

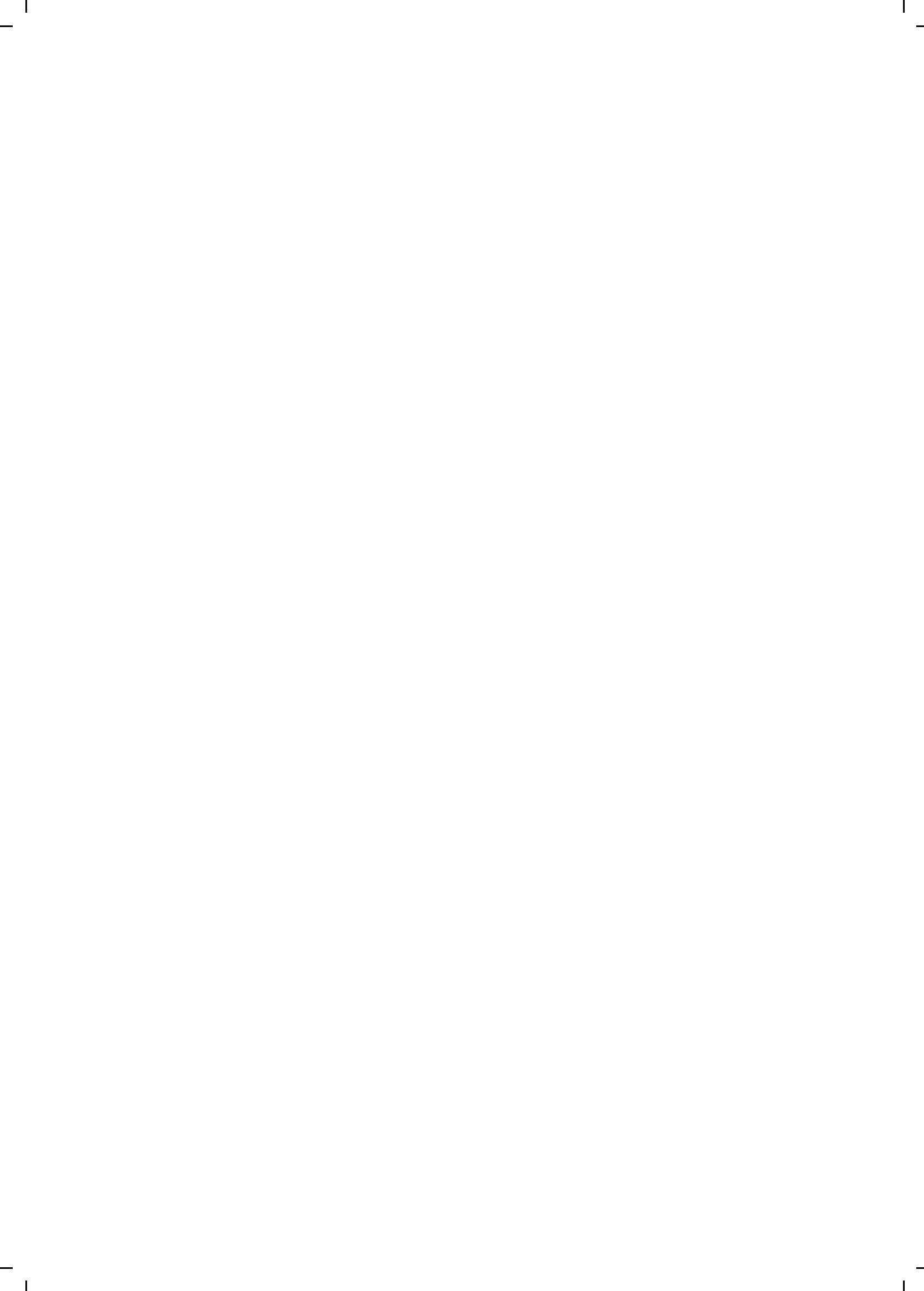


Department of
Orthopaedic Surgery

Graduate Research Symposium

June 18, 2021





WELCOME TO THE 2021 PAUL R . LIPSCOMB ALUMNI SOCIETY GRADUATE RESEARCH SYMPOSIUM

This outstanding gathering is an opportunity for our department to highlight scientific as well as clinical research, and to reconnect with clinical faculty and alumni who have served our department over the years.

Our special guests this year are: Dr. Todd J. Albert, MD, Surgeon-in-Chief Emeritus at Hospital for Special Surgery and Professor of Orthopedic Surgery at Weill Cornell Medical College; and Pamela Robey, PhD, Senior Investigator at the National Institute of Dental and Craniofacial Research.

Most importantly, this is an occasion to commemorate the graduation of five outstanding residents into the ranks of orthopaedic surgery. While always a bittersweet occasion, this day validates the wonderful camaraderie and continuity of our field. Thank you for being part of this memorable event.

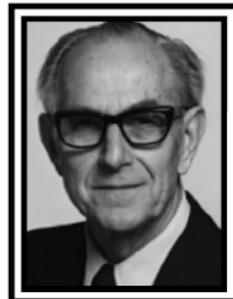


Department of
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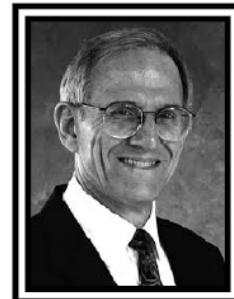




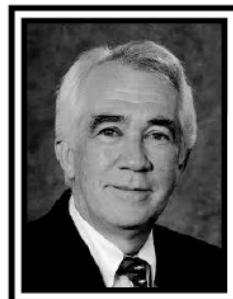
ORTHOPAEDIC SURGERY CHAIRS



*Paul R. Lipscomb, M.D.
Professor Emeritus
Chair 1969-1979*



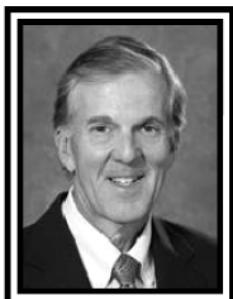
*Michael W. Chapman, M.D.
Professor Emeritus
Chair 1979-1999*



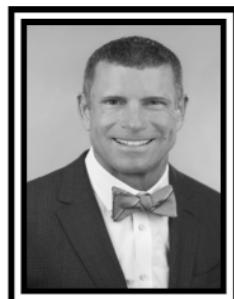
*George T. Rab, M.D.
Professor
Emeritus Chair 1999-2006*



*Paul E. Di Cesare, M.D., FACS
Professor and Chair
Michael W. Chapman Chair
2006-2011*



*Richard A. Marder, M.D.
Professor and Chair
Michael W. Chapman Chair
2011- 2018*



*R. Lor Randall, M.D., FACS
Professor and Chair
The David Linn Endowed Chair
2018- present*

FACULTY:

University of California, Davis Health

Robert H. Allen, MD

Professor, Hand, Upper Extremity, & Microvascular Surgery

Christopher O. Bayne, MD

Associate Professor, Chief of Hand, Upper Extremity, & Microvascular Surgery

Blaine A. Christiansen, PhD

Associate Professor, Orthopaedic Research Laboratory

Jonathan G. Eastman, MD

Associate Professor, Trauma Service

Ellen P. Fitzpatrick, MD

Assistant Professor, Trauma Service

David P. Fyhrie, PhD

Professor, Orthopaedic Research Laboratory

Mauro Giordani, MD

Professor, Chief of Adult Reconstructive Service

Eric Giza, MD

Professor, Chief of Foot and Ankle Service

Dominik R. Haudenschild, PhD

Professor, Orthopaedic Research Laboratory

Brian M. Haus, MD

Associate Professor, Chief of Pediatric Orthopaedic Service

Maury L. Hull, PhD

Orthopaedic Surgery and Professor Emeritus, Department of Mechanical and Aerospace Engineering

Yashar Javidan, MD

Associate Professor, Adult and Pediatric Spine Service

Eric O. Klineberg, MD

Professor, Chief of Adult and Pediatric Spine Service, Vice Chair of Administration

Christopher D. Kreulen, MD

Assistant Professor, Foot and Ankle Service

J. Kent Leach, PhD

Professor, Vice Chair of Orthopaedic Research Laboratory, and Biomedical Engineering

Hai V. Le, MD

Assistant Professor, Adult and Pediatric Spine Service

Cassandra A. Lee, MD

Professor, Chief of Sports Medicine Service, Residency Program Director

Mark A. Lee, MD

Professor, Chief of Trauma Service, Vice Chair of Education

Holly B. Leshikar, MD

Assistant Professor, Pediatric Orthopaedic Service

Richard A. Marder, MD

Professor, Sports Medicine Service

John P. Meehan, MD

Professor, Adult Reconstructive Service

Gavin C.T. Pereira, MBBS, FRCS

Associate Professor, Adult Reconstructive Service

R. Lor Randall, MD, FACS

Professor and Chair, Orthopaedic Surgery, The David Linn
Endowed Chair

A. Hari Reddi, PhD

Professor, Orthopaedic Research Laboratory

Rolando F. Roberto, MD

Professor, Adult and Pediatric Spine Service

Robert M. Szabo, MD, MPH

Professor, Hand, Upper Extremity, and Microvascular Surgery

Steven W. Thorpe, MD

Assistant Professor, Chief of Orthopaedic Oncology

James M. Van Den Bogaerde, MD

Professor, Sports Medicine Service

Barton L. Wise, MD

Professor, Vice Chair of Clinical Research Orthopaedic Surgery,
Internal Medicine

Philip R. Wolinsky, MD

Professor, Trauma Service

FACULTY :

Shriners Hospital for Children, Northern California

Jennette L. Boakes, M.D.

Clinical Professor Pediatric Orthopaedic Service

Jon R. Davids, M.D.

Clinical Professor, Assistant Chief of Pediatric Orthopaedic Surgery

Nicole A. Friel, MD

Assistant Clinical Professor, Pediatric Orthopaedic Service

Michelle A. James, M.D.

Clinical Professor, Chief of Pediatric Orthopaedic Service

Vedant A. Kulkarni, M.D.

Assistant Clinical Professor, Pediatric Orthopaedic Service

Joel A. Lerman, M.D.

Associate Clinical Professor, Pediatric Orthopaedic Service

Mary Claire Manske, M.D.

Assistant Clinical Professor, Pediatric Orthopaedic Services

Candice McDaniel, M.D.

Assistant Clinical Professor, Pediatric Orthopaedic Services

Debra J. Templeton, M.D.

Associate Clinical Professor, Pediatric Orthopaedic Service

VISITING PROFESSORS

- 1982 — Robert B. Winter, MD**
- 1983 — Anthony Catterall, MD**
- 1984 — Eugene E. Bleck, MD**
- 1985 — Paul P. Griffin, MD**
- 1986 — M. Mark Hoffer, MD**
- 1987 — Robert B. Salter, MD**
- 1988 — Colin F. Moseley, MD**
- 1989 — James R. Gage, MD**
- 1990 — James F. Kellman, MD**
- 1991 — David S. Bradford, MD**
- 1992 — Adrian E. Flatt, MD**
- 1993 — Augusto Sarmiento, MD**
- 1994 — M. Mark Hoffer, MD**
- 1995 — James R. Andrews, MD**
- 1996 — James R. Urbaniak, MD**
- 1997 — Stuart L. Weinstein, MD**
- 1998 — Robert A. Mann, MD**
- 1999 — Joseph M. Lane, MD**
- 2000 — Andrew J. Weiland, MD**
- 2001 — Joel M. Matta, MD**
- 2002 — Terry R. Trammell, MD**
- 2003 — Kaye E. Wilkins, MD**
- 2004 — Richard Gelberman, MD**
- 2005 — Robert H. Hensinger, MD**
- 2006 — James Heckman, MD**
- 2007 — Thomas A. Einhorn, MD**
- 2008 — Joseph A. Buckwalter, MD**
- 2009 — Peter J. Stern, MD**
- 2010 — Joseph Borrelli, Jr., MD**
- 2011 — Keith Bridwell, MD**
- 2012 — Gary G. Poehling, MD**
- 2013 — Robert Anderson, MD**

VISITING PROFESSORS

- 2014 — Jeffrey Eckardt, MD**
- 2015 — J. Tracy Watson, MD**
- 2015 — Matthew L. Warman, MD**
- 2016 — Stuart B. Goodman, MD**
- 2016 — Cosimo De Bari, PhD**
- 2017 — Frank P. Luyten, MD, PhD**
- 2017 — Marc J. Philippon, MD**
- 2018 — Michael W. Chapman, MD**
- 2018 — Joseph A. Buckwalter, MD**
- 2019 — Nobel Laureate, Mario R Capecchi, PhD**
- 2019 — Thomas P. Vail, MD**
- 2021 — Todd J. Albert, MD**
- 2021 — Pamela G. Robey, PhD**

FRIDAY, JUNE 18 , 2021

- 7:00 AM Continental Breakfast**
- 7:30 AM Welcome – Department Chair, R Lor Randall, MD**
- 7:35 AM Introduction of Guest Speaker (Research): R Lor Randall, MD**
- 7:40 AM THE A. HARI REDDI ORTHOPAEDIC RESEARCH LECTURESHIP**
BASIC SCIENCE VISITING PROFESSOR: Pamela Robey, Ph.D. – National Institute of Dental and Craniofacial Research – "Skeletal Stem Cells: What They Are and How They Can Be Used in Tissue Engineering"
- 8:40 AM Introduction of Research Resident: J Kent Leach, PhD**
- 8:45 AM 2020-2021 DICKENSON RESEARCH RESIDENT: Max Haffner, MD**
"Gender and Ethnic Diversity in Orthopaedic Residency in Comparison to Other Surgical Specialties"
- 8:55 AM Introduction of Graduating Chief Residents: Mark Lee, MD**
- 9:00 AM RESIDENT: Daniel O'Connor, MD – "Opioid Use in Revision Total Knee Arthroplasty"**
- 9:12 AM RESIDENT: Patrick Michelier, MD – "Development of a Novel Humerus Fracture Brace with Auto-Adjusting Circumferential Pressure"**
- 9:24 AM RESIDENT: Ryan Anderson, MD – "Clinical and Radiographic Comparison Between Open Versus Minimally Invasive Transforaminal Lumbar Interbody Fusion with Bilateral Facetectomies"**
- 9:36 AM RESIDENT: John Wuellner, MD – "Video Fluoroscopic Swallow Analysis of Patients Undergoing Anterior Cervical Spine Surgery"**
- 9:48 AM RESIDENT: Augustine Saiz, MD – "Unexpected Return to the OR in Orthopaedic Trauma Fracture Surgery"**
- 10:00 AM Special Presentation**
- 10:05 AM Break**
- 10:20 AM Introduction of Guest Speaker (Clinical): R. Lor Randall, MD**
- 10:25 AM THE MICHAEL AND BETTY CHAPMAN LECTURESHIP**
DISTINGUISHED VISITING PROFESSOR: Todd J. Albert, MD – "30 Years of Discovery: Disc Degeneration/Herniation/Regeneration - Molecular Basis to Patient Reported Outcomes"
- 11:25 AM Lunch / Department Photos**
- 12:25 PM Introduction of PGY-2 Residents: Barton Wise, MD**
- 12:30 PM RESIDENT: Judas Kelley, MD – "3D Mapping of Periprosthetic Distal Femur Fractures**

- 12:40 pm RESIDENT: William Ip, MD** - "PROMIS Scores in Children and Adolescents Undergoing ACL Reconstruction"
- 12:50 PM RESIDENT: Terri Zachos, MD, PhD, DVM** - "Optimization of Microvascular Anastomosis Techniques for Upper Extremity Free Tissue Transfer"
- 1:00PM RESIDENT: Edmond O'Donnell, MD** - "Role of Cancer Stem Cells in the Development of Drug-Resistance in Soft Tissue Sarcoma"
- 1:10 PM Wyatt Vander Voort, MD** - "The Impact of Sarcopenia in Geriatric Hip Fracture Patients"
- 1:20 PM Adjournment**

Michael and Betty Chapman Lectureship

Dr. Michael Chapman's modern, aggressive approaches to the treatment of patients with multiple system injuries resulted in improved recovery times and outcomes for severe fractures, earning him recognition as one of the founding fathers of modern trauma surgery. Dr. Michael "Mike" Chapman and his wife, Mrs. Elizabeth "Betty" Chapman have been long time supporters of UC Davis Health and the Department of Orthopaedic Surgery. Dr. Chapman, is a UC Davis alumnus and chairman emeritus of the Department of Orthopaedic Surgery at UC Davis Medical Center. In 1991, the Chapman's established the Michael W. & Elizabeth C. Chapman Endowed Research Fund to support research in the Department of Orthopaedic Surgery. Dr. Chapman is a former trustee and chair of the UC Davis Foundation (2001-2007, 2010-2016). Mike and Betty were instrumental in securing many multi-million dollar gifts to the medical school from alumni, friends, and grateful patients as well as cultivating donors for the Mondavi Center (performing arts center). Dr. Chapman is the 2018 recipient of the UC Davis Medal, the highest honor UCD bestows on individuals to celebrate extraordinary contributions that embody the campus' vision of excellence. Mike and Betty are members of UC Davis CAAA, Davis Chancellor's Club, UCD Shields Society, UCDH Heritage Circle, Leadership Giving Society, life-long supporters of the Mondavi Center's producers Circle, and namesake to the Lipscomb-Chapman Orthopaedic Alumni Society. The annual resident graduation symposium clinical lecture is named in honor of their tremendous service to UC Davis Health and Orthopaedics.



Todd J. Albert, MD

Distinguished Professor

Surgeon-in-Chief Emeritus
Hospital for Special Surgery
Chairman Emeritus, Department of Orthopedic Surgery
Professor of Orthopedic Surgery
Weill Cornell Medical College Hospital for Special Surgery

Dr. Todd J. Albert is Surgeon-in-Chief Emeritus at Hospital for Special Surgery. He is a Professor of Orthopedic Surgery at Weill Cornell Medical College.

Dr. Albert specializes in the field of orthopedic spine surgery focusing on disorders of the cervical spine. He has an interest in minimally invasive surgical techniques and image-guided technologies in the management of spinal disorders.

He serves on the boards of several scholarly journals and is Past President of The Cervical Spine Research Society and President of the Scoliosis Research Society. Dr. Albert is the author of seven books and more than 40 book chapters, and has published over 375 peer-reviewed and non-peer-reviewed articles. He has presented his research both nationally and internationally, and served as chairman at numerous courses.

Previously, Dr. Albert was Chairman of the Department of Orthopaedics and President of The Rothman Institute at Thomas Jefferson University Hospital in Philadelphia. He graduated from Amherst College, University of Virginia School of Medicine and completed his residency in orthopedic surgery at Thomas Jefferson University Hospital where he was named outstanding chief resident, and performed a fellowship in spinal surgery at the Minnesota Spine Center.

A. Hari Reddi Orthopaedic Research Lectureship

Dr. A. Hari Reddi was recruited to UC Davis in 1997 as the Lawrence J. Ellison Endowed Chair by Dr. Michael W Chapman. Dr. Reddi was previously the Virginia Percy Chair at Johns Hopkins University School of Medicine in the Department of Orthopaedic Surgery (1991-1997), Chief of Bone Cell Biology Section in the NIH (1977-1991) and Assistant Professor in the Ben May Laboratory for Cancer Research in the University of Chicago (1972-1977). He is well known for his research on Bone Morphogenetic Proteins (BMPs) and regeneration of bone and cartilage. He was the recipient of the inaugural Marshall R. Urist Award of the Orthopaedic Research Society (ORS) in 1997 and the Nicolas Andry Award of the Association of Bone and Joint Surgeons in 1999. Dr. Reddi was elected as a Fellow of the National Academy of Inventors in 2015. Today we announce the inaugural resident graduation symposium lecture established in his honor. The A. Hari Reddi Orthopaedic Research Lectureship was established to honor his career and continued legacy within the Department of Orthopaedic Surgery.



Pamela G. Robey, PhD

Distinguished Professor

Senior Investigator

National Institute of Dental and Craniofacial Research

Dr. Robey received her BA from Susquehanna University in Selinsgrove, PA, and her MS and PhD from the Catholic University in Washington, DC. She did her post-doctoral work at the National Institute of Arthritis, Metabolism and Digestive Diseases (now the National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS)) on the role of defective phosphorylation of enzymes leading to lysosomal storage disease, and a staff fellowship in the National Eye Institute, where she studied retinal and ocular connective tissue diseases. Dr. Robey joined NIDCR in 1983 and established reproducible methods for culturing human bone-forming cells, in order to study the development of mineralized matrix formation. In 1992, Dr. Robey was appointed chief of Skeletal Biology Section. Dr. Robey has served as a Co-Coordinator of the NIH Bone Marrow Stromal Cell Transplantation Center (2008-2013), and is currently the acting Scientific Director of the NIH Stem Cell Characterization Facility.

Dr. Pamela Robey focuses on four main areas in skeletal cell biology: 1) determination of the characteristics and the biological properties of post-natal bone marrow stromal cells (BMSCs), a subset of which are multipotent skeletal stem cells (SSCs), able to recreate cartilage, bone, cells that support blood formation and fat cells in the marrow; 2) elucidation of the role of enzymatic matrix remodeling in the maintenance of SSC function; 3) characterization of the role that BMSCs/SSCs play in skeletal diseases; and, 4) development of techniques for cartilage and bone regeneration in human patients with skeletal defects. In addition to using BMSCs for tissue engineering, Dr. Robey and her group also explore the potential of pluripotent stem cells to differentiate into cartilage and bone as another source of cells for skeletal regeneration.



Ryan L Anderson, MD, MS

Chief Resident

Education:

Undergraduate School: UC Irvine
Graduate School: Columbia University
Medical School: UC Davis

Next Step:

Orthopaedic Spine Surgery Fellowship at UC San Diego

Career Objective:

To become a great technical surgeon with excellent relationships with my patients.

Soon-to-be Wife:

Tricia Ota

Personal Statement:

The past five years have been the most challenging and rewarding years of my life. I feel very fortunate to have trained at UC Davis and learned from the top surgeons in various subspecialties of orthopaedics. Exposure to a unique, yet broad patient population fostered memorable experiences helping to solidify my knowledge and enhance my sense of empathy for others. I will continue to strive for excellence as a communicator, diagnostician, and surgeon. I am also so very grateful for my fiancée, her family, and my own family, who have continued to support me on this long, never ending journey to becoming an orthopaedic surgeon.

Clinical and Radiographic Comparison Between Open Versus Minimally Invasive Transforaminal Lumbar Interbody Fusion With Bilateral Facetectomies

Hai Le, MD, Ryan Anderson, MD, Eileen Phan, MA, Joseph Wick, MD, Joshua Barber, MD, Rolando Roberto, MD, Eric Klineberg, MD, Yashar Javidan, MD

Purpose:

To compare radiographic and clinical outcomes after open versus minimally invasive transforaminal lumbar interbody fusion (MIS-TLIF) with bilateral facetectomies.

Methods: We retrospectively compared patients who underwent single- or 2-level MIS-TLIF with an age- and sex-matched open-TLIF cohort. Surgical data was collected for operative time, estimated blood loss (EBL), and drain use. Clinical outcomes included the Visual Analog Scale (VAS), Oswestry Disability Index (ODI), length of stay (LOS), complications, and reoperations. Lumbar radiographs were measured for changes in global lumbar lordosis (LL) and segmental lordosis (SL).

Results: Between 2016 and 2020, 38 MIS-TLIF patients were compared with 38 open-TLIF patients. No subfascial drain was used in the MIS-TLIF group ($P < .001$). The MIS-TLIF group had longer operative time (310.8 vs 276.5 minutes; $P = .046$) but less EBL (282.4 vs 420.8 mL; $P = .007$). LOS ($P = .15$), complication rates ($P = .50$), and revision rates ($P = .17$) were equivalent. VAS and ODI improved but did not differ between groups. In the open-TLIF group, LL and SL were restored or improved in 81.6% and 86.9% of cases, respectively. In the MIS-TLIF group, LL and SL were restored or improved in 86.8% and 97.4% of cases, respectively. There were no differences in changes in LL and SL between groups.

Conclusion: Compared with the age- and sex-matched open-TLIF cohort, patients undergoing MIS-TLIF had reduced EBL and subfascial drain use but increased operative time. There were no differences in complications, reoperations, or LOS. Both groups demonstrated improvement in VAS and ODI. MIS-TLIF with bilateral facetectomies provided equivalent improvements in global and segmental LL.



Patrick Michelier, MD Chief Resident

Education:

Undergraduate:
University of California, Davis
Medical School:
University of California, Davis

Next Step:

University of Utah Hand Fellowship

Career Objective:

Return to Sacramento Area. Upper extremity and general orthopedic practice.

Spouse:

Kelsey Fischer

Personal Statement:

It has been amazing journey through my Davis Life. What it has lacked for in distance traveled it has more than made up for in transformative experiences. I am honored to join the alumni of this department and will carry that distinction with humility and resolve. I want to thank the attendings whose voices will live in my head throughout my career, my inspiring co-residents and friends, the patients who gave me their trust, and my family who have tirelessly supported me. Most of all, I want to thank my wife, whose devotion to me and our partnership I will spend the rest of my life trying to prove I deserve.

Development of a Novel Humerus Fracture Brace with Auto-Adjusting Circumferential Pressure

Patrick Michelier, MD, Colin Jeong, BS, Nick Cusato, BS, Everardo Hernandez, BS, Kevin Alonso, BS, Jorge Zepada, BS, Carlos Benavides, BS, Christopher Bachman, PhD.

Purpose:

A prototype for a humerus fracture (Sarmiento type) brace was developed to ease patient use and limit discomfort in treating humeral shaft fractures. A novel self-adjusting tensioning system was used to accommodate changes in arm circumference as swelling diminishes during the fracture healing process. Non-operative treatment of humerus fractures, despite long history of successful treatment, has diminished over time. The goal of this project is to help eliminate one barrier to non-operative treatment.

Methods:

Used design principle of hoop stress around a thin walled cylinder to model a self-adjusting brace. The spring design with a crank spool decreases the applied force as the radius decreases (as force requirements decrease). A force sensitive resistor (FSR) was used to validate changes in pressure with changes in radius. Used FSR to also measure tolerable pressures on live subjects and compared this to pressure needed at the fracture site of a humerus fracture model to hold a reduction from >30 deg varus deformity to <10 deg.

Results:

Were able to create a prototype that adjusted pressure automatically with different circumferences. Tolerable pressure by both test subjects and that measured in a fracture model were ~4 psi. With current design and necessary brace length, would need a spring constant of 50 lbf/in. Spring displacement is limited by the size of the brace.

Conclusion:

The concept of the self adjusting brace works. The necessary pressure of ~4 psi compares to the measures tolerated by subjects and what is needed to hold a fracture reduction within tolerable limits. The limits to the construct are the spring constant and the spring displacement in the confines of necessary product dimensions. Options for future development include different/additional spring material versus using an electric motor which has unlimited spooling.



Daniel O'Connor, MD

Chief Resident

Education:

Undergraduate School:
University of California Berkeley
Medical School:
University of California Davis

Next Step:

University of Chicago Adult Joint Reconstruction Fellowship

Career Objective:

To be an excellent husband, father and surgeon

Spouse:

Rebecca O'Connor

Children:

Rachel (5yrs)
Caleb (1yr)

Personal Statement:

First and foremost, I thank my wonderful wife Rebecca for her unwavering love, support and compassion through the long hours, stress and delayed gratification that is medical school and surgical training. I could never have done this without her. She has been an incredible inspiration of grace and kindness. I also want to thank her for the amazing gift of our two children, who are such an incredible blessing and delight. I thank my parents and family for their support, love and encouragement along this journey. Thank you to the Attendings who took the time to share their expertise, skill, patience and patients to help me along the path of becoming an orthopedic surgeon. Thank you to my co-residents for your friendship, support, commiseration and fun during our training.

Opioid Use in Revision Total Knee Arthroplasty

Daniel O'Connor MD, Chris Holland MD, John Meehan MD, Zachery Lum DO

Background:

Opioid use after revision total knee arthroplasty (rTKA) has not been well characterized. The purpose of our study was to characterize preoperative, perioperative and postoperative opioid use during rTKA.

Methods:

Patients who underwent rTKA at our institution from 2010 to 2018 were identified via CPT code in the institutional electronic health record (EHR). Patients were evaluated for opioid use 90 days prior to revision surgery and up to 2 years postoperatively by recorded prescriptions in the EHR. Opioid prescriptions were reported as oral morphine milligram equivalents (MME) at specific intervals: 3 months preoperatively and 3, 6, 12 and 24 months postoperatively. Patients were considered tolerant if they had a narcotic prescription preoperatively. Demographics were recorded and compared. Opioid prescriptions and average MME were compared between the two groups.

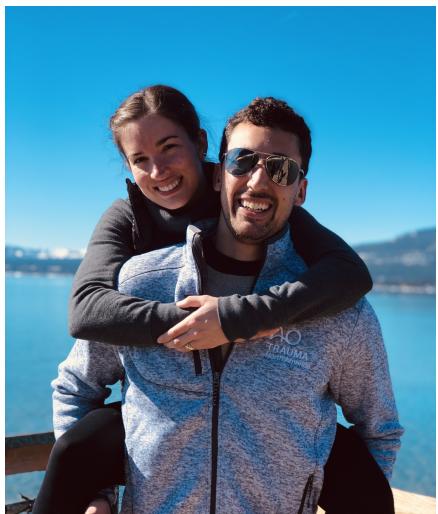
Results:

91 of 173 (53%) patients were in the tolerant group with average preoperative MME of 23.5mg/day. Patient age, surgery time, BMI, diabetes, and functional status were not significantly different between naïve and tolerant groups. Postoperatively, tolerant patients received significantly higher daily MME at 3 months 21.6 vs 31.2 mg/day($p < 0.01$) and 6 months 4.9 vs 11.9 mg/day($p < 0.0019$) and were more likely to have an opioid prescription at 6 months; 37% vs 17%($p < 0.002$) and 12 months 36.3% vs 23.2%($p < 0.04$). The opioid tolerant group had significantly longer postoperative length of stay, 4.82 vs 3.78 days ($p < 0.004$), and were more likely discharged to a skilled nursing facility 40.7% vs 18.3%($p < 0.0040$) than the naïve group.

Discussion:

Patients who had been prescribed opioids preoperatively had significantly higher postoperative MME requirements in the first 6 months after surgery

and were more likely to require an opioid prescription at 6 and 12 months. Opioid tolerant patients had significantly longer length of stay and were less likely to be discharged home.



Augustine Saiz, MD, MS

Chief Resident

Education:

Undergraduate School:
University of Wisconsin, Eau Claire
Medical School:
University of Wisconsin School of Medicine and Public Health

Next Step:

Orthopedic Trauma Fellowship at University of Texas Health Science Center at Houston

Career Objective:

Continue my orthopaedic trauma career as a clinician-scientist at a Level 1 academic trauma center with the goal of providing excellent clinical care for every patient, every time and striving to propel the field of orthopaedic traumatology through research endeavors.

Spouse:

Allison Saiz, MD, MS

Personal Statement:

I cannot adequately express my gratitude for the privilege of my residency training through the UCD Department of Orthopaedic Surgery. The breadth of knowledge and support from the faculty has been beyond outstanding. More importantly, here was a program where my passion for a shared calling was cultivated and refined. I made the decision early to fully lean into residency and found positive feedback and encouragement that continued to invigorate me. Orthopaedic surgery residency training is challenging everywhere but especially at a program such as UCD where the standard of excellence is coupled with a clinically busy environment. The early mornings, the long nights, the intense pace, the high case volumes, the constant educational demands, the persistent pursuit of perfection, the sacrifices made to friends, family, and yourself – in short, the challenges – that's where the beauty is and where the growth happens. That's what I leaned into. There is this concept of deliberate practice and expertise.

Masters of their craft don't tend to always enjoy the practice/training required nor the constant grind, but they rise and overcome these challenges to become preeminent performers because that becomes their identity. They don't see what they do as a job or work but a part of who they are. I have discovered this during residency for myself and for the benefit of my future patients (trauma can happen to anyone, anywhere, at any time). However, that self-determination is easier to generate when you're surrounded by people who are also seeking the same. For that I thank my prior resident/fellow role models, the faculty who mentored this pursuit of expertise, and my current co-residents who through their own hard work pushed me to carry on. To this end, as with any accomplishment, I must thank my parents, Augustine Sr and Pamela, for instilling early values that have continued to be a personal foundation of life. To my sisters, Kathryn and Emma, thank you for endearing siblinghood that has continued to beautifully evolve over our lives. Finally, I am forever indebted to my wife Allison. She continues her own same pursuit of expertise and excellence. Her untiring dedication and passioned drive for excellence serves as a constant source of inspiration. As we continue bonding through this relentless journey towards self-actualization as the best surgeons we can be, in the face of shared sacrifices our relationship perpetually shines as a reservoir of emotional strength and love. With all that said, I confidently feel I leave UC Davis having put everything I could into the program and having been rewarded with world-class training that will be a constant source of pride and foundation for future successes.

Unexpected Return to the OR in Orthopaedic Trauma Fracture Surgery

Augustine M Saiz, Max Ryan Haffner, Kelsey Hideshima, Makenna Rice, Julia Goupil, Wyatt D VanderVoort, Connor M Delman, Jericho A Hallare, Heejung Bang, Justin Choi, Alvin Shieh, Adam Bacon, AmanArora, Satninderdeep Bhatti, Jonathan G Eastman, Barton L Wise, Mark A Lee

Purpose:

Determine the prevalence and cause of unexpected return to the operating room (UROR) in adult orthopaedic trauma patients and identify associated risk factors.

Methods:

A mixed retrospective-prospective review of all adult orthopaedic trauma patients from 2014 - 2019 at a Level 1 academic hospital treated by fellowship-trained orthopaedic traumatologists was performed. An UROR was defined as IAO. If a secondary procedure was considered necessary as part of the expected treatment course (e.g., wound closure after fasciotomy), these procedures were not considered an UROR. A full case review of each patient was undertaken to describe patient demographics, clinical course, and, if applicable, context of re-operation. Variables analyzed included age, sex, race, body mass index (BMI), Charleston Comorbidity Index (CCI), American Society of Anesthesiologists score (ASA), Injury Severity Score (ISS), osteoporosis, smoking history, psychiatric history, associated neurovascular injury, ICU status, polyorthopaedic injuries, compartment syndrome, planned staged procedure, emergent surgery, fracture complexity (based on fracture location/AO classification), open fracture, periprosthetic fracture, and timing of surgery. Univariate and multivariate logistic regression was performed to calculate odds ratios comparing those patients with an UROR versus those without.

Results:

A total of 1286 patients were identified and reviewed. There was a total of 126 patients with an UROR for a prevalence of 9.8%. Of those patients, symptomatic implant was the leading cause of UROR accounting for 60% of cases. Other significant UROR causes were infection (15%), instability/technical error (10%), and implant failure (9%). The median time between index procedure and UROR was 301 days 1113<1(115 - 890 IQR).

For the univariate analysis, planned staged procedure (OR 1.83, 95% CI 1.02 - 3.30, p < 0.05), open fracture (OR 1.21, 95% CI 1.04 - 2.12, p < 0.05), fracture complexity (OR 1.83, 95% CI 1.11 - 3.03, p < 0.01), and weekend procedure (OR 1.79, 95% CI 1.16 - 2.76, p < 0.01) were all associated with increased risk of UROR. All other variables were not statistically significant for any associations.

For the multivariate analysis, planned staged procedure (OR 2.0, 95% CI 1.06 - 3.78, p < 0.05), open fracture (OR 1.34, 95% CI 1.26 - 2.22, p < 0.05),

fracture complexity (OR 1.56, 95% CI 1.33 – 3.15, p < 0.01), and weekend procedure (OR 1.85, 95% CI 1.16 - 2.94, p < 0.01) continued to be associated with increased likelihood of UROR.

Those patients with an UROR for reasons other than symptomatic implants were more likely to have polyorthopaedic injuries (OR 1.38, 95% CI 1.10 - 2.08, p < 0.05), ISS > 15 (OR 2.97, 95% CI 1.10 - 2.08, p < 0.05), ISS > 15 (OR 2.97, 95% CI 1.32 - 6.72, p < 0.05), osteoporosis (OR 2.72, 95% CI 1.30 - 5.69, p < 0.01), ICU status (OR 2.2, 95% CI 1.28 - 3.80, p < 0.05), psychiatric history (OR 2.08, 95% CI 1.12 - 3.87, p < 0.05), compartment syndrome (OR 4.44, 95% CI 1.12 - 17.5, p < 0.05), neurovascular injury (OR 3.02, 95% CI 1.22 - 7.5, p < 0.01), open fracture (OR 2.36, 95% CI 1.29 - 4.34, p < 0.05), and fracture complexity (OR 3.04, 95% CI 1.87 – 4.48, p < 0.05).

Conclusion:

The rate of UROR in the orthopaedic trauma patient population is high at nearly 10%. Most of these cases though are due to implant-related issues. As such, typically UROR events occur about 1 year out from surgery. However, regarding UROR for reasons other than symptomatic implants, these patients tend to be polytraumatized having sustained higher-energy injuries with resulting multiple complex fractures and associated surrounding tissue injuries. Future focus on improved implant development along with improved treatment algorithms and techniques for polytraumatized patients with complex fractures is warranted to decrease a relatively high UROR rate in orthopaedic trauma.



John C Wuellner, MD Chief Resident

Education:

Undergraduate US Air Force Academy
Medical School:
Uninformed Services University of Health
Sciences F. Edward Hebert School of Medicine

Next Step:

Osan, South Korea...maybe

Career Goals:

To be a knowledgeable, compassionate, skilled surgeon for my future patients.

Significant Other:

Emily Bailey

Dog:

Louise

Personal Statement:

When I first rotated at UC Davis in 2013 I made it my life's mission to make it back when I was able to apply. I had become smitten with the program. It is surreal to be at this point in my training looking back to those early days with how rare the possibility of making it back seemed to be. I am grateful and forever indebted to the staff and residents that have guided me along this journey. Most importantly, I thank Emily and my family for supporting me in this endeavor and being forever understanding.

Video Fluoroscopic Swallow Analysis of Patients Undergoing Anterior Cervical Spine Surgery

John Wuellner MD, Thomas Shen BS, Hai Le MD, Yashar Javidan MD, Peter Belafsky MD PhD, Eric Klineberg MD

Introduction:

The most common complication after anterior cervical spine (ACS) surgery is dysphagia. It may result from pharyngeal edema, structural changes, or nerve injury, which can impair vocal fold mobility, pharyngeal sensation, or pharyngeal function. We report the changes in swallowing parameters seen after undergoing ACS.

Methods:

A case series of patients anticipated to undergo ACS were referred to an otolaryngologist at a single center for dysphagia evaluation between 6/2020 and 6/2021. Parameters from video fluoroscopic swallow studies including lateral upper esophageal sphincter opening (UES-L) and pharyngeal constriction ratio (PCR) were measured preoperatively and again postoperatively. Multi-level versus single level procedures, primary versus revision surgery, and perioperative use of steroids was abstracted.

Results:

36 patients anticipated to undergo ACS were identified and underwent pre and post operative video fluoroscopic swallow study (VFSS) with 16 completing the studies. Mean age was 56 (+/- 10 years) and 47% were female. 75% (12/16) were multi-level surgeries. 6.3% (1/16) were revision surgeries. 25% (4/16) received perioperative steroids. There was no significant difference in PCR for ACS patients preoperatively (0.05 (+/- 0.02)) vs. postoperatively (0.05 (+/- 0.03))(p=0.63)). There was no difference in mean lateral UES-L opening preoperatively (0.83 (+/- 0.21) vs. postoperatively 0.97 (+/- 0.22)) (p = 0.34) although this approached significance.

Discussion and Conclusion:

Swallowing dysfunction after ACS has previously been shown to be related to PCR. In this study we lack sufficient power to show a change perioperatively, a protective effect of perioperative steroid use, or a difference between multi-level vs. single level procedures. Further analysis is warranted.



Max Haffner, MD, MS

2020-2021 Dickenson Research Resident

Education:

Undergraduate School: University of California San Francisco

Medical School:

University of California, Davis School of Medicine

Gender and Ethnic Diversity in Orthopaedic Residency in Comparison to Other Surgical Specialties

Max Haffner, MD, Benjamin W. Van, BS, Joseph B. Wick, MD, Hai V. Le, MD

Background:

Orthopaedic surgery training programs have lagged behind other surgical specialties in increasing their representation of women and people from underrepresented minority (URM) groups. Comparative data between orthopaedic surgery and other specialties is needed to help identify solutions to closing the diversity gap that exists.

Methods:

This was a retrospective evaluation of a large, longitudinally maintained survey database. Resident data by gender and ethnicity were retrieved from the Accreditation Council for Graduate Medical Education Data Resource Books for the 2011 to 2012 through 2019 to 2020 academic years. The Accreditation Council for Graduate Medical Education database is updated annually; thus, it is the most up-to-date and complete database available for gender and ethnicity data for all surgical residents. Data were obtained and analyzed for seven different surgical specialties: orthopaedic surgery, neurosurgery, ophthalmology, otolaryngology, plastic surgery, general surgery, and urology. No sampling was necessary and thus descriptive statistics of the data were completed. Due to the entire population of residents being included for the period of time in question, no statistical

comparisons were made, and the reported differences represent absolute differences between the groups for these periods. Linear regression analyses were performed to estimate the annual growth rates of women residents and residents from URM groups in each specialty.

Results:

Among the seven surgical specialties, representation of women residents increased from 28% (4640 of 16,854) in 2012 to 33% (6879 of 20,788) in 2020. Orthopaedic surgery had the lowest representation of women residents every year, with women residents comprising 16% of residents (700 of 4342) in 2020. Among the seven surgical specialties, representation of residents from URM groups increased from 8.1% (1362 of 16,854) in 2012 to 9.7% (2013 of 20,788) in 2020. In 2020, the representation of residents from URM groups in orthopaedic surgery was 7.7% (333 of 4342). In 2020, general surgery had the highest representation of women residents (42%; 3696 of 8809) as well as residents from URM groups (12%; 1065 of 8809). Plastic surgery (1.46% per year) and general surgery (0.95% per year) had larger annual growth rates of women residents than the other specialties did. In each surgical specialty, the annual growth rate of residents from URM groups was insignificant.

Conclusion:

During the past decade, there was only a small increase in the representation of women in orthopaedic surgery, while the representation of people from URM groups did not change. In contrast, by 2020, general surgery had become the most diverse among the seven surgical specialties. To increase diversity in our field, we need to evaluate and implement some of the effective interventions that have helped general surgery become the diverse surgical specialty that it is today.

**William Ip, MD****PGY-2 Resident**

Research Project Title: PROMIS scores in children and adolescents undergoing ACL reconstruction

Project Overview: My project looks over how PROMIS scores change pre surgery then looking how the scores trend at different time intervals after surgery.

**Judas Kelley, MD****PGY-2 Resident**

Research Project Title: 3D Mapping of Periprosthetic Distal Femur Fractures

Project Overview: Periprosthetic distal femur fractures have become more common and are challenging due to a lack of recognizable fracture patterns. We intend to use CT imaging to 3D map native and periprosthetic distal femur fractures in order to improve our understanding and successful treatment of these challenging fractures.

**Edmond O'Donnell, MD****PGY-2 Resident**

Research Project Title: Role of cancer stem cells in the development of drug-resistance in soft tissue sarcoma

Project Overview: Sarcomas are a rare and difficult to treat form of cancer affecting the connective tissues of the body, including muscle and bone. Lack of effective treatment options for sarcomas is an ongoing clinical problem. Cancer stem cells are a unique population of cells with the ability to re-populate cancers after treatment with chemotherapeutic agents, and exist in a protective state within cancers. Eradication of cancer stem cells presents a unique opportunity to potentially obtain more definitive treatments for cancer. However, the role of cancer stem cells including how they facilitate resistance is an active area of research. We have used next-generation sequencing to characterize differences in expression of genes in "normal" and "stem cell" populations in several soft tissue sarcoma cell culture models. Certain genes are expressed differently in stem cells, and represent potential targets for chemotherapeutic agents. By generating artificial tumors in mice using our sarcoma cell culture models, we will investigate specific genes identified in our sequencing screen to study cancer stem cells in sarcomas by studying their effect on tumor growth and drug resistance.

**Wyatt Vander Voort, MD****PGY-2 Resident**

Research Project Title: The Impact of Sarcopenia in Geriatric Hip Fracture Patients

Project Overview: Sarcopenia is a clinical syndrome of diminished muscle mass and function associated with disability, poor surgical outcomes, and mortality. Within orthopaedics, a femoral neck fracture has been shown to have an estimated mortality rate of 20% or more at one year after injury, and estimates regarding loss of independence are at 50%. A diagnosis of sarcopenia can be quickly made by measuring psoas index and psoas density values from preoperative computed tomography (CT) scans. We aim to determine if sarcopenia diagnosed by CT scan at the time of presentation is associated with poor outcomes within this patient population.

**Terri Zachos, MD, PhD, DVM****PGY-2 Resident**

Research Project Title: Efficacy of Open, Continuous Suture Technique in Microsurgical End to Side Anastomoses

Project Overview: Traditional microsurgical anastomoses are performed with interrupted 8-0, 9-0, 10-0, and occasionally 11-0 nylon sutures under 10-40 power magnification. Achieving consistent anastomotic patency requires atraumatic tissue handling, good visualization of each suture bite, and accurate suture placement. The interrupted technique achieves these goals but requires tying multiple microsurgical knots and is very time consuming. A continuous suture technique that allows for consistent anastomotic patency would significantly reduce anastomotic time, tissue ischemic times, and surgeon fatigue. An open, continuous suture microsurgical suture technique results in 1) equivalent anastomotic quality (as measured by lumen diameter and load to failure strength) and 2) can be accomplished in half the time as compared to an interrupted technique. We propose an in vivo rat model for evaluation of an open continuous (end to side) anastomosis technique.



Department of
Orthopaedic Surgery

