



The Paul R. Lipcomb Alumni Society Presents:

UC DAVIS
HEALTH

Department of
Orthopaedic Surgery

Department of Orthopaedic Surgery Graduate
Research Symposium

Friday, June 14, 2019

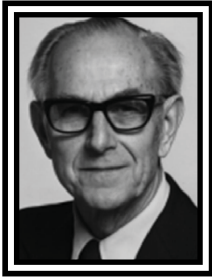


**WELCOME TO THE 2019
PAUL R. LIPSCOMB
ALUMNI SOCIETY
GRADUATE RESEARCH
SYMPOSIUM**

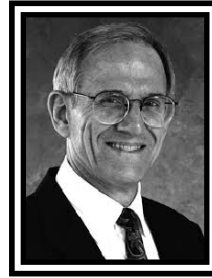
This outstanding gathering is an opportunity for our department to highlight scientific as well as clinical research, and to reconnect with clinical faculty and alumni who have served our department over the years. Our special guests this year are: Nobel Laureate, Mario Capecchi, Ph.D., Professor of School of Biological Sciences and Human Genetics at University of Utah and Investigator of the Howard Hughes Institute; and Thomas Vail, M.D., Chair of Orthopaedic Surgery at University of California, San Francisco.

Most importantly, this is an occasion to commemorate the graduation of six 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.

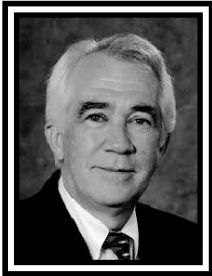
ORTHOPAEDIC SURGERY CHAIRS



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



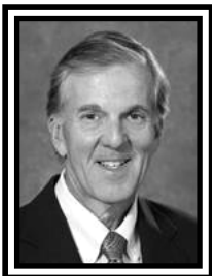
*Michael W. Chapman, M.D.
Professor Emeritus
Chair 1979-1999*



*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*

VISITING PROFESSORS

- 1982 – Robert B. Winter, M.D.
1983 – Anthony Catterall, M.D.
1984 – Eugene E. Bleck, M.D.
1985 – Paul P. Griffin, M.D.
1986 – M. Mark Hoffer, M.D.
1987 – Robert B. Salter, M.D.
1988 – Colin F. Moseley, M.D.
1989 – James R. Gage, M.D.
1990 – James F. Kellman, M.D.
1991 – David S. Bradford, M.D.
1992 – Adrian E. Flatt, M.D.
1993 – Augusto Sarmiento, M.D.
1994 – M. Mark Hoffer, M.D.
1995 – James R. Andrews, M.D.
1996 – James R. Urbaniak, M.D.
1997 – Stuart L. Winstein, M.D.
1998 – Robert A. Mann, M.D.
1999 – Joseph M. Lane, M.D.
2000 – Andrew J. Weiland, M.D.
2001 – Joel M. Matta, M.D.
2002 – Terry R. Trammell, M.D.
2003 – Kaye E. Wilkins, M.D.
2004 – Richard Gelberman, M.D.
2005 – Robert H. Hensinger, M.D.
2006 – James Heckman, M.D.
2007 – Thomas A. Einhorn, M.D.
2008 – Joseph A. Buckwalter, M.D.
2009 – Peter J. Stern, M.D.
2010 – Joseph Borrelli, Jr., M.D.
2011 – Keith Bridwell, M.D.
2012 – Gary C. Poehling, M.D.
2013 – Robert Anderson, M.D.
2014 – Jeffrey Eckardt, M.D.
2015 – J. Tracy Watson, M.D.
2015 – Matthew L. Warman, M.D.

VISITING PROFESSORS

2016 — Stuart B. Goodman, M.D.

2016 — Cosimo De Bari, Ph.D.

2017— Frank P. Luyten, M.D., Ph.D.

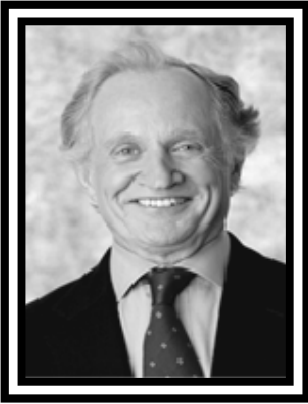
2017— Marc J. Philippon, M.D.

2018 — Michael W. Chapman, M.D.

2018 — Joseph A. Buckwalter, M.D.

2019 — Nobel Laureate, Mario R Capecchi, Ph.D.

2019 — Thomas P. Vail, M.D.



**NOBEL LAUREATE,
MARIO CAPECCHI,
P.H.D.**

**Distinguished Professor of School of Biological Sciences and Human Genetics
University of Utah
Investigator of the Howard Hughes Institute**

Mario Capecchi was born in Verona, Italy. He received his B.S. degree in chemistry and physics from Antioch College and his Ph.D. degree in biophysics from Harvard University and advanced to Associate Professor. He then joined the faculty at the University of Utah as a Professor of Biology. Dr. Capecchi has been an investigator of the Howard Hughes Medical Institute, a Professor of Human Genetics at the University of Utah School of Medicine and Distinguished Professor of Human Genetics and Biology. He is also co-chairman of the Department of Human Genetics.

Dr. Capecchi is best known for his pioneering work on the development of gene targeting in mouse embryo-derived stem (ES) cells. He was awarded the Nobel Prize in Physiology and Medicine in 2007 with Oliver Smithies and Martin Evans along with many additional awards. His research interests include: the molecular genetic analysis of early mouse development, neural development in mammals, production of murine models of human genetic diseases, gene therapy, homologous recombination and programmed genomic rearrangements in the mouse.



THOMAS VAIL, M.D.

**Chair of Orthopaedic Surgery
University of California, San Francisco**

Dr. Thomas Parker Vail, Chair of Orthopaedic Surgery at University of California San Francisco, is a specialist in total joint replacement and preservation of the hip and knee, as well as surgical treatment of arthritis and osteonecrosis (a bone disease in which tissue dies from lack of blood supply.) After 20 successful years at Duke University, he came to UCSF to help build the new Orthopaedic Institute at Mission Bay. He oversees the department's activities in patient care, research and education. In his research, Vail investigates innovative bone implant techniques. He also studies clinical outcomes of devices used in reconstruction and repair of cartilage in adult patients.

After graduating from Duke University with a degree in mechanical engineering and materials science, Vail earned his medical degree at the Loyola University Chicago Stritch School of Medicine. He completed a residency in orthopedic surgery at Duke University Medical Center, then went on to complete a fellowship in adult reconstructive surgery.

Vail is a past president of the American Association of Hip and Knee Surgeons.

FACULTY:

UNIVERSITY OF CALIFORNIA, DAVIS HEALTH SYSTEM

Robert H. Allen, M.D.

Professor, Hand, Upper Extremity, and Microvascular Surgery

Christopher O. Bayne, M.D.

Assistant Professor, Hand, Upper Extremity, and Microvascular Surgery

Blaine A. Christiansen, Ph.D.

Associate Professor, Orthopaedic Research Laboratory

Jonathan G. Eastman, M.D.

Associate Professor, Trauma Service

Ellen P. Fitzpatrick, M.D.

Assistant Professor, Trauma Service

David P. Fyhrie, Ph.D.

Professor, Orthopaedic Research Laboratory

Mauro Giordani, M.D.

Professor and Chief of Adult Reconstructive Service

Eric Giza, M.D.

Professor, Chief of Foot and Ankle Service

Dominik R. Haudenschild, Ph.D.

Professor, Orthopaedic Research Laboratory

Brian M. Haus, M.D.

Assistant Professor, Pediatric Orthopaedic Service

Maury L. Hull, Ph.D.

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

Yashar Javidan, M.D.

Assistant Professor, Adult and Pediatric Spine Service

Eric O. Klineberg, M.D.

Professor, Adult and Pediatric Spine Service

Christopher D. Kreulen, M.D.

Assistant Professor, Foot and Ankle Service

J. Kent Leach, Ph.D.

Professor, Orthopaedic Research Laboratory, and Biomedical Engineering

Cassandra A. Lee, M.D.

Associate Professor, Sports Medicine Service

Mark A. Lee, M.D.

Professor, Trauma Service

Holly B. Leshikar, M.D.

Assistant Professor, Pediatric Orthopaedic Service

Richard A. Marder, M.D.

Professor, Chief of Sports Medicine Service

Sean M. McNary, Ph.D.

Assistant Adjunct Professor, Orthopaedic Research Laboratory

John P. Meehan, M.D.

Professor, Adult Reconstructive Service

Gavin C.T. Pereira, M.B.B.S., F.R.C.S.

Associate Professor, Adult Reconstructive Service

R. Lor Randall, M.D., FACS

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

A. Hari Reddi, Ph.D.

Professor, Orthopaedic Research Laboratory

Rolando F. Roberto, M.D.

Professor, Chief of Adult and Pediatric Spine Service

Robert M. Szabo, M.D., M.P.H.

Professor, Chief of Hand, Upper Extremity, and Microvascular Surgery

Steven W. Thorpe, M.D.

Assistant Professor, Chief of Orthopaedic Oncology

James M. Van Den Bogarde, M.D.

Associate Professor, Sports Medicine Service

Barton L. Wise, M.D.

Associate Professor, Orthopaedic Research Laboratory, and Internal Medicine

Philip R. Wolinsky, M.D.

Professor, Chief of 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

FRIDAY JUNE 14, 2019

- 7:00 AM **Continental Breakfast**
- 7:30 AM **Welcome – Department Chair, Dr. R. Lor Randall, M.D, FACS**
- 7:35 AM **Introduction of Guest Speaker (Clinical Science): Dr. R Lor Randall, M.D, FACS**
- 7:40 - 8:40 AM **VISITING PROFESSOR (CLINICAL): Dr. Thomas Vail, M.D, Professor and Orthopaedic Surgery Department Chair, UCSF**
“Osteonecrosis of the Hip: The Cells are not Talking!”

CHIEF PRESENTATIONS MODERATOR: MARK LEE, M.D.

- 8:45 - 9:00 AM **CHIEF RESIDENT: Jacob Carl, M.D.**
“Postoperative Oral Antibiotics in Outpatient Foot and Ankle Surgery: Are We Affecting Postoperative Infections or Wound Healing Complications?”
- 9:00 - 9:15 AM **CHIEF RESIDENT: Jacob Fennessy, M.D.**
“The Utility of MRI for Detecting Unstable Cervical Spine Injuries in the Neurologically Intact Traumatized Patient Following Negative CT Imaging”
- 9:15 - 9:30 AM **CHIEF RESIDENT: Nasser Heyrani, M.D.**
“The Effect of Radioscapholunate Fusion With and Without Distal Scaphoid and Triquetrum Excision on Capitolunate Contact Pressures”
- 9:30 - 9:45 AM **CHIEF RESIDENT: Andrew Meyers, M.D.**
The Contribution of Anterior L5/S1 Lumbar Interbody Fusion to Spinopelvic Parameters and Fusion Rate in the Setting of Adult Degenerative Scoliosis”
- 9:45 - 10:00 AM **CHIEF RESIDENT: Ruwan Ratnayake, MD**
“Risk Factors Associated with Dysphagia/Dysphonia After Anterior Cervical Spine Surgery”

- 10:00 - 10:45 AM **Break / Department Photos**
- 10:50 - 11:05 AM **2018-2019 DICKENSON RESEARCH RESIDENT: Donald Kephart, M.D.**
"Skeletal Age Assessment using the Calcaneal Staging System in Ambulatory Children with Cerebral Palsy."
- 11:05 - 11:10 AM **Introduction of Guest Speaker (Basic Science): Department Chair, Dr. R Lor Randall, M.D., FACS**
- 11:10 - 12:10 PM **VISITING PROFESSOR (BASIC SCIENCE): Nobel Laureate, Dr. Mario Capecchi, Ph.D., University of Utah**
"The Birth of Gene Targeting in the Mouse"
- 12:10 - 12:45PM **Lunch**
- PGY-2 PRESENTATIONS MODERATOR: BARTON WISE, M.D.**
- 12:50 - 1:00 PM **PGY-2 RESIDENT: Christopher Holland, M.D.**
"EASTT Trial: Enhanced Recovery after Surgery Protocol in Arthroplasty Surgery for TKA and THA"
- 1:00 - 1:10 PM **PGY-2 RESIDENT: Zachary Hill, M.D.**
"Does the Use of Video Based Platforms for Common Post-Operative Issues Decrease Clinic Burden and Lead to Improved Clinical Care? A Randomized Prospective Study"
- 1:10 - 1:20 PM **PGY-2 RESIDENT: Connor Delman, M.D.**
"Enhanced Recover After Surgery – Spine Surgery"
- 1:20 - 1:30 PM **PGY-2 RESIDENT: James Reynolds, M.D.**
"Adolescent Idiopathic Scoliosis Patients with Pain Have Both Lower Pre- and Post-operative PROMIS Outcome Scores"
- 1:30 - 1:40 PM **PGY-2 RESIDENT: Marcus Shelby, M.D.**
"Management of Severe Equinus Deformity in Children with Cerebral Palsy"
- 1:45 - 2:15 PM **Town vs. Gown Discussion**
- 2:15PM **Adjournment**



JACOB R. CARL M.D.

Education:

University of California, San Diego

B.S. Human Biology (2009)

State University of New York Downstate Medical Center

College of Medicine

M.D. (2014)

Next Step:

Cincinnati Children's Hospital: Pediatric Orthopaedic

Fellowship

Career Objective:

Provide comprehensive, compassionate orthopaedic care to children of all ages

Significant Other/Children:

Quinn Williams

PERSONAL STATEMENT

Orthopaedic residency has been one of the most challenging and rewarding experiences of my life. It has been a time of intense learning, physical stress and high pressure situations. These experiences have created incredible bonds, great stories, and fond memories that I wouldn't trade for anything. I am truly proud to be a product of the UC Davis Orthopaedic legacy.

I want to thank my family, friends, co-residents and faculty. Thank you all for your support and sacrifices over the years. To my beautiful girlfriend, Quinn, thank you for the unwavering

Support, patience, and love. To my parents, you've been there since day one and have always believed in me. Thank you for everything you have done for me.

For my classmates and co-residents, no matter what, do not lose sight of the ultimate mission of caring for our patients in a humanistic way. Please don't forget to have a little fun along the way. I know the program is in excellent hands and I am excited to see where this new chapter leads.

Title: Postoperative Oral Antibiotics in Outpatient Foot and Ankle Surgery: Are We Affecting Postoperative Infections or Wound Healing Complications?

Introduction: Perioperative antibiotics use in foot and ankle surgery is a topic that has often been discussed yet there remains considerable controversy. We sought to identify any difference in postoperative infection rate or wound healing complications in patients who received postoperative oral antibiotics versus those that did not. Additionally, we sought to identify patient characteristics associated with postoperative infections or wound complications.

Methods: Retrospective chart review of 649 patient charts undergoing outpatient foot and ankle surgery over a 2-year period performed by two foot and ankle fellowship trained surgeons at an ambulatory surgery center. All cases were included with at least one follow-up visit and no evidence of chronic wounds or infection. Patients that received postoperative oral antibiotics (PAB) and those that did not receive postoperative oral antibiotics (NAB) were evaluated to identify whether a difference in infection rate or wound healing complication were present. Patient demographics, medical comorbidities, BMI, smoking status, and tourniquet time were analyzed to identify contributing factors or comorbidities that may be more prevalent in each group.

Results: : The number of deep versus superficial infections and wound complications between the two groups was not statistically significant. Patients that developed infections versus those that did not were older (average age 55 vs. 45), demonstrated a higher prevalence of hypertension (44% vs. 17%), and a history of neoplasm (19% vs. 2%). No significant difference was found between groups based on BMI, diabetes, tourniquet time, or smoking status

Discussion and Conclusion: We found no benefit to prescribing postoperative oral antibiotics in an outpatient foot

and ankle surgery setting. Additionally, older patients, patients with hypertension, and patients with a history of neoplasm made up a larger percentage of patients developing postoperative infections. BMI, diabetes, tourniquet time and smoking status did not have a significant difference in postoperative infections between groups.



JACOB H. FENNESSY, M.D.

Education:

University of California, Santa Barbara
B.S. Biochemistry (2006)
M.S. Physiology and Biophysics (2009)
Georgetown University,
MD. (2014)

Next Step:

University of California, San Diego, Orthopaedic Spine Surgery
Fellowship, 2019-2020

Career Objective:

Where I see myself at 5 and 10 years from now is taking care of patients with spine pathology in a multidisciplinary academic practice. I wouldn't be in the position of success that I am in now if it weren't for mentors and educators directing me, teaching me, and inspiring me. If possible, I hope to remain an academic surgeon to continue this necessity of mentorship in the field of orthopaedic surgery, and play a role in the advancement of techniques, resident surgeon training, and longitudinal spine care.

Significant Other/Children:

Spouse: Kimberly Fennessy
Children: Blythe Fennessy

PERSONAL STATEMENT

My path to medicine was somewhat non-traditional, and my path to orthopedic surgery was rather serendipitous: A random summer internship with a group of spine surgeons in

Philadelphia in an attempt to stay busy between my first and second year of medical school. Orthopedics, and even more specifically, spine surgery, was a calling for me, and I have never looked back. Today I stand in a position that felt nearly unattainable 9 years ago; and not just in my career, but in the grand scheme of life as well. My success as a professional, and more importantly, as a husband and a father, are a result of the unconditional devotion of my family, especially my wife, Kim. Thank you.

I have learned that the decision to be a doctor and a surgeon is an obligation to a life of service and sacrifice beyond my original understanding. The process of residency and training to be a surgeon has taught me nearly everything I could possibly need to know about orthopedics, but more importantly, has taught me the true meaning of sacrifice. Not the sacrifice that I chose, but the sacrifice that my family accepts, and the amount of love and devotion it requires to support such a decision, every single day. I am humbled, and grateful for the mentorship and training from the faculty of UC Davis Orthopaedics, I am forever in your debt. More importantly, to my wife and daughter, thank you for your sacrifice, your encouragement, and your unwavering support.

Title: The Utility of MRI for Detecting Unstable Cervical Spine Injuries in the Neurologically Intact Traumatized Patient Following Negative CT Imaging

Authors: Jacob Fennessy, M.D, M.S.; Joseph Wick, M.D.; Fiona Scott, M.D., M.P.H.; Rolando Roberto, M.D.; Yashar Javidan, M.D.; Eric Klineberg, M.D., M.S.

Background context: Neurologically intact blunt trauma patients with persistent neck pain and negative CT imaging frequently undergo MRI for evaluation of occult cervical spine injury. There is a paucity of data to support or refute this practice.

Purpose: To evaluate the utility of cervical spine MRI in neurologically intact blunt trauma patients with negative CT imaging.

Design: Retrospective cohort

Patient sample: All neurologically intact blunt trauma patients presenting to a level 1 trauma center from 2005-2015 with persistent neck pain and negative CT imaging.

Outcome measures: The proportion of patients with positive

MRI findings, subsequent treatment, and time required to obtain MRI results.

Methods: Consecutive blunt trauma patients undergoing CT and MRI were identified by CPT codes. Data on imaging results, treatment outcomes, and time required to obtain imaging studies was extracted from the electronic medical record.

Results: Of the 223 patients meeting inclusion criteria, 11 had positive MRI findings; however, n patients were found to have unstable injuries requiring surgical treatment. The process for a complete evaluation of unstable cervical spine injury from the time of obtaining a CT scan was 19 hours and 43 minutes.

Conclusions: Eleven patients had positive MRI findings, yet these findings did not alter treatment. In contrast, the time required to obtain MRI results may substantially delay patient care. Our results demonstrate that MRI has limited utility in neurologically intact blunt trauma patients with negative CT imaging.



NASSER HEYRANI, M.D.

Education:

University of California, Los Angeles
B.S. Psychobiology (2009)
M.D. (2013)

Next Step:

Harvard-MGH Foot & Ankle Fellowship

Career Objective:

Deliver compassionate, safe, and effective care to my patients; with a focus on sporting injuries of the foot and ankle driven by cutting edge translational research

Significant Other/Children:

Spouse: On-Call to OR

Children: On-Call to OR

PERSONAL STATEMENT:

They say it takes a village to raise a child. After six years of residency, I'm certain the same adage applies in training an orthopedic surgeon. Looking back on my time here, it's clear to me it took much more than just hard work and discipline to get here.

I've gained more than I could have ever expected when I arrived at UC Davis as a 4th year medical student. This residency has taught me more than I ever imagined, and has taken me to places I never dreamed, from rural hospitals in Managua to soccer stadiums in Barcelona. The greatest thoughts that come to mind are the lifelong friendships I've forged with my

co-residents, sleepless nights holding “the rock,” weekends in the OR, patients whom I will never forget, and mentors who motivated, challenged, and inspired me daily.

The one thought that has resonated more than any other, is that I didn't walk this long journey alone. I have countless people to thank for their endless support and love, from family and friends, to my mentors, fellow residents, and administrators. I am grateful for all of these phenomenal individuals and my accomplishments are purely a reflection of them. I am looking forward to the next chapter...and the biggest mallet... in Boston. No diggity, Un abrazo, Much love,
Nas

Title: The Effect of Radioscapholunate Fusion With and Without Distal Scaphoid and Triquetrum Excision on Capitulum Contact Pressures

Authors: Nasser Heyrani, M.D.

Sean M. McNary, PhD, Ido Volk, M.D.,* Robert M. Szabo, M.D.,* Christopher O. Bayne, M.D.*

Purpose: To determine the effects of motion-increasing modifications to radioscapholunate (RSL) arthrodesis on capitulum contact pressure in cadaveric wrist specimens.

Methods: Ten fresh-frozen cadaveric wrists were dissected of all superficial soft tissue, potted in poly methyl-methacrylate, and the carpus exposed via a ligament-sparing capsulotomy. An RSL arthrodesis was simulated using 2 2.4-mm distal radius plates with locking screws. The distal scaphoid pole and triquetrum were removed with an osteotome and rongeur, respectively. Contact area, pressure, and force were measured in the capitulum joint during the application of a 35-N uniaxial load using pressure-sensitive film. Measurements were obtained before and after simulated RSL fusion, following distal scaphoidectomy and after triquetrectomy.

Results: The combination of RSL fusion with distal scaphoid excision (DSE) increased contact forces in the capitulum joint by 50% over controls. An RSL fusion, and RSL fusion with DSE and triquetrum excision (TE), exhibited intermediate levels of contact force between controls and RSL fusion with DSE. Capitulum contact pressures were similar between all experimental groups. Contact area in the capitulum joint increased by 43% after RSL fusion with DSE over intact specimen controls.

Lastly, contact area in wrists with RSL fusion, and RSL fusion with DSE and TE, were elevated, but not significantly different from intact controls.

Conclusions: A DSE performed at the time of RSL fusion results in increased midcarpal joint contact force and area, with resultant contact pressures unchanged. Triquetrectomy, which has been previously shown to improve range of motion, did not increase contact forces in the capitolunate joint.

Clinical relevance: If a surgeon is contemplating performing an RSL arthrodesis with DSE, we recommend adding a triquetrectomy to improve motion because this does not add to the potentially deleterious effects of increased midcarpal contact force.



ANDREW J. MEYERS, M.D.

Education:

University of California, Davis

B.S. Biological Sciences (2008)

Georgetown University

M.S. Physiology and Biophysics (2010)

University of California, Davis, School of Medicine

M.D. (2014)

Next Step:

Adult Reconstructive Fellowship at the University of California, Davis Medical Center

Career Objective:

To become an expert in arthroplasty/adult reconstruction and join the clinical ranks here in Sacramento.

Significant Other/Children:

Ines Benavides

Isaac James Benavides Meyers (son, age 3)

Reese Benavides Meyers (daughter/labradoodle, age 7)

PERSONAL STATEMENT:

It is hard to believe, surreal really, that residency is already coming to a close. For as long as I can remember, I have wanted to be a surgeon, and the path to residency was definitely not easy. Now that I have reached this point in my life, it is difficult to contain the tremendous amount of pride and gratitude I possess. The transition from newly minted physician to orthopaedic surgeon is one that is full of emotions: excitement, pride, exhaustion, angst, uncertainty, growth, and hope. These

past five years have arguably been the most challenging ones of my life, but they have also been some of the most exciting and rewarding times as well. In addition to the many clinical milestones I experienced during this phase of training, there were also some major personal developments: my wife and I purchased our first home, we became parents for the first time, we formulated plans for our future, and we made some of the closest and most genuine friends we have ever had. I am truly thankful for this time and all of these experiences!

I would be remiss if I did not take this opportunity to express my gratitude, as I would not be in this position without the tremendous support, guidance, patience, encouragement, trust, and love of others. To my parents: thank you for empowering me to follow my dream and for supporting me through the process. To my colleagues: Thank you for your friendship, hard work, and too many memories to count. To my mentors and faculty: thank you for your patience, guidance, wisdom, and trust; I wouldn't be here without you trusting me with your patients. To Margaret and Maggie: thank you for keeping us on track and for making sure we are taken care of; we truly appreciate your efforts! Lastly, but certainly not least, to my wife, Ines, and son, Isaac: thank you both for living this path with me. Ines, you truly are a saint and you have been my rock through this process; thank you for being an amazing partner, mother, and friend – I could not have done this without you. Isaac, you're too young to understand the sacrifices we have made to get here, but you do know what it's like to miss your daddy and I appreciate your unconditional love; there really is nothing better than that big hug when I get home!

Here's to many more experiences together! I can't wait to see all of the amazing things my colleagues will do and am excited to keep in touch and experience all of the amazing families you continue to build. Much love.

Title: The Contribution of Anterior L5/S1 Lumbar Interbody Fusion to Spinopelvic Parameters and Fusion Rate in the Setting of Adult Degenerative Scoliosis

Background: Fusion of the lumbosacral junction is thought to optimize spinopelvic alignment and health related quality of life measures in the adult degenerative scoliosis patient. This is often accomplished via anterior lumbar interbody fusion

(ALIF) at L5/S1; however, literature that objectively demonstrates the contribution of ALIF at this level is lacking. This retrospective radiographic review is intended to demonstrate the contribution of ALIF at L5/S1 in this clinical setting.

Methods: Individuals who have undergone multi-level (>4 levels) spinal fusion to the pelvis for adult degenerative scoliosis were identified and sorted into three groups: anterior and posterior spinal fusion ("Anterior", n=17), anterior and posterior spinal fusion with anterior L5/S1 interbody graft ("Anterior + ALIF L5/S1", n=13) and posterior spinal fusion only ("Posterior", n=21). Radiographic parameters (thoracic kyphosis (TK), lumbar lordosis (LL), sagittal vertical axis (SVA), pelvic incidence (PI), pelvic tilt (PT), sacral slope (SS), lumbopelvic angle (LPA), and T1-pelvic angle (TPA)), union status, and construct status were assessed. Demographic characteristics, changes from baseline in radiographic parameters, and non-union and rod breakage rates were then compared between groups.

Results: Fifty-one subjects with a mean age of 66.6 years were included, 74.5% of which were female. Baseline characteristics were not significantly different between groups. At 6-12 weeks post-operative: change in TK was significantly more in the Posterior group than the Anterior + ALIF L5/S1 group; change in LL in the Anterior group was significantly more than in the Anterior + ALIF L5/S1 group and significantly more in the Posterior group than in the Anterior + ALIF L5/S1 group; remaining parameters did not show significant differences. At 2 years post-operative, there were no significant differences in parameter change between groups. The overall non-union rate was 15.7%. The Anterior group non-union rate was 11.8%, the Anterior + ALIF L5/S1 non-union rate was 23.1%, and the Posterior non-union rate was 14.3%. The overall rod breakage rate was 9.8%. The Anterior group rod breakage rate was 11.8%, the Anterior + ALIF L5/S1 rod breakage rate was 15.4%, and the Posterior rod breakage rate was 4.8%. There were no statistically significant differences in non-union or rod breakage rates between groups.

Conclusion: Surgical intervention for adult degenerative scoliosis does alter anatomy, regardless of approach. At two years post-operatively, changes from baseline in spinopelvic parameters were not significantly different between groups. In addition, pseudarthrosis and rod breakage rates were highest in the Anterior + ALIF L5/S1 group. Therefore, L5/S1 ALIF may not enhance deformity correction or protect against non-union or

rod breakage. Additional studies, including randomized trials, are necessary to further determine the global contribution of the L5/S1 disc space to spinal deformity and deformity correction.



RUWAN RATNAYAKE, M.D.

Education:

University of Washington

B.S. Neurobiology (2009)

Medical University of South Carolina College of Medicine

M.D. (2014)

Next Step:

Fellowship: San Diego Center for Spinal Disorders at Scripps

Career Objective:

I plan to treat a broad array of spine pathology on the west coast in a group practice setting.

Significant Other/Children:

Poonam Ratnayake

PERSONAL STATEMENT:

As the end of residency has arrived, it is truly incredible to reflect on all the things I have learned from my faculty, fellow residents, and staff here at UC Davis. Throughout my experiences with all of the orthopaedic services, I feel clinically and technically prepared to embark on my next chapter of training and the rest of my career. It brings me overwhelming pride to call myself a graduate of the UC Davis Orthopaedic Surgery residency program. I would like to thank all of my faculty mentors in the department as well as my family and residency classmates for their unwavering support throughout this journey.

Title: Risk Factors Associated with Dysphagia/ Dysphonia After Anterior Cervical Spine Surgery

Study Design: Retrospective cohort

Objective: Identify patient and procedural risk factors associated with postoperative otolaryngology consultation, speech therapy, or feeding tube placement due to dysphagia or dysphonia in patients undergoing anterior cervical spine surgery.

Summary of Background Data: While various risk factors have been identified for postoperative dysphagia and dysphonia after anterior cervical spine surgery, no clear indications have been established for when speech language pathology or otolaryngology should be consulted. Many have suggested otolaryngology and speech therapy consults as well as feeding tube placement in cases of prolonged or severe symptoms.

Methods: Patient demographics and procedural variables were collected for 204 patients who underwent anterior cervical spine surgery from 2010-2017 at a single center. Incidence of postoperative dysphagia and dysphonia, need for speech therapy consult, need for otolaryngology consult, and need for feeding tube were evaluated in the post-operative inpatient stay and up to 6 months postoperatively.

Results: The rate of dysphagia and dysphonia up to 6 months postoperatively was 23.5% and 8.3% respectively. 2.5% required an inpatient otolaryngology consult and 5.4% were operated on by otolaryngology within 6 months of the index neck operation. 8.3% required inpatient speech therapy consultation. 1.5% required feeding tube placement. Increased operative time as a continuous variable was associated with significantly higher odds of dysphonia (OR 1.512), need for speech therapy (OR 1.364), and need for a feeding tube (OR 1.649). An increased number of levels was associated with significantly higher odds of ENT consultation (OR 2.413), speech therapy assessment (OR 1.721), and need for a feeding tube (OR 2.609). In addition, surgery on level C4 and above was significantly associated with higher odds of speech therapy consult (OR 2.756).

Conclusion: Increased operative time is associated with a significantly higher risk of postoperative dysphonia, need for speech therapy consult, and need for feeding tube placement in anterior cervical spine surgery. The need for an ENT inpatient consult, speech therapy, and feeding tube placement was significantly higher with an increasing number of levels fused.



DONALD T. KEPHART, M.D.

2018-2019 Dickenson Research Resident

Education:

Dartmouth College

B.A. Environmental Studies (2011)

Emory University School of Medicine

M.D. (2016)

Title: Skeletal Age Assessment using the Calcaneal Apophyseal Stage in Children with Cerebral Palsy

Authors: Kephart, Laing, Vincent Tang, Bagley, Davids, Kulkarni

Purpose: Assessment of skeletal age is critical for appropriate timing of surgical interventions in children with cerebral palsy (CP). The calcaneal apophyseal stage (CAS) has been validated for clinical use in typically developing (TD) children (Li et al. JPO 2019). This study examines the reliability and applicability of CAS in ambulatory children with CP.

Methods: We retrospectively analyzed foot radiographs of ambulatory children with CP [Gross Motion Function Classification System (GMFCS) levels I – III] who had weight-bearing foot radiographs taken as a standard part of their 3D motion analysis studies between the years 2012 – 2018. Children with known endocrine or other growth disturbances were excluded. Multiple raters recorded the CAS for both feet in a randomized and blinded manner on two separate occasions. Inter-class Correlation Coefficients (ICC) were used to determine inter-rater and intra-rater reliability. As children under 7 and over 15 years old were under-represented, we limited our

analysis to CAS 1-4. ANOVA was used to assess the impact of GMFCS on the CAS: chronologic age relationship. The CP cohort was compared to the TD cohort by Welch's T-test. Student's T-Test was used to examine whether topographic distribution of CP (i.e., unilateral or bilateral CP) affected CAS.

Results: We identified a cohort of 410 patients (222 male, 188 female; ages 5-18; mean age 11.41; GMFCS I:152, GMFCS II:205, GMFCS III:53, 49 African-American, 116 Other, 245 White) with a total of 1578 lateral foot radiographs, with age distributed: 3(2), 4(2), 5(12), 6(48), 7(154), 8(174), 9(218), 10(168), 11(122), 12(156), 13(158), 14(148), 15(102), 16(76), 17(37). The inter-rater and intra-rater reliability was excellent (ICC > 0.9). GMFCS did not meaningfully affect the CAS scores. Consistent with TD children, there is a trend towards relatively accelerated skeletal advancement in African-American and female children with CP. Importantly, within each racial group, there is no statistically significant difference in CAS between children with CP and TD children (all $p > 0.05$ for all CAS analyzed). Topographic distribution of CP did not significantly affect CAS, with only 12.4 % of children having a CAS stage difference of 1 between sides, and none more than 1.

Conclusion: CAS is reliable and not influenced by GMFCS or topographic distribution in ambulatory children with CP. Children with CP have CAS values similar to their age-matched TD peers suggesting that the timing of interventions in children with CP should parallel that of TD children. Skeletal advancement in children with CP varies by race and gender as it does in TD children. CAS data provides an additional tool for assessment of skeletal maturity in children with CP utilizing radiographs already obtained in routine clinical assessment.