rare cause of sciatic nerve compression. Orthopedics. 2010 Aug 11;33(8). doi: 10.3928/01477447-20100625-26. PMID: 20704099

2010 Roberto RF, McDonald T, Curtiss S, Neu CP, Kim K, Pennings F. Kinematics of progressive circumferential ligament resection (decompression) in conjunction with cervical disc arthroplasty in a spondylotic spine model. Spine (Phila PA 1976). 2010 Aug 15;35(18):1676-83. PMID: 20508554

2009 Ciarelli TE, Tjhia C, Rao DS, Qiu S, Parfitt AM, Fyhrie DP. Trabecular packet-level lamellar density patterns differ by fracture status and bone formation rate in white females. Bone. 2009 Nov;45(5):903-8. Epub 2009 Jul 14.PMID: 19615479

2009 Meehan JP, Jamali AA, Ryan JA. Pantaloon hip spica cast and constrained liner for the treatment of early total hip dislocation in a young patient with sickle cell disease. Am J Orthop (Belle Mead NJ). 2009 Dec;38(12):E184-6. PMID: 20145795

2009 Sheffler LC, Hanley C, Bagley A, Molitor F, James MA. Comparison of self-reports and parent proxy-reports of function and quality of life of children with below-the-elbow deficiency. J Bone Joint Surg Am. 2009 Dec;91(12):2852-9. PMID: 19952247

2009 Gajendran VK, Szabo RM, Myo GK, Curtiss SB. Biomechanical comparison of double-row locking plates versus single- and double-row non-locking plates in a comminuted metacarpal fracture model. J Hand Surg Am. 2009 Dec;34(10):1851-8. Epub 2009 Nov 7. PMID: 19897325

2009 Lee SY, Nakagawa T, Reddi AH. Mesenchymal progenitor cells derived from synovium and infrapatellar fat pad as a source for superficial zone cartilage tissue engineering: analysis of superficial zone protein/lubricin expression. Tissue Eng Part A. 2010 Jan;16(1):317-25. PMID: 19702511

2009 Christiansen BA, Kotiya AA, Silva MJ. Constrained tibial vibration does not produce an anabolic bone response in adult mice. Bone. 2009 Oct;45(4):750-9. Epub 2009 Jul 1. PMID: 19576309

2009 Kishimoto KN, Oxford CL, Reddi AH. Stimulation of the side population fraction of ATDC5 chondroprogenitors by hypoxia. Cell Biol Int. 2009 Dec;33(12):1222-9. Epub 2009 Jun 12. PMID: 19524690

Jamali AA. Digital templating and preoperative deformity analysis with standard imaging software. Clin Orthop Relat Res. 2009 Oct;467(10):2695-704. Epub 2009 May 15. PMID: 19444527

2009 Entwistle RC, Sammons SC, Bigley RF, Hazelwood SJ, Fyhrie DP, Gibeling JC, Stover SM. Material properties are related to stress fracture callus and porosity of cortical bone tissue at affected and unaffected sites. J Orthop Res. 2009 Oct;27(10):1272-9. PMID: 19382182

2009 Shea KG, Rab GT, Dufurrena M. Pathological Fracture After Migration of Cement Used to Treat Distal Femur Physeal Arrest. Journal of Pediatric Orthopaedics, 18(4): 185-1887.

2009 Walker JL, Knapp DF, Minter C, Boakes JL, Salazar JC, Sanders JO, Lubicky JP, Drvaric DM, Davids JR. Adult Outcomes Following Amputation or Lengthening for Fibular Deficiency. J Bone Joint Surg 91A(4): 797-804, 2009.

2009 Bonds CW, James MA. Posterior deltoid-to-triceps tendon transfer to restore active elbow extension in patients with tetraplegia. Tech Hand Up Extrem Surg, 13(2): 94-97.

2009 Sheffler LC, Hanley C, Bagley A, Molitor F, James MA. Comparison of self-reports and parent proxy-reports of function and quality of life of children with below-the-elbow deficiency. J Bone Joint Surg Am, 91(12): 2852-9.

2009 Bannerman P, James MA. Molecular mechanisms to improve nerve regeneration following damage to the immature peripheral nervous system. J Bone Joint Surg Am, 91 Suppl 4: 87-89.

2009 Bednar MS, James MA, Light TR. Congenital Longitudinal Deficiency. Journal of Hand Surgery, 34A: 1739-47.

2009 Satoh A, James MA, Gardiner DM. The role of nerve signaling in limb genesis and agenesis during axolotl limb regeneration. J Bone Joint Surg Am, 91 Suppl 4: 90-98.

2009 Ty JM, James MA. Failure of differentiation: Part II (Arthrogryposis, Camptodactyly, Clinodactyly, Madelung's Deformity, Trigger Finger, and Trigger Thumb). Hand Clin, 25(2): 195-213.

UC Davis Medical Center's Surgery and Emergency Services Pavilion combines the latest in technological advances with a focus on patient care to allow UC Davis to meet a growing community's critical health needs. This state-of-the-art addition, a 472,000 square foot facility, is the largest, most complex and most far-reaching building project ever undertaken by UC Davis.



Following eight years of construction and more than a year of extensive planning for the transition, departments have moved into UC Davis Medical Center's new Surgery and Emergency Services Pavilion.

The trauma and emergency department will be named for internationally known orthopaedic surgeon Michael Chapman. The Michael W. Chapman Trauma Center honors Chapman, who is considered one of the fathers of modern trauma surgery and served two decades as chair of the



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Michael and Betty Chapman

UC Davis Department of Orthopaedic Surgery. Adjacent to the trauma center, the Elizabeth C. Chapman Emergency Department Waiting Room recognizes Chapman's wife, Elizabeth. Together, the couple has given or secured more than \$9 million in contributions to UC Davis, including making a lead gift toward the Pavilion for the naming of this room.

UC Davis Medical Center is a leading referral center for the most seriously injured or ill patients, and the most medically complex cases in a region spanning 33 counties, encompassing more than 65,000 square miles and 6 million residents. UC Davis operates inland Northern California's only level I trauma center, with comprehensive adult and pediatric emergency departments.



All orthopaedic specialists began operating in the new Surgery Pavilion in September 2010. The Surgery and Emergency Services Pavilion will increase access to essential health services for the Sacramento region and beyond, including:

#### The Michael W. Chapman Emergency and Trauma Center

that allows more patients to receive critical care more quickly, and includes special facilities designed for pediatric patients and their families

**Technology-enabled surgery suites** that allow UC Davis surgical teams to collaborate with experts around the world

in real-time to provide the best possible outcomes for patients

A world-class cardiovascular center that uses the most sophisticated imaging and diagnostic equipment for minimally invasive procedures

#### An expanded Firefighters Burn Institute Regional Burn Center

that provides recovering burn victims with enhanced therapeutic resources

A robotic-enabled pathology laboratory that enhances patient care through faster, highly accurate test results

#### Advanced imaging services

that offer emergency-care teams immediate access and proximity to high-resolution CT scanners, MRI and digital radiography, ensuring rapid diagnoses, treatment and care of emergency patients