St Luke's Orthopaedic Research Journal

2024 - Volume II

EDITORS

Michael DeRogatis, MD; Margaret Higgins, MD; Jonathan McKeeman, MD; Akhil Sharma, MD; Brendan Smith, MD

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ST. LUKE'S UNIVERSITY HEALTH NETWORK

BETHLEHEM

St. Luke's University Hospital – Bethlehem
(Lehigh County)
Home of St. Luke's Children's Hospital

Total Admissions:	20,281
ER Visits:	45,791

ALLENTOWN

St. Luke's Allentown Campus
(Lehigh County)

Total Admissions:	12,537
ER Visits:	52,494

ANDERSON

St. Luke's Anderson Campus
(Northampton County)

Total Admissions:	19,363
ER Visits:	49,193

CARBON

St. Luke's Carbon Campus
(Carbon County)

Total Admissions:	4,120
ER Visits:	20,578

EASTON

St. Luke's Easton Campus
(Northampton County)

Total Admissions:	1,942
ER Visits:	21,342

GEISINGER ST. LUKE'S

Geisinger St. Luke's Hospital
(Schuylkill County)

Total Admissions:	3,974
ER Visits:	25,534

MINERS

St. Luke's Miners Campus
(Schuylkill County)

Total Admissions:	3,172
ER Visits:	20,335

MONROE

St. Luke's Monroe Campus
(Monroe County)

Total Admissions:	9,112
ER Visits:	49,947

SACRED HEART

St. Luke's Sacred Heart Campus
(Lehigh County)

Total Admissions:	4,942
ER Visits:	29,724

UPPER BUCKS

St. Luke's Upper Bucks Campus
(Bucks County)

Total Admissions:	6,375
ER Visits:	24,242

WARREN

St. Luke's Warren Campus
(Warren County, NJ)

Total Admissions:	5,115
ER Visits:	28,199

WEST END

St. Luke's West End Campus
(Lehigh County)
Home of St. Luke's Orthopedic Hospital – West End Campus

PENN FOUNDATION, LEHIGHTON & QUAKERTOWN

Region's largest network of behavioral health services.

St Luke's
UNIVERSITY HEALTH NETWORK

100 TOP HOSPITALS

St. Luke's University Health Network is a regional, integrated Network of hospitals, physicians and other related organizations providing care in Lehigh, Northampton, Monroe, Carbon, Schuylkill, Luzerne, Bucks, Montgomery and Berks counties in Pennsylvania and Warren and Hunterdon counties in New Jersey.

ST. LUKE'S UNIVERSITY HEALTH NETWORK

St. Luke's University Health Network's vision is to achieve top decile performance in clinical quality and safety measures, provide exceptional service and be perceived as EASY to use by everyone accessing our services.

The Network's flagship University Hospital has earned the 100 Top Major Teaching Hospital designation from Fortune/PINC AI 11 times total and nine years in a row, including in 2023 when it was identified as THE #4 TEACHING HOSPITAL IN THE COUNTRY. In 2021, St. Luke's was identified as one of the 15 Top Health Systems nationally.

It is the only Lehigh Valley-based health care system to earn Medicare's five-star ratings (the highest) for quality, efficiency and patient satisfaction. It is both a Leapfrog Group and Healthgrades Top Hospital and a Newsweek World's Best Hospital.

The fully integrated system includes Pennsylvania's largest trauma network and hospital-based EMS unit; 24 Care Now walk-in urgent care locations and many other health care services, such as home health and hospice.

St. Luke's Care Network comprises St. Luke's-owned practices (St. Luke's Physician Group) with nearly 2,200 physicians, nurse practitioners and physician assistants; and independent practices with nearly 400 physicians, nurse practitioners and physician assistants.

Areas of exceptional medical expertise include:

- Largest network of trauma centers in Pennsylvania (7)
- Cardiology/Cardiovascular Surgery
- Oncology
- Orthopedics
- Neuroscience
- Robotic/Minimally Invasive Surgery
- Radiology
- Obstetrics/Perinatal Care
- Bariatric Surgery
- Hernia Surgery
- Pediatrics

92,079 annual admissions & observations

367,379 annual emergency room visits

20,000 employees, region's second largest employer

2,200 doctors and advanced practitioners*

1,906 volunteers contributing 139,595 hours of service

**Representing more than 100 specialties (90% of physicians are board-certified)*

Medical Education

An exceptional commitment to the advancement of medical education has been a core St. Luke's focus since its inception in 1872. St. Luke's is one of only 400 members of the prestigious Council of Teaching Hospitals.

In response to the shortage of physicians facing our nation, St. Luke's and the Lewis Katz School of Medicine partnered to develop the first and only medical school campus in the Lehigh Valley. Students spend all four years at St. Luke's University Hospital – Bethlehem. The inaugural class graduated in 2015. St. Luke's expects to graduate 300 physicians in 10 years and to retain 150 (50 percent) in the Lehigh Valley region.

St. Luke's offers more than 470 intern/resident/fellowship positions in 50 accredited programs. Teaching staff hold faculty appointments at the Lewis Katz School of Medicine, The University of Pennsylvania and Philadelphia College of Osteopathic Medicine.

Additionally, St. Luke's School of Nursing is the nation's longest continuously operating nursing school. The fully accredited program currently enrolls 150+ students. St. Luke's is also a major allied health training site. More than 560 students representing 80+ colleges, universities and technical institutes annually spend 123,300 hours at St. Luke's.

Medical education throughout the Network is supported by St. Luke's Simulation Center, which provides advanced training through specialized educational technology and "real world" learning environments.

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Lewis Katz School of Medicine

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Preface

We are delighted to present the second edition of the St. Luke's Orthopaedic Journal (SLOJ). This edition stands as a testament to the unwavering dedication and hard work of all our residents, showcasing another successful year of research.

Our heartfelt gratitude extends to our industry sponsors, whose support has been instrumental in the enhanced quality of our journal. We also express appreciation to Dr's. Lundy, Matullo, and Greenhill whose valuable insights have shaped this edition. Reflecting on the past year, we take pride in the significant milestones achieved by our orthopaedic department, including the establishment of our standalone orthopaedic hospital in Allentown, the addition of several orthopaedic surgeons, and the accreditation of St. Luke's Bethlehem becoming a pediatric hospital.

This edition provides a platform to share the outcomes of our ongoing research endeavors, underscoring the continuous academic advancement of our department. We trust that this journal will offer an engaging read, serving as an inspiring reminder of our collective efforts to make a positive impact.

Congratulations are in order for the graduating class of 2024. We take immense pride in these talented young surgeons, who are embarking on prestigious fellowships in sports medicine at SCOI and trauma at Allegheny. We eagerly anticipate welcoming these skilled individuals to our alumni program.

A special acknowledgment goes to our assistant editors, Brendan Smith, Margaret Higgins, and Jonathan McKeeman as well as Francis Kulls, our administrative assistant, whose coordination played a pivotal role in bringing this year's journal to fruition.

Akhil Sharma, MD

Michael DeRogatis, MD, MS

Chairman's Corner

The 2024 Fiscal Year has been a very busy period for the Department of Orthopaedic Surgery at St. Luke's! The Network and the Department continue to expand and advance, and with these changes come significant opportunities for our residents. We have no intention of slowing our progress as we continue to develop the phenomenal vision of our founder, Dr. Bill Delong.

Most notably, we opened the first Orthopaedic Hospital in the St. Luke's network! This 52,000 sq ft facility is state-of-the-art in terms of providing the ultimate environment to practice routine and complex orthopaedic surgery. We opened with four operating rooms with four more to fit out as volume develops. These ORs are the largest in the network at 613 sq ft boasting five-arm booms, laminar flow, and the most up-to-date equipment available. The hospital is designed with same-day total joint arthroplasty in mind enabling our surgeons to optimize workflow and efficiency in this patient group. Our surgeons currently perform 49% of all total hip and 34% of all total knee arthroplasties as "same-day" procedures. We have four pre-op "block bays" where our anesthesiologists apply regional anesthetics enabling significant pain relief after surgery. For the patients who need to stay, we have ten beautiful patient rooms on the second floor with the nicest finishes in St. Luke's. This new hospital has revolutionized orthopaedic surgery in the central and western portions of our network.

We continue to expand our physician base with thirty-seven orthopaedic surgeons, twelve spine & pain physicians, ten primary-care sports medicine physicians, twelve podiatrists and three chiropractors. Along with our forty-six physician assistants and nurse practitioners, the service line is more capable of taking care of the ever-increasing demand for musculoskeletal services across the Lehigh Valley and beyond. Not surprisingly, the vast majority of our physicians want to teach, and the wide base of specialists in our practice provides substantial learning opportunities for our thirteen orthopaedic residents!

Recognizing that the Musculoskeletal Service Line has 451 team members supporting seventy-four physicians and twenty-four residents and fellows, the network has promoted my dyad partner, Jessica Kamensky, to the position of Vice President. Jessica's promotion recognizes the tremendous contribution that the MSK Service Line makes to the network, and her position benefits our work and mission.

We have also begun the STAR Leadership Academy focusing on developing leadership in our physician and administrative leaders. Our surgeons just completed the 1,000th robotic total knee arthroplasty in the network! We continue to excel in improving our solid quality metrics and high patient satisfaction scores. We have had a great rotation of Grand Rounds speakers including ABOS President April Armstrong, MD and AOA Presidents Wayne Sebastianelli, MD and Ann Van Heest, MD.

Lastly, we could not be prouder of our orthopaedic residents as they continue to excel and show us what great orthopaedic surgeons look like! These men and women continue to push the ceiling of performance and achievement. As seen in this Journal, the academic output combined with their strong work ethic and just being great people makes our work extremely rewarding and satisfying. I also cannot say enough about the steadfast dedication and dynamic leadership of Vice Chair/Program Director Kris Matullo, MD, Assistant Program Director Dustin Greenhill, MD and Residency Coordinator Nicole Toland. This dream team keeps us headed in the right direction by their incredible devotion and resolve. I tell my friends around the country that I have the best job in the best place with the best people! The future of orthopaedic surgery at St. Luke's keeps getting brighter!

Douglas Lundy, MD, FAAOS, FAOA
Chair, Department of Orthopaedics

Program Director's Corner

Things continue to progress within the St. Luke's University Hospital Department of Orthopaedic Surgery during the academic year of 2022-2023. We have added Dr. Dustin Greenhill, MD as an associate program director for the orthopaedic residency. Dr. Greenhill is a pediatric orthopaedic surgeon and has been a member of our faculty for a few years. Dr. Greenhill is well published, regularly contributes to POSNA, and was a writer and editor for the pediatric section of the ROCK by the AAOS. Dustin is passionate for research and quality and will be overseeing the research and QI portion of the residency. Our department put out its first annual research journal last year and had our first annual research day with Dr. Marco Rizzo, MD as our esteemed guest professor and judge.

We have now fully transitioned to the ROCK by AAOS for our morning education sessions. We now require all teaching attendings to provide specific morning lectures in person to the residents, increasing the number of in-person lectures and increasing the attending involvement in morning conferences. Our rotations are now changed to every 2 months allowing the residents to rotate through attendings more frequently within our mentorship model. We added a pediatric rotation to the PGY-2 year, proving 2 months of training in pediatric trauma, spine and lower extremity reconstruction prior to the time spent at CHOP during the PGY-3 year. This has been well received by the residents. The PGY-2 trauma rotation has been split allowing access to both of our trauma surgeons and making consultations easier to complete given the changes in the rotation schedule. We have also added a dedicated shoulder and elbow rotation during the PGY-4 year with our fellowship trained shoulder and elbow surgeon, Dr. Hithem Rahmi who performs not only complex upper extremity trauma, but also reconstruction of the shoulder and elbow. We have also added an advanced adult reconstruction rotation with Dr. Greg Gilson and an orthopaedic oncology rotation with Dr. Justin Miller during the PGY-4 and 5 years.

Our conference room was recently remodeled and expanded to allow our full complement of residents, medical students and attendings in a fully modern and technically advanced smart room within our department. All conferences are now held in this space and can easily be linked to distant attendings virtually with our camera and microphone setup. We have also continued our business and leadership talks with Dr. Lundy but are planning to expand to include a formal leadership course on Friday mornings for all PGY 4 and 5 year residents. The program also continues to be at the forefront of change, as we have participated in the AOA KSB application and case logging development as 1 of 2 major pilot programs. The residents are now fully utilizing the KSB system for weekly case evaluations, professional and behavioral assessments and 360 evaluations for professional growth and feedback.

Across the MSK service line, we have significant updates as well. Dr. Paul Duffy is leading our newest division, Chiropractic Medicine, with significant accomplishments. They have started work at the comprehensive spine program, Moravian University and Northampton Community College. A chiropractic preceptorship with Palmar University is starting in April of 2024 with a planned SLUHN Chiropractic residency targeted in 2025. Spine and Pain, under the guidance of Dr. Kyle Weiss successfully matched 2 residents in its inaugural year of fellowship and applications for their fellowship are up over 25% this year. Our podiatry department, under the direction of Dr. Robert Diamond, matched its top 3 applicants and has introduced a new Assistant Residency Director, Dr. Eric Bronfenbrenner. Primary Care Sports Medicine, led by Dr. Maheep Vikram, hired one of its own to stay on at SLUHN, expanded its rotation to include ski medicine/winter sports experience, and brought ultrasound to the sidelines for improved care of our athletes.

We look forward to many more advances during the next year!

Kristofer S. Matullo, MD, FAOA
Vice Chair of Orthopaedic Surgery
Orthopaedic Surgery Residency Director and Division Chief of Hand Surgery

Associate Program Director's Corner

As both the orthopaedic surgery residency program and entire musculoskeletal department at St. Luke's University Health Network (SLUHN) continue to grow, so do their academic products! Our department is currently conducting single-center and regional/national/international multicenter retrospective and prospective investigations, biomechanical tests of orthopaedic implants, database analyses, and analyzing quality improvements of pharmacologic, radiologic, and technologic aspects of care we routinely deliver.

"I really want to review 3,000 charts for my retrospective project!"… said no resident ever. It is very difficult during a high-volume surgical residency to produce research when it comes appropriately second to providing personalized patient care and mastering the field of orthopaedic surgery. However, within the past year our residents and faculty have showcased research and provided educational sessions at the annual meetings of the American Academy of Orthopaedic Surgeons (AAOS), Orthopaedic Trauma Association, Pediatric Orthopaedic Society of North America (POSNA), American Orthopaedic Foot & Ankle Society (AOFAS), Pennsylvania Orthopaedic Society, Twentieth Century Orthopaedic Association, and more.

Resident and faculty effort at these meetings was complemented by accolades including best poster (AAOS), best ePoster (POSNA), a nomination for the Roger A. Mann award (AOFAS), and best podium presentations (SLUHN Research Day, SLUHN Quality Awards, and SLUHN medical student research day).

The current post-doctoral research fellow, Robert Gomez, M.D., helped propel our efforts by doing much more than close abstracts and manuscripts. He has selflessly initiated prospective and retrospective projects that will outlast his single year in this position, humbly led groups of junior residents and medical students through the research planning process, earned the overwhelming support of our institutional research staff, and proactively finalized many implied tasks that often go unrecognized.

We have integrated several medical students from the Temple / St. Luke's School of Medicine as well as students from at least three Philadelphia-based medical schools into our academic endeavors. Their efforts helped complete multiple projects (of which some, for example, were accepted for presentation during a highly competitive year whereby the European and North American pediatric orthopaedic societies combined their annual meeting). We plan to continue, and constantly improve, this available experience for medical students each year.

We hope this journal can complement the research efforts of our current residents and offer readers at least some formal insight into our program. Stay tuned!

Dustin A. Greenhill, M.D., FAAOS
Pediatric Orthopaedic Surgery & Scoliosis, Orthopaedic Surgery Associate Program Director, St. Luke's University Health Network and Assistant Clinical Professor (Adjunct), Temple University School of Medicine

Year in Review

New Orthopaedic Faculty 2023 - 2024

Michael Hendel, MD
Sports Medicine
Fellowship:
Hospital for Special Surgery

Jeremy Raducha, MD
Hand Surgeon
Fellowship:
Duke University

Eric Pridgen, MD
Sports Medicine
Fellowship:
Washington University

Ryan O'Donnell, MD
Sports Medicine
Fellowship:
Brown University

Andrew Konopitski, MD
Adult Reconstruction
Fellowship:
UT Houston

Visiting Professors

Wayne Sebastianelli, MD

Wayne J. Sebastianelli, MD is the current secretary of the American Board of Orthopaedic Surgery (ABOS) and has served as the Chair of the ABOS Subspecialty Certification and Written Examination Committees. He is the Kalenak Professor in Orthopaedics at Penn State Health Milton S. Hersey Medical Center and Medical Director for Penn State Sports Medicine where he specializes in sports medicine. Dr. Sebastianelli was the distinguished speaker at our 3rd Annual William G. DeLong Memorial Grand Rounds on May 9, 2023. The focus of his talk was on the development of leadership skills in orthopaedics. The residents were able to have an in-depth discussion with Dr. Sebastianelli the night before his lecture over dinner at Edge Restaurant. He discussed what steps he took as a resident, fellow, and early attending that helped carve a path for his professional success. He also discussed the importance of implementing a healthy work-life balance in a career in orthopaedic surgery.

Visiting Professors *(continued)*

April Armstrong, MD

April Armstrong, MD is the C. McCollister Evarts Professor and Chair of Orthopaedic Surgery at Penn State Health Milton S. Hershey Medical Center and is their Chief of the Shoulder and Elbow Service. She serves as the current President of the American Board of Orthopaedic Surgery (ABOS). She is the second woman to be president of the ABOS. She is Associate Editor for the Journal of Shoulder and Elbow Surgery. She also holds leadership positions within the American Society of Shoulder and Elbow Surgeons (ASES). On August 30, 2023, St. Luke's was honored to host Dr. Armstrong as a visiting lecturer. She discussed leadership in orthopaedics and provided insight on her professional development. During her time as a clinical educator, she has received numerus awards for excellence in teaching. Her core research is on the glenoid with special focus on morphology, glenoid component design, biomechanical loading, and three-dimensional modeling.

Ann Van Heest, MD

Ann E. Van Heest, MD is Senior Director of the American Board of Orthopaedic Surgery (ABOS). She has served as Vice President and Chair of the ABOS Graduate Medical Education and Subspecialty Committees. She is Professor and Vice-Chair of Education in the Department of Orthopaedic Surgery at the University of Minnesota where she practices as a hand surgeon, specializing in pediatric hand surgery. She was one of the first female program directors in the country. Dr. Van Heest was our distinguished grand rounds speaker on December 13, 2023. She spoke about how she paved a path for herself in pediatric hand surgery and the fulfillment the career brings her. Her passion is resident education, and she has been instrumental in the biggest upcoming change in orthopaedic training - the transition to a competency-based curriculum. She discussed how orthopaedic residency looks vastly different today compared to a few decades ago (for the better), and she inspired the audience to continue to adapt to meet the new challenges of tomorrow.

Clinical Updates

This past year at St. Luke's, we have undergone a lot of changes that have advanced our clinical practice. We have added many new faculty members, received numerous accolades within the department as well as within the network, and have continued to push the envelope when it comes to adopting the latest innovations in orthopaedic surgery, with integration of technologies such as VELYS and robotic-assisted navigation in spine surgery. There have been two notable additions this year that have really set St. Luke's a cut above its peers this year – the Children's Hospital, and the new Orthopaedic Hospital!

The Children's Hospital at St. Luke's Bethlehem is here, and is helping kids with everything from routine checkups to specialized care. Children who stay in our hospital are being treated with leading expertise in orthopaedic care by Dr. Dustin Greenhill and Dr. Nicholas Grimm. This centralized children's hospital system integrates routine primary care with pediatric specialists, and encompasses pediatric emergency rooms, surgical, inpatient and critical care units dedicated to children. It has been a huge success thus far and we look forward to continuing to expand!

The new St. Luke's Orthopaedic Hospital is located at our West End Campus in Allentown. With the efforts of Network President & CEO Richard Anderson, and our Chairman Dr. Lundy, we are bringing innovative, world-class surgical care to the Lehigh Valley! We have successfully garnered an expert team of orthopaedic surgeons versed in same-day total joint replacements for hips and knees, shoulder surgery, hand and upper extremity surgery, and minimally invasive arthroscopic procedures for sports-related injuries, including ACL and rotator cuff repair. We have also been able to connect our patients with board-certified orthopaedic clinical specialists in physical therapy following their surgery to quicken their recovery and get them back to doing what they love. Our patients and orthopaedic surgeons alike have both stated that they love the new Hospital, and we are excited to see what new avenues this will lead to!

Finally, we wanted to acknowledge the work of Dr. Greenhill, as he has not only been promoted to Associate Program Director this past year, but his work has also been recognized on a national platform. He has been appointed to serve on the Pediatrics Content Committee within the American Academy of Orthopaedic Surgeons (AAOS). This committee analyzes data and information to identify member knowledge needs in the pediatrics content area based on industry/healthcare data, market information, and Academy product/program evaluation, membership evaluation and survey results. This commitment to helping advance orthopaedics on a national platform is commendable, and we wish him great success in this role!

The Department of Orthopaedic Surgery has really knocked it out of the park this year…excited to see what's in store for next year!

Sincerely,

Akhil Sharma

REGIONAL NEWS

St. Luke's opens orthopedic hospital in South Whitehall

By Leif Greiss
The Morning Call

The new St. Luke's Orthopedic Hospital is seen on the grounds of the network's West End Medical Center in South Whitehall Township. The new hospital was officially opened with a ribbon-cutting ceremony on Wednesday. The first surgeries are scheduled for Monday.

Starting next week, Lehigh Valley residents in need of orthopedic care will have a new option through St. Luke's University Health Network.

The network showed off the two-story, 52,000-square-foot St. Luke's Orthopedic Hospital in South Whitehall Township during a ribbon-cutting Wednesday. It's equipped to handle same-day surgeries of the knee, hip, spine, hand and shoulder, as well as treat a myriad of sports-related fractures and other injuries. It opens for patient visits Monday.

The network spent $44 million to build the hospital into St. Luke's West End Medical Center, 501 Cetronia Road. Its first floor houses eight operating rooms and 24 rooms for care before and after surgery, along with support, auxiliary space and waiting rooms. The second floor is dedicated to patient overnight rooms and staff and supplies space. Some rooms will be closed off for future use.

"We want our patients to realize this facility was built completely around their needs," said Dr. Douglas Lundy, St. Luke's chair of orthopedics.

To staff the new hospital, the network is adding about 80 nurses, technicians, therapists and other staff.

The hospital also will use the VELYS robot-assisted orthopedic surgery system to help surgeons with information gathering and decision-making during knee surgery. Other advanced technology will be used to maximize safety, accuracy and quality operative outcomes.

A patient room is shown Wednesday at the new St. Luke's Orthopedic Hospital on the grounds of the network's West End Medical Center in South Whitehall Township.
AMY SHORTELL/THE MORNING CALL PHOTOS

The opening of St. Luke's new orthopedic hospital follows the opening of Good Shepherd Rehabilitation's inpatient hospital in Upper Macungie less than five months ago. That 123,000-square-foot and 76-bed facility is equipped to take care of people with complex medical conditions, such as stroke, spinal cord injury and brain injury.

The opening of St. Luke's new orthopedic hospital follows the opening of Good Shepherd Rehabilitation's inpatient rehabilitation hospital in Upper Macungie less than five months ago. That 123,000-square-foot and 76-bed facility is equipped to take care of people with complex medical conditions, such as stroke, spinal cord injury and brain injury.

Lehigh Valley Health Network also has spent the last few years upping its orthopedic offerings. In 2019, it acquired Coordinated Health with 1,200 employees and 22 locations in Pennsylvania and New Jersey. Then in 2022, the network announced it would integrate all coordinated facilities and practices into its Lehigh Valley Orthopedic Institute.

When St. Luke's announced the new orthopedic hospital in September, it noted that the hospital is the result of a rising need for orthopedic care. St. Luke's orthopedic specialists complete about 15,000 musculoskeletal surgeries across the network each year. The network estimates that orthopedic surgeons will perform nearly 3,000 elective operations in this hospital alone during 2024.

"This hospital is the logical next step in the continuing evolution in our orthopedics program, and it will take patient care to the next level of quality and efficiency," said Jessica Kamensky, service line administrator for St. Luke's musculoskeletal service line.

St. Luke's Orthopedic Surgery

Phone: 484-526-1735


Douglas Lundy, MD
Trauma
Chairman, Dept of Orthopedics

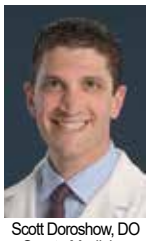

Kristofer Matullo, MD
Hand & Elbow
Vice Chairman


Jennifer Banzhof, DO
Joint Replacement


Patrick Brogle, MD
Trauma &
Joint Replacement


Gregory Carolan, MD
Sports Medicine


Donald Diverio, DO
General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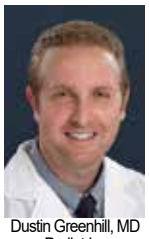
Sports Medicine


Amir Fayyazi, MD
Spine Surgery


Gregory Gilson, DO
Joint Replacement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Sports Medicine


Michael Hendel, MD
Sports Medicine

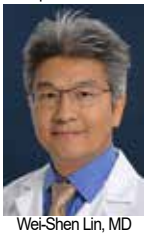

Leigh Hopkins, MD
General


Glen Jacob MD
Hand & Elbow


Alexander J. Johnson, MD
Sports Medicine


Andrew Konopitski, MD
Joint Replacement


James Lachman, MD
Foot & Ankle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General


Justin Miller, DO
Orthopedic Oncology & General


Megan Mizera, MD
Hand & Elbow


Anastassia Newbury, MD
Hand & Elbow


Chinenye Nwachuku, MD
Trauma &
Joint Replacement


Ryan O'Donnell, MD
Sports Medicine


Scott Polansky, DO
Trauma


Eric Pridgen, MD
Sports Medicine


Jeremy Raducha, MD
Hand & Elbow


Hithem Rahmi, DO
Shoulder & Elbow

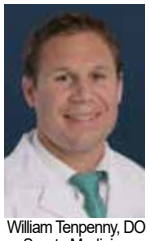

David Ramski, MD
Trauma


James Sacco, DO
General


Adam Sadler, DO
Joint Replacement


Tyler Smith, DO
Sports Medicine


Gonzalo Sumarriva, MD
Hand & Elbow


William Tenpenny, DO
Sports Medicine


Colin Whitaker, MD
Spine Surgery


Kimberly Zambito, MD
Hand & Elbow

St Luke's
Orthopedic Care

10/2023

Chief Residents

Nathan White, MD

Nathan, originally from San Diego, California, attended Rice University for his undergraduate studies and Baylor College of Medicine for medical school. After completion of his chief year at St. Luke's University Health Network, he will move to Los Angeles, CA for his fellowship in sports medicine at the Southern California Orthopaedic Institute. As he looks back on his time at St. Luke's, Nathan remarks that he is most thankful for his mentors during residency. The wisdom and foundation his mentors have laid are something that he feels has prepared him well for a career as an orthopaedic surgeon. He will always be indebted to them and the investment they have poured into him.

Juan Diego Tio Pagan, MD

Juan was born and raised in the southwest of Puerto Rico. He graduated from the University of Puerto Rico in Mayaguez with a bachelor's in Industrial Microbiology and then obtained his Medicine Degree in the University of Puerto Rico Medical Sciences Campus. He always knew he wanted to work with his hands and think outside the box, so he decided to pursue a career in the field of orthopaedics. He was honored to have matched into St Lukes University Health Network back in 2019 and has been very grateful for all the experiences he has had. During his training, he has experienced personal and professional growth and has made great connections with his mentors and other residents. Juan will be completing a fellowship in Orthopaedic Trauma at Allegheny Health Network in Pittsburgh, PA.

St. Luke's Orthopaedic Surgery Residents 2023-24


Juan Tio-Pagan, MD
PGY-5


Nathan White, MD
PGY-5


Timothy Renzi, MD
PGY-4


Brendan Smith, MD
PGY-4


Ryan De Leon, MD
PGY-3


Michael DeRogatis, MD
PGY-3


Akhil Sharma, MD
PGY-3

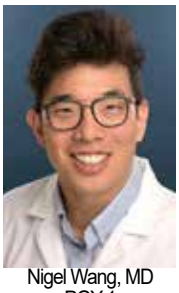

Margaret Higgins, MD
PGY-2


Jonathan McKeeman, MD
PGY-2


Samantha Weiss, MD
PGY-2


Trevor Luck, MD
PGY-1


Dhairya Shukla, MD
PGY-1


Nigel Wang, MD
PGY-1

St Luke's
Orthopedic Care

Research Division

Resident Presentations in the 2023-2024 Academic Year

1. DeRogatis MJ, Pellegrino AN, Wang N, Higgins MJ, Issack PS, Sokunbi G, Carmona A, Gould W, Konopitski A, Brogle P; Remote Monitoring After Same-Day Total Joint Arthroplasty Reduces Hospital Readmissions. Podium presentation, Orthopaedic Summit, September 19-23, 2023, Boston, MA.

2. Weiss S, McKeeman J, Higgins MJ, Lachman J; Comparison of PROMIS Scores for Common Foot and Ankle Procedures. E-Poster at AOFAS Winter Meeting January 2023.

3. Gomez RW, Lamb ZJ, Jessen D, Storino MC, Greenhill DA. Who Should See My Kids? Clavicle Fracture Management Across Orthopaedic Subspecialties. International Pediatric Orthopaedic Symposium. Orlando, FL. December 2023.

4. DeRogatis MJ, Pellegrino AN, Wang N, Higgins M, Issack PS, Sokunbi G, Carmona A, Gould W, Konopitski A, Brogle P; Remote Monitoring After Same-Day Total Joint Arthroplasty May Reduce Hospital Readmissions. Podium presentation at Pennsylvania Orthopaedic Society Annual Meeting. Pittsburg, PA; September 2023.

5. DeRogatis MJ, Pellegrino AN, Wang N, Higgins M, Issack PS, Sokunbi G, Carmona A, Gould W, Konopitski A, Brogle P; Remote Monitoring After Same-Day Total Joint Arthroplasty May Reduce Hospital Readmissions. Podium presentation at First Annual Orthopaedic Surgery Research Meeting, 2nd place winner; Bethlehem, PA; May 2023.

6. Malige A, DeRogatis MJ, Michaud A, Usewick M, Stoltzfus J, Pellegrino AN; The Evolution of Anesthetic Management and Efficacy of an Enhanced Recovery After Surgery Protocol for Total Knee Arthroplasty. Podium presentation at St. Luke's University Health Network Annual Research Celebration. Bethlehem, PA; June 2023.

7. Malige A, DeRogatis MJ, Michaud A, Usewick M, Stoltzfus J, Pellegrino AN; The Evolution of Anesthetic Management and Efficacy of an Enhanced Recovery After Surgery Protocol for Total Knee Arthroplasty. Poster presentation at 2023 Annual St. Luke's University Health Network Quality Awards. Honorable Mention Award; Bethlehem, PA; October 2023.

8. Malige A, DeRogatis MJ, Michaud A, Usewick M, Stoltzfus J, Pellegrino AN; The Evolution of Anesthetic Management for Total Knee Arthroplasty Patients: An Academic Hospital Network Experience. Podium presentation at 2023 St Luke's University Health Network Resident/Fellow QI Symposium; Bethlehem, PA; November 2023

9. DeRogatis MJ, Pellegrino AN, Wang N, Higgins M, Issack PS, Sokunbi G, Carmona A, Gould W, Konopitski A, Brogle P; Remote Monitoring After Same-Day Total Joint Arthroplasty May Reduce Hospital Readmissions. Poster presentation at St. Luke's University Health Network Annual Research Celebration. Bethlehem, PA; June 2023.

10. DeRogatis MJ, Pellegrino AN, Wang N, Higgins M, Issack PS, Sokunbi G, Carmona A, Gould W, Konopitski A, Brogle P; Remote Monitoring After Same-Day Total Joint Arthroplasty May Reduce Hospital Readmissions. Poster presentation at Society for Ambulatory Anesthesia Annual Meeting. Phoenix, AZ; May 2023.

11. DeRogatis MJ, Pellegrino AN, Wang N, Higgins M, Issack PS, Sokunbi G, Carmona A, Gould W, Konopitski A, Brogle P; Remote Monitoring After Same-Day Total Joint Arthroplasty May Reduce Hospital Readmissions. Podium presentation at Orthopaedic Summit Conference. Boston, MA. September 2023.

12. Sharma A, Wang NK, Nguyen VK, Matullo KS, Sokunbi G. The Spine Trifecta: An Analysis of Patients Who Have Undergone Lumbar Decompression/Fusion, Spinal Cord Stimulator Placement, and Sacroiliac Joint Fusion. OREF Northeast Region Resident Symposium. Cambridge, MA. October 2023.

Resident Presentations in the 2023-2024 Academic Year (continued)

13. Sharma A, Wang NK, Nguyen VK, Matullo KS, Sokunbi G. The Spine Trifecta: An Analysis of Patients Who Have Undergone Lumbar Decompression/Fusion, Spinal Cord Stimulator Placement, and Sacroiliac Joint Fusion. Podium presentation at Pennsylvania Orthopaedic Society. Pittsburgh, PA. September 2023.

14. Sharma A, De Leon R, Malige A, Lachman JR. The DeOrio One Finger Test: Does a Patient's Ability to Localize Their Pain Lead to Different Clinical and Patient Reported Outcomes Than Those that Cannot? Poster presentation at American Orthopaedic Foot and Ankle Society Annual Meeting, Louisville, KY. 2023.

15. Sharma A, De Leon R, Malige A, Lachman JR. The DeOrio One Finger Test: Does a Patient's Ability to Localize Their Pain Lead to Different Clinical and Patient Reported Outcomes Than Those that Cannot? Poster presentation at AAOS 2023 annual meeting. Won symposium highlights award.

16. De Leon R, Sharma A, Malige A, Lachman JR. Lisfranc Injuries in the General Population: A Comparison of Outcomes Among Age Groups. Poster presentation at American Orthopaedic Foot and Ankle Society Annual Meeting, Louisville, KY. 2023.

17. Higgins, M.J., McKeeman, J.D., Weiss, S.N. Is There Still a Learning Curve for Primary TAA after Completing a High Volume Ankle Replacement Fellowship? A Multicentered Study. E-poster at AOFAS Winter Meeting. Tampa Bay, FL, Jan 2024.

18. Weiss, S.N, McKeeman, J.D., Higgins, M.J. "I can't exercise because my foot hurts me too much." Does BMI change after common foot and ankle surgeries? A retrospective review. E-Poster presentation at AOFAS Winter Meeting. Tampa Bay, FL. January 2024.

19. McKeeman, J.D., Rivera, J.C., Johnson, B.A. A Systematic Review of Two Prominent Treatments of Athletic Pubalgia. E-Poster presentation at Eastern Orthopaedic Association, Charleston, SC, October 2023.

20. Karasavvidis, T., McKeeman, J.D., Olsen, R., Zielinksi, K., Marx, R., Pellios, S. Early and Delayed Meniscal Repair Surgery Have Equivalent Results: A Systematic Review and Meta-Analysis. Podium presentation at Orthopaedic Summit: Evolving Techniques, Boston, MA, Sep 2023.

21. McKeeman, J.D., Higgins, M.J., Weiss, S.N., Patient Reported Outcomes Before and After Revision Total Ankle Arthroplasty Done in the First Two Years of a Single Surgeons Practice. Poster presentation at AOFAS Annual Meeting. Louisville, KY, September 2023.

22. Karasavvidis, T., McKeeman, J.D., Olsen, R., Zielinksi, K., Marx, R., Pellios, S. Early and Delayed Meniscal Repair Surgery Have Equivalent Results: A Systematic Review and Meta-Analysis. Poster presentation at ICRS World Congress, Sitges-Barcelona, Spain, September 2023.

23. Sharma, A, McKeeman, J.D., Greenhill, D.A., Harrast, J.J., Martin, D.F., Lundy, D.W. Do Half of Orthopaedic Surgeons Really Changes Jobs within the First Two Years? An Analysis of Trends in Practice Locations among Early-Career Orthopaedic Surgeons. Podium presentation at Twentieth Century Orthopaedic Association Annual Meeting. Albuquerque, NM, August 2023.

24. Smith B, Mckeeman J, Pellegrino A, Malige A, Bates R, Lachman J. The Efficacy of Liposomal Bupivacaine in Managing Postoperative Pain in Foot and Ankle Surgeries. St. Luke's University Health Network Research Day Presentation. First place prize winner. June 2023.

25. Smith B, Mckeeman J, Pellegrino A, Malige A, Bates R, Lachman J. The Efficacy of Liposomal Bupivacaine in Managing Postoperative Pain in Foot and Ankle Surgeries. Podium presentation at AOFAS Winter meeting in Tampa Bay, FL. January 2024.

26. Smith B, Mckeeman J, Pellegrino A, Malige A, Bates R, Lachman J. The Efficacy of Liposomal Bupivacaine in Managing Postoperative Pain in Foot and Ankle Surgeries. Poster presentation at AAOS annual meeting in San Francisco, CA. February 2024.

Research Division

Resident Publications in the 2023-2024 Academic Year

1. White, Nathan W., Matullo, Kristofer S. Concomitant Internal Joint Stabilizer Augmentation with Lateral Ulnar Collateral Ligament Repair for Unstable Elbow Dislocations: A Surgical Technique. Journal of Shoulder and Elbow Surgery, Reviews, Reports and Techniques. Accepted January 2024.

2. Amato, Chad A., White, Nathan W., Tio, Juan D., Rodriquez, William, Matullo, Kristofer S., Retention of Post-Operative Instructions Utilizing Video Vs. Written Instructions: A Prospective Randomized Study. Journal of Hand Surgery Global Online. November 2023.

3. Cummings, Jason L., Oladeji, Afolayan K., Rosenfeld, Scott, Johnson, Megan, Goldstein, Rachel, Georgopoulos, Gaia, Stephenson, Lindsay, White, Nathan W., Hosseinzadeh, Pooya, Outcomes of Open Reduction in Children with Developmental Hip Dislocation: A Multicenter Experience Over a Decade. Journal of Pediatric Orthopaedics. 43(6):p 405-410, July 2023.

4. Greenhill DA, Mundluru SN, Gomez RW, Romero J, Riccio AI. Metaphyseal Fracture Displacement is Predictive of Intra-articular Diastasis in Adolescent Triplane Ankle Fractures. J Pediatr Orthop. 2023 October.

5. DeRogatis MJ. AO Trauma Ukraine President Oleksandr Rikhter, MD Shares His Experiences during the Russia-Ukraine War. AAOS Now. September 2023

6. DeRogatis MJ, Higgins M, Laporte D. Breaking Down Barriers: Promoting Paternity Leave in Residency. AAOS Now. November 2023.

7. DeRogatis MJ, Issack PS. OVT Review: Indications and Technique: Contemporary Hip Arthroscopy for FAI. AAOS Now. 2024 May.
   DeRogatis MJ, Issack PS, Gabrieli J. OVT Review: Fully Waterproof One-Leg Spica Cast for Femur Fractures. AAOS Now. 2024 March/April.

8. Malige A, DeRogatis MJ, Michaud A, Usewick M, Stoltzfus J, Pellegrino AN; The Evolution of Anesthetic Management and Efficacy of an Enhanced Recovery After Surgery Protocol for Total Knee Arthroplasty. Abstract in International Journal of Academic Medicine. Oct-Dec 2023.

9. Konopitski A, DeRogatis MJ, Malige A, Wang N, Sadler A, Brogle P; Perioperative Anemia in Robotic Assisted versus Manually Instrumented Total Knee Arthroplasty. Abstract in International Journal of Academic Medicine. Oct-Dec 2023.

10. DeRogatis MJ, Pellegrino AN, Wang N, Issack PS, Sokunbi G, Carmona A, Gould W, Konopitski A, Brogle P. Remote Monitoring After Same-Day Total Joint Arthroplasty Reduces Hospital Readmissions. Abstract in International Journal of Academic Medicine. Oct-Dec 2023.

11. Sharma A, Fletcher AN, Shah JK, Akoh CC, Parekh SG. The Effect of Thursday Night Football on Injuries in the National Football League. Journal of Orthopaedics and Sports Medicine. 5 (2023): 304 - 310.

12. Chopra A, Anastasio AT, Fletcher AN, Tabarestani TQ, Sharma A, Parekh SG. Short- Term Outcomes of Jones-Specific Implant Versus Intramedullary Screw and Plate Fixation for Proximal Fifth Metatarsal Fractures. J Foot Ankle Surg. 2023 May 19:S1067-2516(23)00121-7.

13. Mike-Mayer AB, Sakthivelnathan V, Sharma A, Panchbhavi VK, Chen J. Patient Perceptions of Surgeon Reimbursement in Total Ankle Arthroplasty. Foot Ankle Spec. 2023 Jul 14.

14. Sharma A, Parekh SG. Clinical viability of novel safety-engineered sharps device in wound closure for foot and ankle surgery. Nat J Clin Orthop 2023;7(2):31-35.

15. Konopitski A, Chielozor O, Smith B et al. Evolution of Total Hip Arthroplasty in Patients Younger than 30 Years of Age: A Systematic Review and Meta-Analysis. Archives of Orthopaedic and Trauma Surgery. 2023.

Unveiling the Journey: Insights from our 1st Research Fellow

Robert Gomez, MD

Holding the title of Research Fellow within the Department of Orthopaedic Surgery at St. Luke's has been an invaluable experience. This position has allowed me to hone my organizational skills and provided opportunities to connect with professionals both within and outside the department while deepening my orthopaedic knowledge. At St. Luke's, I actively collaborated with residents and attending surgeons on a diverse range of research projects. This included biomechanical studies on nails used for femur fracture fixation, practice variability of pediatric fracture management, and prospective studies aiming to optimize patients for surgery and prevent complications such as acute kidney injury. This collaboration resulted in the creation of abstracts accepted at national meetings and manuscripts submitted to peer-reviewed journals. This experience has been instrumental in broadening my research skills, including my understanding of study design, statistical analysis, and improving my scientific reading and writing.

The environment at St. Luke's has provided opportunities to participate in projects with multidisciplinary teams, including other specialty care teams, the local IRB office, and the Clinical Trials Office. These collaborations result in the appropriate implementation of study protocols, which support both patient care and research. These interactions have played a pivotal role in my professional and personal growth as a physician.

My tenure as the Research Fellow has been rewarding, providing me opportunities to mentor medical students and actively participate in resident education through didactics, journal clubs, and cadaveric labs. The position has provided a well-rounded experience that has supported my professional growth and provided person fulfillment, better preparing me to excel as an orthopaedic resident. It is a role I wholeheartedly recommend for those interested in expanding their orthopaedic knowledge and actively engaging in research.

Resident Abstract

An Analysis of Dual Fellowship Rates Among Orthopaedic Trauma Surgeons

Juan Tio-Pagan, MD[1], Jonathan D McKeeman, MD, MBA[1], Akhil Sharma, MD[1], John J Harrast, MS[2], David F Martin, MD[3], Dustin A Greenhill, MD[1], Douglas W Lundy, MD, MBA[1]
[1]Department of Orthopaedic Surgery, St. Luke's University Health Network, Bethlehem, PA
[2]Data Harbor Solutions, Chicago, IL
[3]Department of Orthopaedic Surgery, Wake Forest University School of Medicine, Winston-Salem, NC

Abstract

Purpose: An increasing number of orthopaedic trainees opt to complete more than one fellowship. This study aims to analyze the current trends and possible moving patterns associated with orthopaedic surgeons who completed a fellowship in orthopaedic trauma surgery.

Methods: The American Board of Orthopaedic Surgery (ABOS) Part II applicant database was utilized. Candidates sitting for the exam between 2007-2009 (early years) and 2017-2019 (recent years) were evaluated. Military and foreign candidates were excluded to limit applicants with less access to dual fellowships and/or those who were mid-to-late career surgeons. Only those orthopaedic surgeons who completed a fellowship were considered for the analysis. Comparisons between outcomes were conducted using a Student's t-test, Fishers exact test, and a chi- squared test.

Results: Among 3,246 fellowship- trained applicants for ABOS Part II, 301 (9.3%) completed an orthopaedic trauma surgery fellowship and 180 (5.5%) completed more than one fellowship. Among orthopaedic surgeons who first completed a fellowship in orthopaedic trauma, none did a second fellowship. However, trauma was the second most popular additional fellowship (37% of dual-fellowship trained surgeons). Orthopaedic trauma surgeons only relocated before Part II at a rate of 8.6% and this was not statistically different from the other fellowship subspecialties ($p = 0.147$).

Conclusion: There is a low likelihood that surgeons who first complete an orthopaedic trauma fellowship will complete a second fellowship, but orthopaedic trauma is a popular second fellowship.

Level of Evidence: IV

Table 1: Passing Frequency across moving status within the trauma surgeon population.

Factor	Trauma Fellows	2007-2009	2017-2019	p-value
N	**301**	**106**	**195**	
Moved?				0.40
no	275 (91.36%)	99 (93.40%)	176 (90.26%)	
yes	26 (8.64%)	7 (6.60%)	19 (9.74%)	
Number of Moves				0.40
0	275 (91.36%)	99 (93.40%)	176 (90.26%)	
1	17 (5.65%)	5 (4.72%)	12 (6.15%)	
2	7 (2.33%)	1 (0.94%)	6 (3.08%)	
3	1 (0.33%)	0 (0.00%)	1 (0.51%)	
5	1 (0.33%)	1 (0.94%)	0 (0.00%)	
Number of Times Moved				0.60
None	275 (91.36%)	99 (93.40%)	176 (90.26%)	
Once	17 (5.65%)	5 (4.72%)	12 (6.15%)	
Twice	7 (2.33%)	1 (0.94%)	6 (3.08%)	
Three or More Times	2 (0.66%)	1 (0.94%)	1 (0.51%)	

Resident Abstract

Concussions in Operative Orthopaedic Trauma Patients: A Prospective Observational Study

Nathan W. White[1], Akhil Sharma[1], Timothy Renzi[1], Vincenzo Bonaddio[2], Henry Boateng[2], Chinenye Nwachuku[1]
[1]St. Luke's University Health Network, Bethlehem, PA, [2]Penn State Milton S. Hershey Medical center, Hershey, PA

Abstract

Introduction: Concussions are defined as a traumatic injury to the brain resulting in neurological symptoms without radiological findings.2 While these injuries have been extensively explored in the sports literature, little has been written regarding concussions associated with orthopaedic trauma.1-8 This study sought to determine the incidence of red flag concussion symptoms (as described in the SCAT5 concussion assessment tool) in orthopaedic trauma patients and determine if these symptoms at presentation were associated with worse social and/or functional outcomes.

Methods: Consecutive adult (>18 years old) trauma patients with operative orthopaedic injuries admitted to a level 1 trauma center were prospectively enrolled from August 2020 to December 2022. Exclusion criteria included those with a Glascow coma scale < 13, intracranial injury, pregnant or incarcerated patients, inability to comply with phone follow-up, and non-English speaking patients. Follow-up surveys were obtained by phone at the following time points: 2 weeks, 6 weeks, 3 months, and 6 months. The presence of ≥1 red flag symptom was considered a dichotomous independent variable (symptomatic or asymptomatic). Return to work by six months post-injury and patient-reported resumption of pre-injury ambulatory status were the recorded outcomes. Chi-square and Student's t-tests were performed for categorical and continuous data, respectively.

Results: Among 83 enrolled patients, a 63% retention rate at 6 months yielded a final study population of 51 patients. There were no differences between symptomatic versus asymptomatic patients with regards to age, injury type, or injury severity. (Table 1) The proportion of symptomatic patients declined from 45% initially to 27.5% at two weeks. After six months, 60.8% of participants returned to work. Concussive symptomatology at presentation did not predict eventual return to work (56.5% symptomatic versus 64.3% asymptomatic, p=0.896); however, concussive symptomatology present at 2 weeks follow up was a significant predictor of return to work (35.7% symptomatic versus 70.2% asymptomatic, p <0.05). At no screening time point were there significant differences in rates of patient-reported return to pre-injury ambulatory status throughout the study period.

Conclusion: Nearly half of operative orthopaedic trauma patients present with at least one symptom of a mild traumatic brain injury. The presence or absence of concussive symptoms at initial presentation did not predict eventual return to work. However, the persistence of at least one red flag symptom at 2 weeks had statistically significant association with failure to return to work. Moreover, in contrast to return to work, recovery of ambulatory status was similar among initially symptomatic versus asymptomatic participants at all time points. This finding suggests that the issue of return to work may be more complex than the musculoskeletal pathology encountered in orthopaedic trauma. Early identification of red flag concussive symptoms may help identify which patients are at risk for posttraumatic unemployment and may require additional services beyond their fracture care to assist with recovery.

Level of Evidence: IV

Table 1.1 Demographics of patients with and without red flag concussion symptoms at initial presentation and 2 week follow up time points.

	Total N for Category	Red Flag Symptoms Initial Intake	No Red Flag Symptoms Initial Intake	P-Value	Red Flag Symptoms 2 Week Follow Up	No Red Flag Symptoms 2 Week Follow Up	P-value
Loss to Follow Up	32	34.4%	41.2%	0.54			
Age (Years)	51	43.9	46.2	0.58	43.4	45.9	0.58
Sex (Male)	35	47.6%	83.3%	< 0.05	57.1%	73.0%	0.28
Multiply Injured Patients	23	38.1%	50.0%	0.40	50.0%	43.2%	0.67
Positive Concussion History	20	47.6%	33.3%	0.30	42.9%	37.8%	0.74
Initial Employment Rate	40	66.7%	86.7%	0.09	78.6%	78.4%	0.67

Resident Abstract

Efficacy of Liposomal Bupivacaine in Managing Postoperative Pain in Foot and Ankle Surgeries: A Prospective Randomized Blinded Controlled Study

Brendan Smith, MD[1], Anna Ng-Pellegrino, MD[2], Ajith Malige, MD[1], Jonathan McKeeman, MD[1], Rebecca Bates, BS[3], Jill Stoltzfus, PhD[1], James Lachman, MD[1]

[1]Department of Orthopaedic Surgery, St. Luke's University Health Network, Bethlehem, PA, [2]Department of Anesthesiology, St. Luke's University Health Network, Bethlehem, PA, [3]Temple Medical School, St. Luke's Campus, Bethlehem, PA

Abstract

Introduction/Purpose: Surgeons' response to the nationwide opioid epidemic has included using alternatives to narcotic pain medications. Regional anesthesia has provided options to reduce narcotic consumption after surgery. Liposomal Bupivacaine (LB) is not FDA approved for use in nerve blocks in the lower extremity, even though it is approved for use in upper extremity blocks (interscalene). The literature on LB in foot and ankle surgery has been limited to local infiltration by surgeons, and no major study has explored its efficacy when used in lower extremity peripheral nerve blocks. In this study, we compare local LB infiltration with LB used in peripheral nerve blocks in the lower extremity and compare both of these techniques with the current standard of care, a non-LB peripheral nerve block.

Methods: All patients undergoing surgery in a single surgeon foot and ankle practice were enrolled in this IRB approved, prospective, randomized, single blinded controlled study. Patients having surgery between March 2022 – January 2023 were randomized to one of three study arms: ultrasound-guided (US) nerve block with local anesthetic only, US -guided nerve block with LB/local mix, or infiltrative field block with LB/local mix. The primary outcomes collected included the amount of narcotic pain medication required in the post anesthesia care unit (PACU) up until post-operative day (POD) 4. Secondary measured outcomes include opioid consumption measured by oral morphine equivalents (OME), PROMIS scores (Pain Interference, Physical function, Depression) and subjective duration of nerve block as reported by the patient. Collection was obtained via chart review from hospital EMR, and phone calls made to patients during specific time intervals after surgery.

Results: After exclusion of 56 patients, 248 patients met inclusion criteria. Seventy underwent popliteal or popliteal/adductor block with local only (Group 1), 98 underwent popliteal or popliteal/adductor block with LB/local mix (Group 2), and 80 underwent surgeon administered local field block with LB/local mix (Group 3). Median PACU OME was lower for the local peripheral block when compared to the LB/local peripheral block and the field block group (Median OME 0 vs. 0 and 7.5 OME, $p = 0.017$). Postoperative opioid requirements up until POD 4 were significantly lower in the LB/local peripheral block group compared to the local only peripheral block group (Median OME 48.75 vs 30 OME and 37.5 OME, $p < 0.001$). Duration of block effect was significantly higher in the LB peripheral nerve block compared to Groups 1 and 3 ($p < 0.001$).

Conclusion: Preoperative peripheral perineural blocks (popliteal/adductor) containing a mix of LB and local anesthetic significantly reduce postoperative narcotic use in patients undergoing outpatient foot and ankle surgery when compared to perineural blocks without LB. The duration of effect of perineural block is significantly extended with addition of LB to the block mixture, and significantly longer than local infiltration of LB by the surgeon. Consideration should be given to the use of LB blocks in foot and ankle surgical procedures to reduce patient postoperative narcotic requirements.

Level of Evidence: Clinical Trial Level II

Table 1: Study Results

	Group 1 (Regional block without LB) **(n = 70)**	**Group 2** (Regional block with LB) **(n = 98)**	**Group 3** (Surgeon infiltration of LB) **(n = 80)**	**p-value***
Gender (n,%)	39 female (55.7%) 31 male (44.3%)	58 female (59.2%) 40 male (40.8%)	41 female (51.2%) 39 male (48.8%)	.570
BMI (mean ± SD)	31.77 ± 6.85	33.07 ± 7.05	30.95 ± 7.05	.127
Smoking Status (n,%)	No: 40 (57.1%) Yes: 6 (8.6%) Previous: 24 (34.3%)	No: 55 (56.1%) Yes: 10 (10.2%) Previous: 33 (33.7%)	No: 50 (62.5%) Yes: 7 (8.8%) Previous: 23 (28.7%)	.918
Diabetes (n,%)	3 (4.3%)	8 (8.2%)	8 (10.0%)	.410
ASA Classification (n,%)	1: 8 (11.4%) 2: 42 (60.0%) 3: 20 (28.6%) 4: 0	1: 10 (10.3%) 2: 57 (58.8%) 3: 29 (29.9%) 4: 1 (1.0%)	1: 13 (61.3%) 2: 46 957.5%) 3: 21 (26.3%) 4: 0	.793
Procedure (n,%)	Ankle: 36 (51.4%) Forefoot: 15 (21.4%) Hindfoot: 15 (21.4%) Midfoot: 4 (5.7%)	Ankle: 48 (49.0%) Forefoot: 18 (18.4%) Hindfoot: 23 (23.5%) Midfoot: 9 (9.2%)	Ankle: 31 (38.8%) Forefoot: 22 (27.5%) Hindfoot: 15 (18.8%) Midfoot: 12 (15.0%)	.321
Revision/Prior Surgery (n,%)	9 (12.9%)	19 (19.4%)	11 (13.8%)	.436
Acute Trauma (< 4 Weeks) (n,%)	32 (45.7%)	33 (33.7%)	36 (45.0%)	.188
90-Day Readmission (n,%)	2 (2.9%)	4 (4.1%)	5 (6.3%)	N/A (imbalanced subgroups)
Weight Bearing After Surgery (n,%)	WBAT: 18 (25.7%) NWB: 47 (67.1%) PWB: 5 (7.1%) TTWB: 0	WBAT: 25 (25.8%) NWB: 71 (73.2%) PWB: 1 (1.0%) TTWB: 0	WBAT: 22 (27.5%) NWB: 53 (66.3%) PWB: 4 (5.0%) TTWB: 1 (1.3%)	N/A (imbalanced subgroups)
PACU OME (median, range)	0 (0 – 57.5)	0 (0 – 67.5)	7.5 (0 – 102)	**.017**
Number of Opioid Pills Taken POD 1-4 (median, range)	6.5 (0 – 26)	4 (0 – 21)	5.5 (0 – 64)	**.025**
Length of Block (Days) (median, range)	1.25 (0.42 – 2.5)	3 (1 – 7)	1.5 (0.04 – 3.0)	**< .001**
Length of Block (Hours) (median, range)	30 (10 – 60)	72 (24 – 168)	36 (1 – 72)	**< .001**
Daily Average OME POD 1-4 (median, range)	48.75 (0 – 195)	30 (0 – 157.5)	37.5 (0 – 480)	.011

**Based on separate one-way analysis of variance (ANOVA), Kruskal Wallis tests, or chi square tests, as appropriate; p < .05 denotes statistical significance, with no adjustment for the multiple comparisons.*

Resident Abstract

Readmission Rates in Anemic Patients Following Total Joint Arthroplasty

Timothy Renzi, MD[1], Gabriel De Leon, MD[1], Robert Gomez, MD[1], David Ramski, MD[1], Kristofer Matullo, MD[1]
[1]Department of Orthopaedic Surgery, St. Luke's University Health Network, Bethlehem, PA

Abstract

Introduction: The specific relationship between anemia and readmission rates in patients undergoing total hip (THA) and knee arthroplasty (TKA) is not well-defined. Understanding the impact of postoperative anemia on readmission rates following total joint arthroplasty is crucial for optimizing patient outcomes and healthcare resource utilization. We aimed to explore the relationship between changes in hemoglobin following THA and TKA with rates of readmission, complications, and length of stay (LOS).

Methods: A retrospective review of THA or TKA performed between January 2018 and December 2022 was conducted to assess the change in hemoglobin from preoperative to postoperative day one values (ΔHb). Changes in hemoglobin were compared between those readmitted at 30-, 60-, and 90-days versus those who were not readmitted. Additionally, the same groups were compared for postoperative complications, which include revision arthroplasty. Furthermore, an analysis was conducted to assess for direct correlation between ΔHb and LOS following the index procedure. Statistical significance was defined as $p < 0.05$.

Results: A total of 3000 patients (1500 THA and 1500 TKA) were identified. For patients with a THA, no differences were seen in ΔHb between those who were readmitted at 30-, 60-, or 90-days as well as those who experienced postoperative complications, including revision surgery (Table 1). Similarly, in the TKA group, there were no significant differences between ΔHb and readmissions at 30- and 60-days or postoperative complications. Conversely, a significant difference was found in ΔHb and 90-day readmission (-2.04 g/dL in readmitted patients versus -1.78 g/dL in those not readmitted, p=0.034) (Table 2). No correlation was seen between ΔHb and LOS following THA or TKA.

Conclusion: An increased ΔHb after TKA was associated with higher 90-day readmission rates. While further clinical relevance of this finding warrants validation, it may be an objective variable that helps risk stratify postoperative patients and prevent potential readmissions.

Level of Evidence: Level III Retrospective Cohort

Table 1: Assessment of patients who underwent THA

Outcomes (n = 1500)	ΔHb (mean, SD)	p-value
30-Day Readmissions		
Yes (n = 110)	-2.14 (1.44)	.804
No (n = 1390)	-2.17 1.49)	
60-Day Readmissions		
Yes (n = 165)	-2.18 (1.51)	.961
No (n = 1335)	-2.17 (1.49)	
90-Day Readmissions		
Yes (n = 215)	-2.09 (1.47)	.317
No (n = 1285)	-2.19 (1.49)	
Perioperative Complications		
Yes (n = 151)	-2.18 (1.47)	.641
No (n = 1349)	-2.12 (1.69)	
Revisions		
Yes (n = 34)	-2.08 (1.37)	.714
No (n = 1466)	-2.17 (1.49)	
	Spearman's Rank Correlation Coefficient	**p-value**
Length of Stay	-.035	.177

Table 2: Assessment of patients who underwent TKA

Outcomes (n = 1500)	ΔHb (mean, SD)	p-value
30-Day Readmissions		
Yes (n = 71)	-2.08 (1.42)	.074
No (n = 1429)	-1.79 (1.31)	
60-Day Readmissions		
Yes (n = 100)	-2.04 (1.33)	.070
No (n = 1400)	-1.79 (1.32)	
90-Day Readmissions		
Yes (n = 129)	-2.04 (1.40)	**.034**
No (n = 1371)	-1.78 (1.31)	
Perioperative Complications		
Yes (n = 106)	-2.01 (1.48)	.092
No (n = 1394)	-1.79 (1.30)	
Revisions		
Yes (n = 20)	-2.03 (1.48)	.447
No (n = 1480)	-1.80 (1.32)	
	Spearman's Rank Correlation Coefficient	**p-value**
Length of Stay	.023	.368

Resident Abstract

Does a Patient's Ability To Localize their Pain Improve Outcomes and Decrease Cost? A Prospective Cohort Study

Akhil Sharma, MD[1], Ryan De Leon, MD[1], Ajith Malige, MD[1], James R. Lachman, MD[1]
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Abstract

Introduction: A patient's ability to accurately pinpoint subjective symptoms may enhance clinically objective output. The purpose of this study is to determine if the ability to localize symptoms is associated with improved outcomes.

Methods: Prospective enrollment was offered to consecutive new outpatients presenting to a fellowship-trained foot and ankle surgeon throughout a one-year study period. Patients ≥ 18 years old who provided their own history and had a chief complaint at or distal to the ankle were offered enrollment. Patients with acute fractures were excluded. At the initial visit, patient demographics and their ability to pinpoint their symptom(s) were recorded (yes/no). Patient-Reported Outcomes Measurement Information System (PROMIS) scores were obtained at the initial visit. Diagnostic interventions throughout their treatment course were documented.

Results: Among 361 patients, 295 (82%) patients could pinpoint symptoms (group 1) and 66 (18%) could not (group 2). The most common pathologies affected the tibiotalar joint, forefoot, and hindfoot. Patients with diabetes (odds ratio=3.00) or a smoking history (odds ratio=1.46) were less likely to pinpoint their symptoms. Compared to patients who can pinpoint symptoms, patients who were unable to pinpoint symptoms presented with similar PROMIS scores in the physical function domain (46.9 versus 50.6, $p = 0.234$) but increased pain (53.1 versus 47.2, $p = 0.048$) and depression scores (50.2 versus 43.2, $p = 0.024$). Patients in group 2 were more likely to have further imaging ordered (including CT, MRI, and EMG) ($p=0.003$), diagnostic testing ($p=0.004$), or undergo operative intervention for their pathology ($p=0.032$). Group 2 patients were also instructed to follow up at longer time intervals (7.5 versus 6.7 weeks, $p = 0.008$).

Conclusion: One out of every five patients who present to a foot and ankle orthopaedic clinic is not able to pinpoint his or her symptoms. A history of smoking or diabetes may decrease patient ability to pinpoint their symptoms. Patients unable to pinpoint foot and ankle symptoms have a higher likelihood of undergoing advanced imaging, diagnostic testing, and operative intervention. Patients unable to pinpoint their pain also present with worse mental health and have longer follow up intervals. This information can help surgeons counsel patients who cannot pinpoint symptoms about their clinical situation and associated outcomes.

Level of Evidence: III

Table 1: Assessment PROMIS Score Comparison

Pinpoint (Yes/No)	PROMIS Score	p-value
	Physical function	
Yes	50.6	0.234
No	46.9	
	Pain Interference	
Yes	47.2	0.048
No	53.1	
	Depression	
Yes	43.2	0.024
No	50.2	

Resident Abstract

Do Half of Orthopaedic Surgeons Really Change Jobs within their First Two Years? An Analysis of Early Practice Changes Using the American Board of Orthopaedic Surgery Database

Akhil Sharma, MD[1]; Jonathan D. McKeeman, MD, MBA[1]; Dustin A. Greenhill, MD[1]; John J. Harrast, MS[2]; David F. Martin, MD[3]; Douglas W. Lundy, MD, MBA[1]

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Abstract

Introduction: There is a tenet in our profession that 50% of newly minted orthopaedic surgeons leave their first job within their first two years of practice. However, there is no literature to support this claim. Moreover, there are several disincentives that prevent surgeons from changing practices within their first two years. The purpose of this study is to determine the rate of early career orthopaedic surgeon turnover among board eligible orthopaedic surgeons using the American Board of Orthopaedic Surgery (ABOS) database.

Methods: Among candidates taking the ABOS Part II Oral Examination in the years 2007–2009 and 2017–2019, the ABOS database was queried for each surgeon's practice information (between residency graduation and the Part II exam), fellowship training, and exam subspecialty. Surgeons who trained outside of the U.S. as well as surgeons with military obligations were excluded from the analysis. Candidate variables were analyzed according to whether or not the surgeon did or did not move practice locations.

Results: Among 4,151 total applicants, 3,784 orthopaedic surgeons met inclusion criteria and only 228 candidates (6.0%) changed practice locations one or more times prior to sitting for the ABOS Part II exam. Overall, only 198 (5.2%) surgeons moved practice locations within the first two years of reporting their first practice location. On average, candidates sat for the Part II exam 3.2±1.1 (range 2-32) years after their residency graduation with 76% being traditional candidates who took Part II within two years of becoming board-eligible. (Table 1) Longer durations between graduating residency and taking ABOS Part II were associated with more practice changes ($p < 0.001$).

Discussion and Conclusion: The proportion of ABOS board-eligible orthopaedic surgeons who leave their first job within their first two years of practice appears to be far less than what is casually publicized. This finding is pertinent because the majority of practicing orthopaedic surgeons in the U.S. become ABOS certified early in their career. Moreover, early practice changes were associated with a non-traditional (delayed) timeline between residency graduation and ABOS Part II. This information can help graduating orthopaedic surgeons, practice managers, and leaders within our field anticipate short-term continuity or practice changes.

Level of Evidence: IV

Table 1: Practice Changes per Part II Exam Subspecialty

	Moved?		
	No	Yes	Total
Adult Reconstruction	366 (95.6%)	17 (4.4%)	383
Foot & Ankle	208 (94.5%)	12 (5.5%)	220
General Orthopaedics	1115 (92.6%)	89 (7.4%)	1204
Hand & Upper Extremity	549 (95.6%)	25 (4.4%)	574
Oncology	40 (93.0%)	3 (7.0%)	43
Pediatrics	174 (96.1%)	7 (3.9%)	181
Shoulder & Elbow	55 (98.2%)	1 (1.8%)	56
Spine	374 (94.2%)	23 (5.8%)	397
Sports	455 (93.8%)	30 (6.2%)	485
Trauma	220 (91.3%)	21 (8.7%)	241
Total	3556 (94.0%)	228 (6.0%)	3784

Resident Abstract

Intraoperative Periprosthetic Fracture Rate in Elderly Patients Undergoing Hip Hemiarthroplasty: A Comparison of Uncemented and Cemented Stems

Michael J. DeRogatis, MD, MS[1], Robert Gomez, MD[1], Margaret Higgins, MD[1], Paul S. Issack, MD, PhD[2], Douglas Lundy, MD, MBA[2]

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[2]New York Presbyterian Hospital, 170 William Street, New York, NY 10038

Abstract

Introduction: There is controversy over whether hemiarthroplasty for displaced geriatric femoral neck fractures should be performed with or without cement. While both techniques have equivalent outcomes in terms of pain relief and revision rates, uncemented implants have been shown to have a high rate of periprosthetic femur fractures (PFFs). However, many studies comparing cemented and uncemented implants have used a tapered-wedge stem design, which may create a wood-splitter effect in osteoporotic bone. A fit-and-fill stem design may be safer to implant in terms of fracture risk in this population. This study's purpose was to determine the periprosthetic fracture rate of three hemiarthroplasty designs used for geriatric hip fractures: cemented, uncemented fit-and-fill, and uncemented tapered-wedge.

Methods: This was a multicenter, retrospective study involving 718 patients with a displaced femoral neck fracture who underwent treatment with either uncemented or cemented hemiarthroplasty between 2014 and 2022. Inclusion criteria comprised patients aged ≥70 years treated with a fit-and-fill stem, tapered wedge stem, or a cemented stem, while those undergoing total hip arthroplasty, revision procedures, and/or presenting with an acetabular fracture were excluded. Analysis of variance and chi-squared tests were employed, with statistical significance set at $p < 0.05$. The primary outcome was incidence of intraoperative periprosthetic femur fractures (PFF).

Results: Among the 718 patients, 59 intraoperative fractures were identified. Across cohorts, no differences were observed in age, body mass index, American Society of Anesthesiology score, length of stay, 30-day mortality, or laterality. However, patients treated with a tapered wedge stem had a significantly higher incidence of intraoperative fracture compared to those treated with fit-and-fill stems (9.7% vs. 5.0%, $p = 0.038$). No significant differences were found when comparing fit-and-fill with cemented stems (5.0% vs. 9.8%) or tapered wedge with cemented stems (9.7% vs 9.8%). Patients treated with a tapered wedge stem were found to have two times greater odds of experiencing an intraoperative fracture compared to those treated with a fit-and-fill stem (OR = 2.05, 95% CI 1.03-4.09).

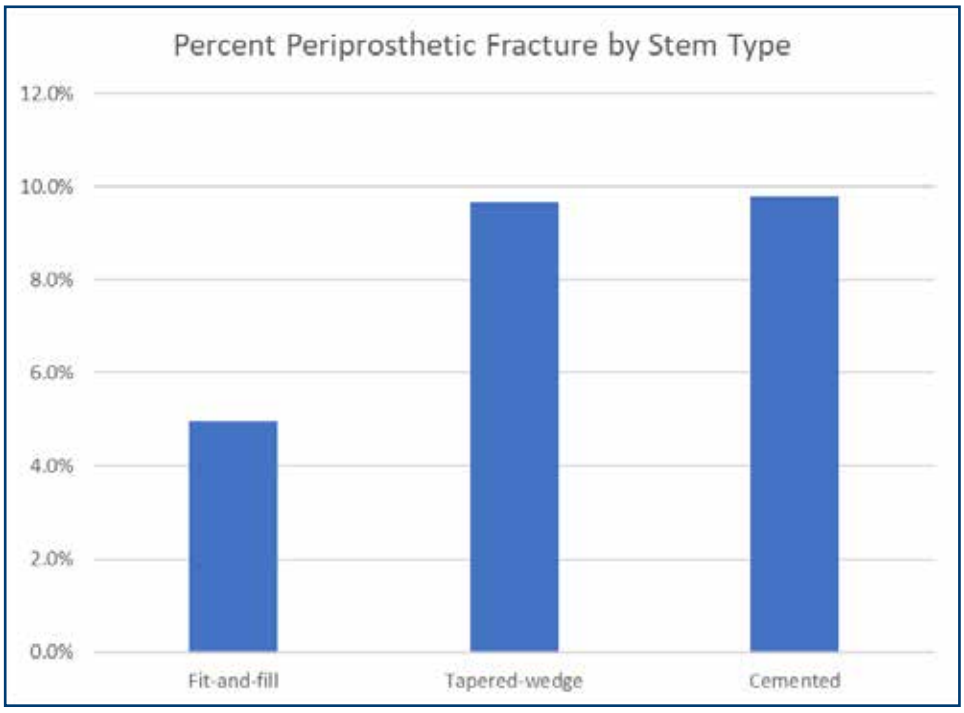
Discussion and Conclusion: These findings demonstrate an association between implant design and periprosthetic femur fractures after hip hemiarthroplasty in geriatric patients. In this study, uncemented fit-and-fill stems were associated with a lower incidence of periprosthetic femur fractures than tapered-wedge designs but not cemented stems. By contrast, this study was not powered nor designed to universally support uncemented over cemented hip hemiarthroplasty. When a surgeon opts to utilize an uncemented stem during hip hemiarthroplasty in a geriatric patient, PFF risk may be decreased by choosing a fit-and-fill (rather than a tapered-wedge) design.

Level of Evidence: Therapeutic Level III

Figure 1. Photographs of Secur-Fit, a proximally coated fit-and-fill femoral stem design (Stryker, Mahwah, NJ, USA).

Figure 1. Photographs of Corail, a tapered-wedge femoral stem design (Depuy; Raynham, MA, USA).

Figure 3. Percent periprosthetic fracture by stem type.



Resident Abstract

The Efficacy of Ultrasound Guided Supraclavicular Nerve Blocks with Liposomal Bupivacaine in Managing Postoperative Pain for Finger, Hand, Wrist and Elbow Surgery: A Prospective Randomized Controlled Study

Samantha N Weiss, MD; Robert W Gomez, MD; Karolina Fedoryszak, NP; Anna Ng-Pellegrino, MD; Kristofer S Matullo, MD

Abstract

Introduction: Common modalities for postoperative pain control in upper extremity surgery include surgeon infiltration or ultrasound guided regional nerve blocks. For finger, hand, wrist, and elbow procedures, liposomal bupivacaine (LB) has the potential to prolong ultrasound guided supraclavicular nerve blocks (SCNB). This study examines the effect of SCNB with LB on postoperative pain control.

Methods: This is a prospective, randomized, controlled trial conducted from May 2023-February 2024 with three cohorts of ultrasound-guided SCNBs: local anesthetic only (Group 1; N=17); local anesthetic mixed with dexamethasone (Group 2; N=15); and local anesthetic mixed with LB (Group 3; N=17). Inclusion criteria are patients aged ≥18 years that are undergoing: ORIF of the finger, hand, wrist, or elbow; thumb interpositional arthroplasty; proximal row carpectomy, scaphoid excision and four-corner arthrodesis; and Dupuytren's excision. The primary endpoint was subjective block duration (hours). Secondary endpoints include opioid use after surgery, measured as oral morphine equivalents (OME) from the immediate recovery period (PACU phase) through postoperative day (POD) 3, as well as Disabilities of the Arm, Shoulder, and Hand (DASH) Scores. For statistical analysis, Chi-squared testing was conducted for nominal variables, ANOVA testing for continuous variables, and Bonferroni for post hoc analysis.

Results: There were no significant differences in age, gender, or ASA score across all cohorts (Table 1). Group 3 reported longer block duration (56.0 hrs) when compared to Group 1 (23.8 hrs) and Group 2 (29.3 hrs), ($p < 0.001$) (Table 2). Group 3 patients had higher PACU opioid requirements (2.0 OME) than Group 1 (1.4 OME) or Group 2 (0.0 OME); however, this was not significant ($p=0.292$) (Table 2). Group 3 had similar opioid requirements through POD 3 (7.1 OME) when compared to Group 2 (7.3 OME), but lower opioid requirements than Group 1 (14.7 OME) ($p=0.108$) (Table 2). No differences in post-operative DASH scores were observed between the three study arms ($p = 0.585$) (Table 2). There were no adverse effects reported in any study arm.

Conclusions: SCNB with LB exhibited a significantly extended duration of postoperative analgesia, almost twice as long as SCNBs with dexamethasone. On average, patients in the LB cohort required additional opioid medications in the PACU compared to other cohorts, in line with LB's delayed time to onset. Conversely, SCNB with LB blocks trended toward lower opioid requirements following discharge through POD 3 when compared to local infiltration only. Although these data points did not achieve significance with the current sample size, our results are promising.

Table 1. Descriptive Statistics by Group

	Total N=49	Group 1 N=17	Group 2 N=15	Group 3 N=17	P-Value
Age [mean, (SD)]	57.9 (16.6)	62.2 (16.1)	61.9 (13.3)	50.2 (17.9)	0.058
Gender (%)					
Male	25 (49.0)	9 (52.9)	7 (46.7)	9 (52.9)	0.921
Female	24 (49.0)	8 (47.1)	8 (53.3)	8 (49.0)	
ASA [mean, (SD)]	2.3 (0.6)	2.4 (0.6)	2.2 (0.6)	2.2 (0.6)	0.473

Table 2. Analysis of Length of Block and Opioid Requirements by Group

	Total N=49	Group 1 N=17	Group 2 N=15	Group 3 N=17	P-Value
Length of Block, hrs [mean, (SD)]	36.7 (22.7)	23.8 (9.9)	29.3 (9.3)	56.0 (27.4)	**<0.001**
OME in PACU	1.4 (4.1)	2.1 (5.0)	0.0 (0.0)	2.0 (4.9)	0.292
OME from Discharge to POD 3	9.8 (11.9)	14.7 (14.0)	7.3 (11.3)	7.1 (8.8)	0.108
Total OME	11.2 (12.5)	16.8 (14.9)	7.3 (11.3)	9.1 (9.0)	0.067
DASH Score (post-op)	48.1 (30.6)	39.2 (28.6)	55.3 (34.9)	49.7 (29.8)	0.585

Table 3. Post Hoc Analysis by Group

Bonferroni Post Hoc		P-Value
Length of Block		
	Group 1 vs Group 2	1.000
	Group 1 vs Group 3	**<0.001**
	Group 2 vs Group 3	**<0.001**
OME in PACU		
	Group 1 vs Group 2	0.495
	Group 1 vs Group 3	1.000
	Group 2 vs Group 3	0.532
OME from Discharge to POD3		
	Group 1 vs Group 2	0.237
	Group 1 vs Group 3	0.181
	Group 2 vs Group 3	1.000
Total OME		
	Group 1 vs Group 2	0.095
	Group 1 vs Group 3	0.204
	Group 2 vs Group 3	1.000
DASH Score		
	Group 1 vs Group 2	0.940
	Group 1 vs Group 3	1.000
	Group 2 vs Group 3	1.000

Resident Abstract

Is There Still a Learning Curve for Primary Total Ankle Arthroplasty after Completing a High Volume Ankle Replacement Fellowship? A Multicentered Study

Margaret J. Higgins, MD[1], Grace DiGiovanni, MD[2], Jonathan D. McKeeman, MD/MBA[1], Samantha N. Weiss, MD[1], James R. Lachman, MD[1], Elizabeth Cody, MD[2]

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[2]Hospital for Special Surgery, New York, NY

Abstract

Introduction: Total ankle arthroplasty (TAA) has increased in popularity as an alternative to ankle arthrodesis for the treatment of end-stage ankle arthritis. The presence of a TAA learning curve is controversial, potentially because certain foot and ankle fellowship programs perform a high volume of TAAs. This study's purpose is to reexamine whether a surgeon learning curve for TAA exists.

Methods: A retrospective review was performed of consecutive patients ≥ 18 years old who underwent primary TAA for end stage ankle arthritis by one of two high volume fellowship-trained foot and ankle surgeons. Patients with < 2 years of follow-up were excluded. Pre-operative and post-operative radiographic, patient-reported, and clinical outcomes were analyzed. Patient-reported outcomes were derived from the Patient-Reported Outcomes Measurement Information System (PROMIS). The tibiotalar angle was recorded and considered positive for varus deformity. To determine if a learning curve affected operative parameters and clinical outcomes, the data was analyzed using the Moving Average Method.1 The learning curves for surgeon one and surgeon two were combined to create an overall curve for each variable assessed.

Results: Among 87 included patients, the average age (64.0 ±10.7 years), BMI (30.2 ±5.0 kg/m2), and the proportion of patients with diabetes mellitus (15%) did not differ among surgeons. PROMIS scores significantly improved in the pain domain (63.1 vs 53.6, $p<0.001$) and in the function domain for surgeon two only (38.6 vs 46.8, $p<0.001$). The change in tibiotalar angle was not significantly different between pre-operative and at final follow-up (1.98 vs 1.27, $p=0.49$). A learning curve was not evident with tourniquet time, but was present with regards to post-operative complications (Table 1 and Figures 1-2).

Conclusions: Although fellowship-trained foot and ankle surgeons are operatively efficient immediately after fellowship, there may still be a learning curve for primary TAA with respect to post-operative complications.

Level of Evidence: Level III

References:

1) Wei William W-S. Time series analysis. Addison Wesley Publ.;1994.

Table 1. Intra-Operative and Post-Operative Complication Rates

Variable	Surgeon One	Surgeon Two	Overall
Intra-Operative Complications	0/32 (0%)	4/55 (7.3%)	4/87 (4.8%)
Post-Operative Complications	13/41 (24%)	4/28 (12.5%)	17/87 (19.5%)
Radiographic Complications	1/32 (3.1%)	2/55 (3.6%)	3/87 (3.4%)

Figure 1. Overall Tourniquet Time Learning Curve

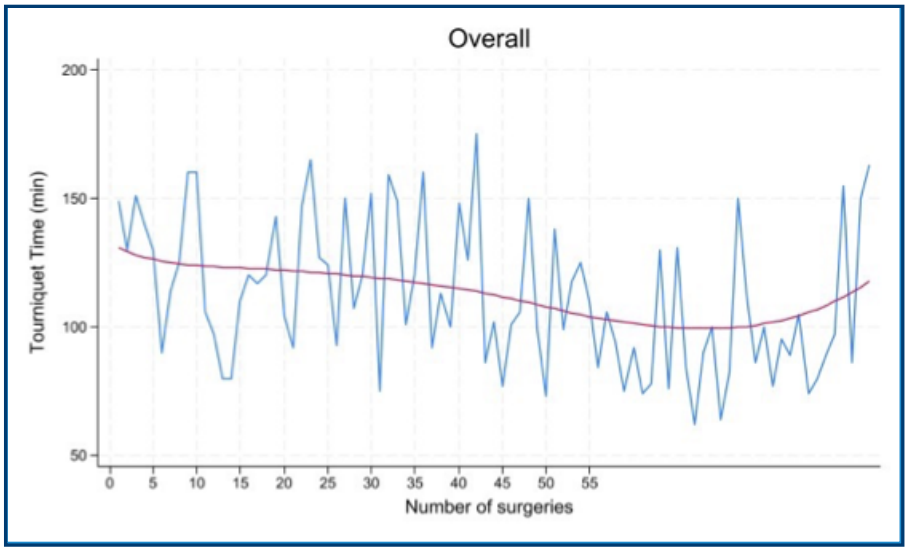
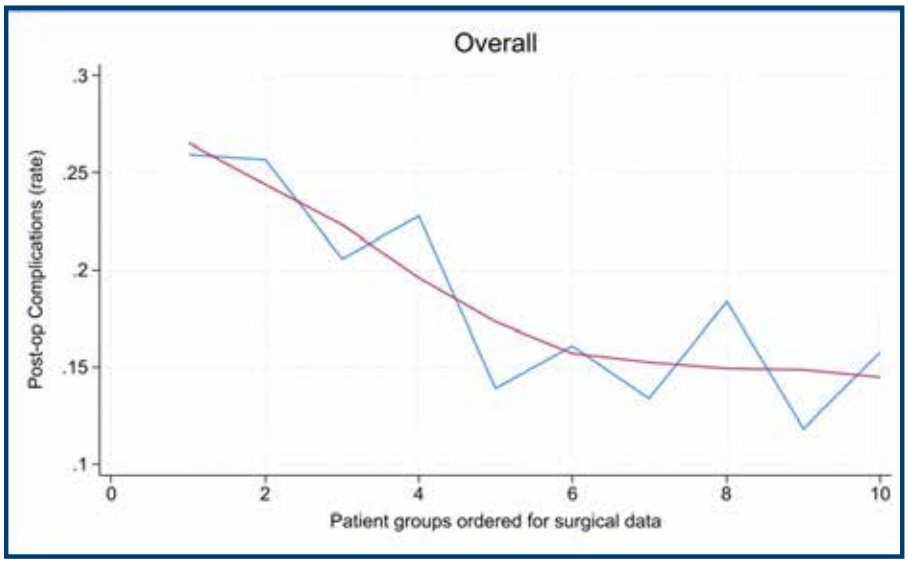


Figure 2. Overall Post-Operative Complications Learning Curve



Resident Abstract

Biomechanical Comparison of Cephalomedullary and Reconstruction Nails Used in the Treatment of Subtrochanteric Femur Fractures

Jonathan D. McKeeman, MD/MBA[1], Samantha N. Weiss, MD[1], Robert Gomez, MD[1], Michael Hast, PhD2, Chet Friday, BE[2], Margaret J. Higgins, MD[1], Douglas W. Lundy, MD[1]

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[2] University of Pennsylvania, Philadelphia, PA

Abstract

Introduction: The purpose of this study was to compare the biomechanical characteristics of two nail-composite femur models designed to simulate reconstructed unstable subtrochanteric femur fractures.

Methods: Eight composite femora were osteotomized to produce identical models of an unstable subtrochanteric femur fracture (OTA 32-C3.i). The simulated fractures were then fixed using either a DePuy Synthes TFN-ADVANCEDTM (TFNA) proximal femoral nailing system or the DePuy Synthes FRN-ADVANCEDTM (FRNA) femoral recon nailing system. The reconstructed fractures were all subjected to a compressive mechanical testing protocol consisting of cyclic loading and a destructive ramp-to-failure. Interfragmentary motion of the proximal and distal bone segments was tracked at multiple identical locations using 3D motion-capture techniques.

Results: The TFNA withstood a significantly higher maximum force (3512.5 N versus 3055.22 N, p=0.027) than the FRNA and the difference in energy to failure approached significance (35.6 J versus 18.30 J, p=0.050). The TFNA also exhibited higher magnitudes of proximal segment displacement at the greater trochanter (7.65 versus 4.72, p=0.045) but not at the distal segment (3.52 versus 2.62, p=0.205). There were no differences in overall construct stiffness (506.81 N/mm versus 409.74 N/mm, p=0.212). In all models, the implant underwent plastic deformation as the mode of failure.

Conclusions: In simulated unstable subtrochanteric femur fractures, the TFNA was both stronger and allows more proximal segment motion before failure when compared with the FRNA. Fracture site motion was the same, regardless of implant, which is clinically relevant when considering strain at a healing fracture.

Level of Evidence: Level III

Acknowledgements

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Figure 1

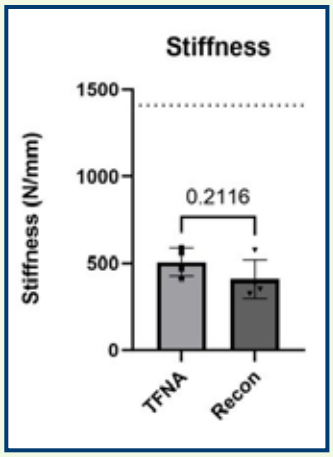


Figure 2

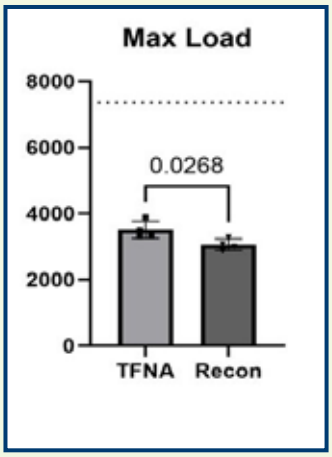
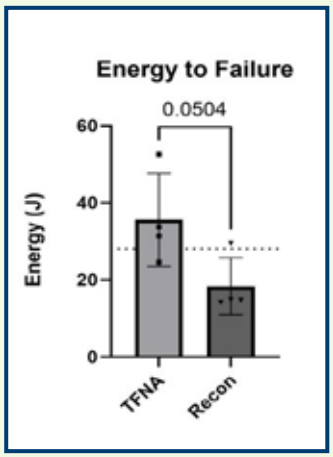


Figure 3



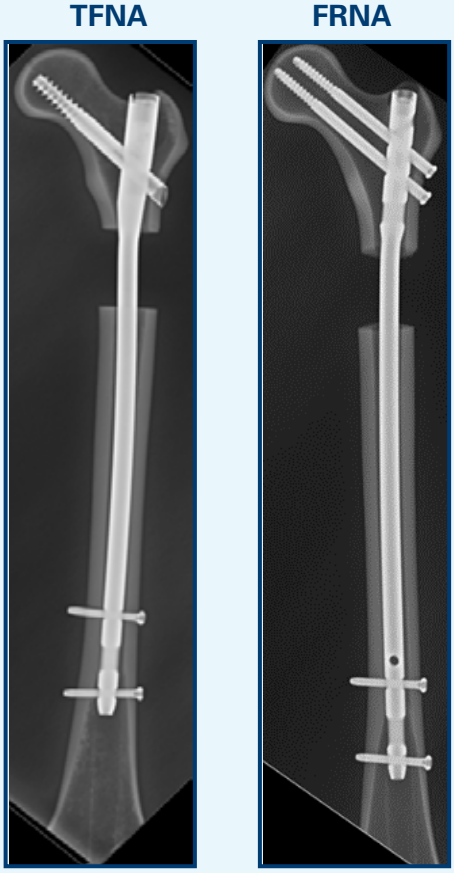


Table 1

FRNA		X-Translation	Y-Translation	Z-Translation	Translation Magnitude	X-Rotation	Y-Rotation	Y-Rotation
Greater Trochanter	Mean	3.87	1.87	1.72	4.72	0.68	0.68	2.37
	Std Dev	0.44	0.85	1.01	1.04	0.22	0.19	0.36
Distal Osteotomy	Mean	1.97	1.26	0.93	2.62	0.68	0.70	2.37
	Std Dev	0.38	0.69	0.44	0.53	0.22	0.21	0.36

Table 2

TFNA		X-Translation	Y-Translation	Z-Translation	Translation Magnitude	X-Rotation	Y-Rotation	Y-Rotation
Greater Trochanter	Mean	5.73	3.03	3.91	7.65	1.56	1.57	2.22
	Std Dev	1.57	0.85	0.92	1.71	0.51	1.10	0.54
Distal Osteotomy	Mean	1.48	2.64	1.65	3.52	1.55	1.58	2.21
	Std Dev	0.19	1.12	0.37	0.96	0.51	1.13	0.54

**Greater trochanter represents the sensor over the greater trochanter and distal osteotomy represents the sensor over the distal portion of the osteotomy both marked in red*

Resident Abstract

Effect of Orthopaedic Resident Surgical Participation on Surgical Case Length and Associated Cost

Robert W. Gomez, MD[1]; Douglas W. Lundy, MD[1]; Kristofer S. Matullo, MD[1]

[1]St. Luke's University Health Network, Bethlehem, PA

Abstract

Introduction: Resident surgical participation is fundamental to learning and is safe for patients. This study aimed to assess the impact of resident participation on operative times compared to procedures performed exclusively by attendings. Additionally, if resident involvement results in increased operative times, we aimed to understand the associated cost differences in surgical efficiency.

Methods: Operative data from a single academic teaching hospital from January 2020 to June 2023 were analyzed. All procedures were conducted by a single fellowship-trained orthopaedic hand surgeon, with or without resident participation. Assessed procedures included isolated endoscopic carpal tunnel release (ECTR), isolated trigger finger release (TFR), thumb carpometacarpal joint interpositional arthroplasty (CMC), and isolated de Quervain release (DeQ). Statistical differences were evaluated using independent t-tests to compare mean operative and room times. Relative value units, Medicare conversion factors, operative room costs, and the potential loss of additional cases were used to estimate the total cost to the hospital.

Results: A total of 1,057 surgical cases were identified, encompassing 686 ECTR, 284 TFR, 47 CMC, and 40 DeQ procedures with corresponding resident participation rates of 22.4%, 19.4%, 53.2%, and 25%, respectively. The mean operative time was significantly longer when residents were involved in ECTR (16 minutes and 49 seconds versus 12 minutes and 44 seconds, $p < 0.001$), TFR (11 minutes and 43 seconds versus 10 minutes and 11 seconds, $p = 0.004$), and CMC procedures (58 minutes and 35 seconds versus 44 minutes and 15 seconds, $p < 0.001$). No significant differences were found in mean operative and room times for DeQ procedures (18 minutes and 24 seconds versus 17 minutes and 6 seconds, $p = 0.472$). A secondary analysis, accounting for postgraduate level (PGY), demonstrated a significant difference between mean operative times for PGY-3 and PGY-5 residents in ECTR (17 minutes and 45 seconds versus 15 minutes and 40 seconds, $p < 0.001$) and TFR procedures (13 minutes and 6 seconds versus 10 minutes and 4 seconds, $p = 0.001$). No differences were observed between PGY-3 and PGY-5 residents in CMC or DeQ procedures. The estimated total cost to the hospital associated with resident involvement was $71,000.

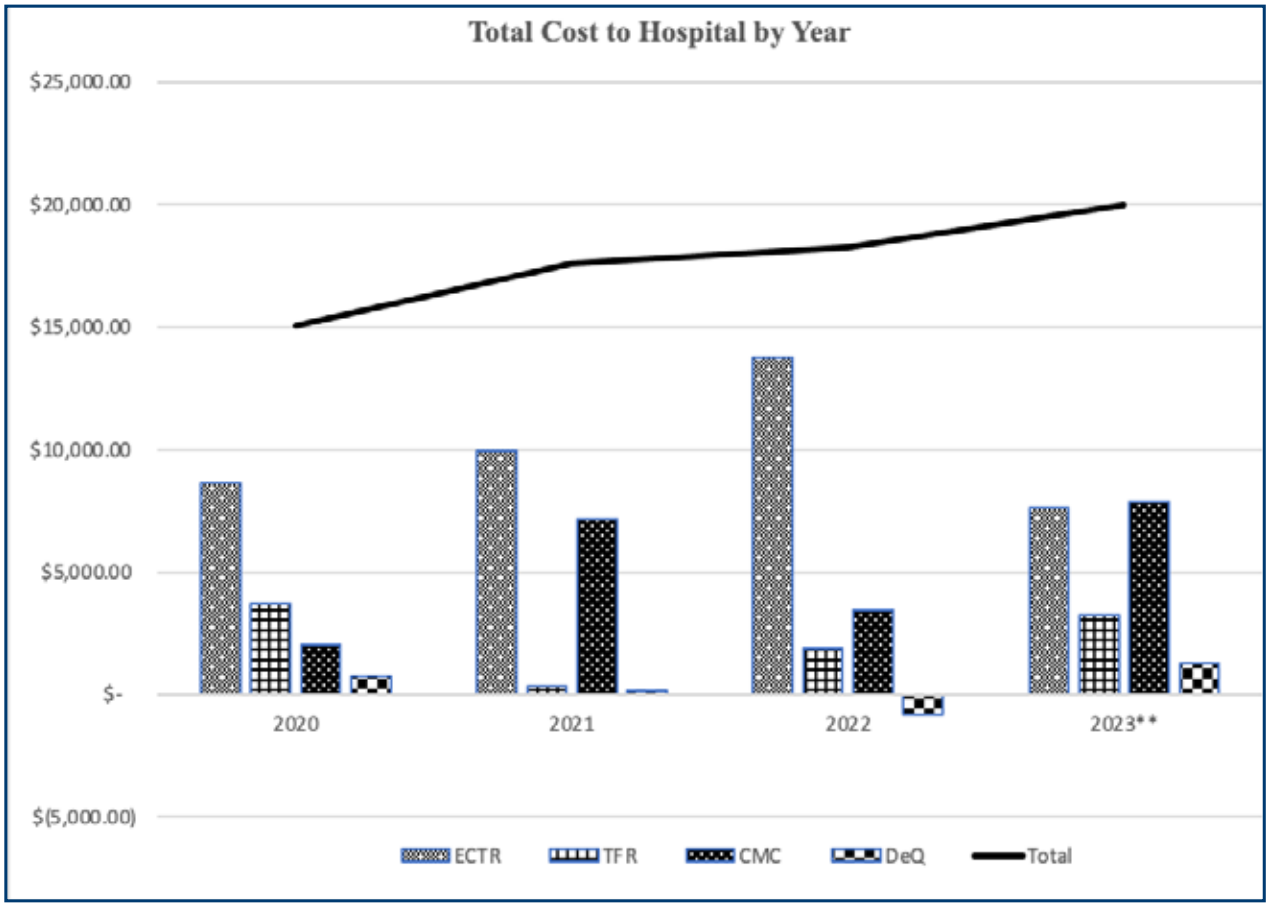
Conclusions: This study demonstrated that resident participation in a patient's surgical care leads to significant increases in operative and in-room times. These increased surgical times comes with significant financial costs for hospitals. Further research is needed to understand the effects of these potential and actualized costs, as well as to determine whether any disincentivization to resident participation exists.

Level of Evidence: Economic IV

Table 1. Mean operative and room times stratified by procedure type.

Endoscopic Carpal Tunnel Release	Resident Involvement	N (%)	Mean	Std. Deviation	Std. Error Mean	*P*	% Increase in Time
Operative Time (min)	Yes	154 (22.4)	0:16:49	0:03:58	0:00:19	< 0.001	24.3
	No	532 (77.6)	0:12:44	0:02:47	0:00:07		
Room Time (min)	Yes	154 (22.4)	0:34:44	0:06:59	0:00:33	< 0.001	13.1
	No	532 (77.6)	0:30:11	0:05:37	0:00:14		
Trigger Finger Release							
Operative Time (min)	Yes	55 (19.4)	0:11:43	0:03:37	0:00:29	0.004	13.1
	No	229 (80.6)	0:10:11	0:02:29	0:00:09		
Room Time (min)	Yes	55 (19.4)	0:29:13	0:10:25	0:01:24	0.046	10.0
	No	229 (80.6)	0:26:17	0:04:46	0:00:18		
Carpometacarpal Interpositional Arthroplasty							
Operative Time (min)	Yes	25 (53.2)	0:58:35	0:07:24	0:01:28	<0.001	24.5
	No	22 (46.8)	0:44:15	0:08:06	0:01:43		
Room Time (min)	Yes	25 (53.2)	1:24:21	0:10:05	0:02:01	<0.001	14.7
	No	22 (46.8)	1:11:59	0:08:54	0:01:53		
De Quervain Release							
Operative Time (min)	Yes	10 (25.0)	0:18:24	0:05:09	0:01:37	0.472	7.1
	No	30 (75.0)	0:17:06	0:03:35	0:00:39		
Room Time (min)	Yes	10 (25.0)	0:32:58	0:07:26	0:02:21	0.843	
	No	30 (75.0)	0:33:29	0:05:23	0:00:59		1.6

Figure 1. Total cost to hospital by year.



Resident Abstract

Evaluation of Non-Contact Low-Frequency Ultrasound versus Lalonde Protocol in the Treatment of Fingertip Amputations: Enhancing Healing for Patients

Robert W. Gomez, MD[1]; Abbigail Walsh, OTD[1]; Kristofer S. Matullo, MD[1]

[1]St. Luke's University Health Network, Bethlehem, PA

Abstract

Introduction: Acute traumatic fingertip amputations are a common and frequently treated injury within our health network. Both non-contact low-frequency ultrasound (NCLF-US) in combination with the Lalonde protocol and the Lalonde protocol alone are utilized as treatment for patients. This study aimed to assess whether NCLF-US is associated with expedited healing when compared to the Lalonde protocol alone in patients with an acute fingertip amputation.

Methods: A retrospective analysis was conducted on adult patients who had experienced an acute traumatic fingertip amputation without exposed bone. Outpatient care was administered by a single fellowship-trained orthopaedic hand surgeon and a single certified, licensed occupational therapist between February 2022 and April 2023. Exclusion criteria included patients with vascular disease or an active infection, those undergoing surgical intervention or primary closure, and those experiencing subsequent trauma following the initiation of treatment. Patients were prescribed either a novel NCLF-US therapy combined with the Lalonde protocol or the Lalonde protocol in isolation for amputation healing. Data collection included patient age, gender, diabetic status, and measurements of the initial fingertip amputation length and width to calculate surface area in millimeters. This data was used to assess cohort demographics and time to healing, defined as the time from initiation of therapy to full wound closure. Nominal and ratio variables were analyzed using Fisher's exact test and independent t-test, respectively. Statistical significance was determined with a significance level set at $p \leq 0.05$.

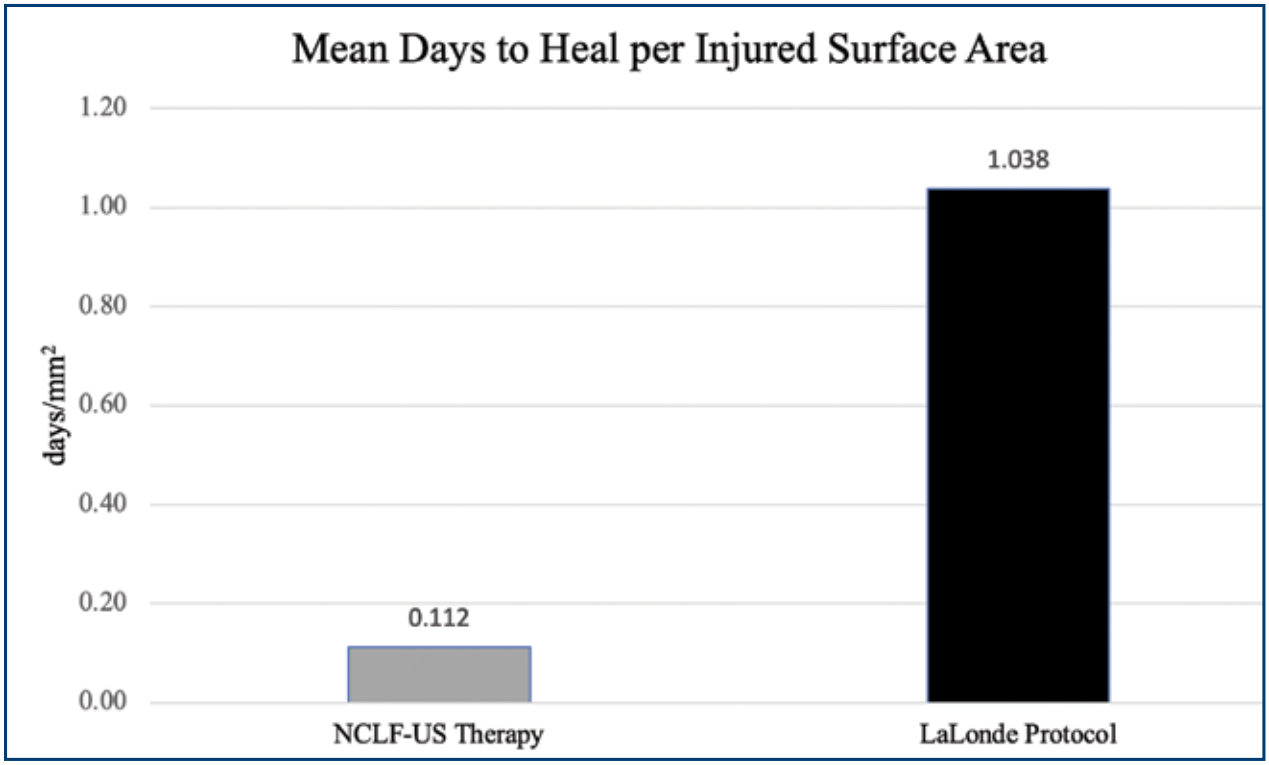
Results: Among 18 patients, there were 19 digits with an acute traumatic fingertip amputation. Nine digits were treated with NCLF-US in combination with the Lalonde protocol, and 10 digits received the Lalonde protocol alone. There was no significant difference between cohorts in terms of age (59.9±19.8 versus 44.2±13.7, p=0.067), gender (89% versus 70% male, p = 0.582) or diabetic status (11% versus 20% with a history of diabetes, p = 1.0). The NCLF-US cohort experienced significantly larger fingertip amputations (434.7±273.6 versus 123.0±150.3 mm2, p = 0.010), demonstrated a shorter time to healing (34.4±12.6 versus 49.2±17.6 days, p = 0.025), and exhibited a healing rate nine times faster than the Lalonde protocol alone (0.112±0.091 versus 1.038±0.812 days/mm2, p = 0.006).

Conclusions: In our study, the NCLF-US cohort had larger fingertip amputations, while demonstrating a time to healing nine times faster than those treated with the Lalonde protocol alone. These findings are encouraging and offer initial support for the integration of NCLF-US in the treatment of acute traumatic fingertip amputations without exposed bone.

Level of Evidence: Therapeutic IV

Figure 1. Initial and final image of patient who had undergone treatment with NCLF-US.

Figure 2. Comparison of the rate of healing per therapy.



Core Clinical Faculty Remarks

Attending Thank You's

Dr. Daniel Heckman

Thanks to all the residents for a great job this year. Congratulations Nate and JTP! You will represent St. Luke's well. All the best!

Dr. Dustin Greenhill

Thanks for staying sharp and working hard. To the graduates - good luck on the next part of your journey. To those still here - congrats on taking another step forward!

Dr. David Ramski

Congratulations to all the residents for their accomplishments and efforts in making Research Day and the journal a success! Best of luck to Juan Diego and Nathan as you graduate to the next step and represent St. Luke's in fellowship. You have made the program stronger and will make the faculty proud as you progress into your careers. We all look forward to the upcoming classes carrying forward the standard and striving toward excellence!

Dr. Nicholas Grimm

Congratulations to all of the residents on your hard work putting together this journal! Keep up the good work.

Dr. Douglas Lundy

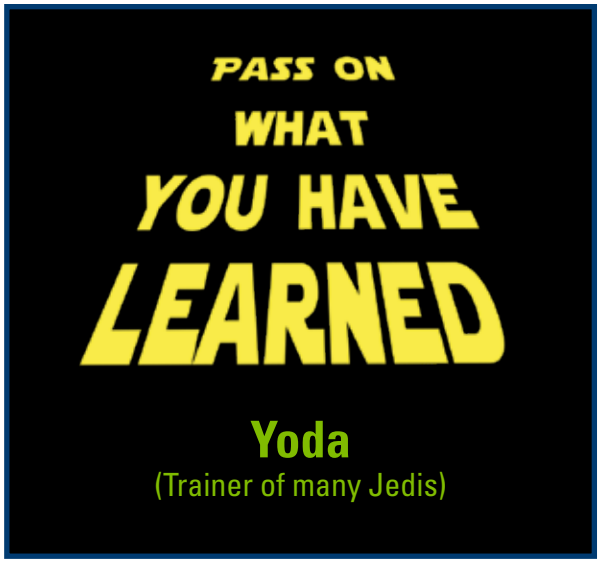
Doug and Peggy Lundy are delighted to congratulate the residents of the St. Luke's Orthopaedic Surgery Program on their significant academic achievements over the past year! We are also incredibly proud of our Chief Residents, Juan Diego Tio-Pagan, MD and Nathan W. White, MD on their successful completion of residency and the distinguished fellowships they will soon enter. We look forward to the future achievements of these two very fine orthopaedic surgeons!

Dr. Adam Sadler

To the Residents,
Thank you for all of your hard work and dedication this year. I greatly appreciate the detail oriented, empathetic, patient centered care you provide to our patients. I wish all of you nothing but success in your ongoing quest for academic and surgical excellence.

Dr. Kristofer Matullo

I would like to offer a sincere and heartfelt congratulations to our graduates, Dr. Juan Diego Tio Pagan and Dr. Nathan White! I have watched you both grow and develop over the last 5 years, changing from unsure interns to confident, knowledgeable and skillful Orthopaedic Surgeons. You have the skills and techniques that allow me to trust you to operate on my family. We are now Orthopaedic Colleagues and I wish you the best of luck in your fellowships and future careers. I know you will continue to make us proud!



St. Luke's Orthopaedic Alumni

CLASS OF 2023

Andrew Kantzos

Hometown: Phoenix, AZ
Undergraduate: Northwestern University
Med School: University of Arizona College of Medicine Phoenix
Fellowship: Orthopaedic Oncology at Memorial Sloan Kettering

Chad Anthony Amato

Hometown: St. Clair, MI
Undergraduate: Michigan State University
Med School: Wayne State University School of Medicine
Fellowship: Hand and Upper Extremity Surgery at Loma Linda University

CLASS OF 2022

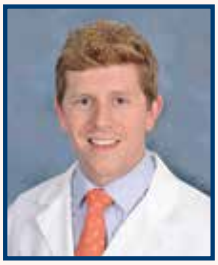
Ajith Malige, MD

Hometown: San Jose, CA
Undergraduate: University of California
Med School: Lewis Katz School of Medicine at Temple University
Fellowship: Orthopaedic Sports Medicine, Cedars Sinai-Kerlan Jobe Institute for Sports Medicine
Current Practice: Advanced Orthopaedics & Sports Medicine in San Francisco, CA

Andrew P. Konopitski, MD

Hometown: Asheville, NC
Undergraduate: Wake Forest University
Med School: Drexel University College of Medicine
Fellowship: Adult Reconstruction at UT Houston (McGovern)
Current Practice: St. Luke's University Health Network in Bethlehem, PA

CLASS OF 2021



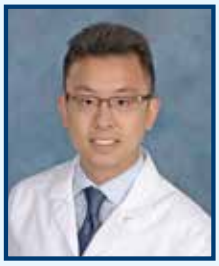
Jake T. Schroeder, MD

Hometown: York, PA
Undergraduate: Bucknell University
Med School: Sidney Kimmel Medical College at Thomas Jefferson University
Fellowship: Orthopaedic Sports Medicine at San Diego Arthroscopy and Sports Medicine
Current Practice: Rothman Orthopaedic Institute in Chalfont, PA

Anshul Agarwala, MD

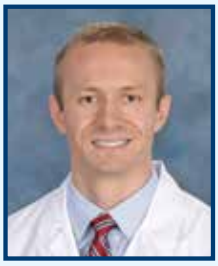
Hometown: Pittsburgh, PA
Undergraduate: Johns Hopkins University
Med School: Temple University School of Medicine
Fellowship: Orthopaedic Hand Surgery at Thomas Jefferson Hand to Shoulder Center
Current practice: Medical Associates at Dubuque, IA

CLASS OF 2020



Roger T. Yuh, MD

Hometown: Portland, OR
Undergraduate: Johns Hopkins University in Baltimore
Med School: Case Western Reserve University School of Medicine in Cleveland
Fellowship: Spine Fellowship at University of California Irvine
Current Practice: Sierra Pacific Orthopaedics in Fresno, CA



Shawn T. Yeazell, MD

Hometown: Nashville, TN
Undergraduate: University of North Carolina at Greensboro
Med School: University of North Carolina at Chapel Hill
Fellowship: Orthopaedic Sports Medicine and Shoulder Reconstruction at Steadman Hawkins Clinic of the Carolinas
Current Practice: Vidant Orthopaedics at Greenville, NC

CLASS OF 2019

David C. Roy, MD

Hometown: Grand Junction, CO
Undergraduate: Tufts University
Med School: University of Colorado, Denver
Fellowship: Hand Surgery Fellowship at the University of California San Francisco
Current Practice: Salinas Valley Memorial Healthcare System in Salinas, CA

David E. Ramski, MD

Hometown: Jacksonville, FL
Undergraduate: University of Florida, Gainesville
Med School: Georgetown University School of Medicine
Fellowship: Orthopaedic Trauma Fellowship at MetroHealth/ Case Western Reserve University
Current practice: St. Luke's University Health Network in Bethlehem, PA

CLASS OF 2018

Shane M. McGowan, MD

Hometown: Huntington, NY
Undergraduate: Quinnipiac University; Post University
Med School: The School of Medicine at Stony Brook University Medical Center
Fellowship: Spine Fellowship at University of Maryland Medical Center
Current practice: OrthoVirginia at Richmond, VA

Vince W. Lands, MD

Hometown: Baton Rouge, LA
Undergraduate: Southern University and A&M College
Med School: Meharry Medical College
Fellowship: Orthopaedic Trauma Fellowship at Cooper University Hospital
Current Practice: North Oaks Health System in Hammond, LA

St. Luke's Orthopaedic Alumni

CLASS OF 2017

Paul N. Morton, MD

Hometown: Kea 'au, HI
Undergraduate: Antioch College
Med School: University of Hawaii, John A. Burns School of Medicine
Fellowship: Joint Reconstruction at University of Chicago Bone and Joint Replacement Center
Current Practice: The Queen's Medical Center in Honolulu, Hawaii

Anup K. Gangavalli, MD

Hometown: Oneonta, NY
Undergraduate: Stony Brook University
Med School: The School of Medicine at Stony Brook University Medical Center
Fellowship: Spine Surgery at Cleveland Clinic Center for Spine Health
Current Practice: Ortho Virginia at Richmond, VA

CLASS OF 2016

Vamsi K. Kancherla, MD

Hometown: Chicago, IL
Undergraduate: Lehigh University
Med School: University of Pennsylvania School of Medicine
Fellowship: Spine Surgery at Cleveland Clinic Center for Spine Health
Current practice: Northeast Georgia Medical Center at Gainesville, GA

Nicholas M. Caggiano, MD

Hometown: West Chester, PA
Undergraduate: University of California, San Diego
Med School: Emory University
BIDMC Harvard Orthopaedic Hand Fellowship
Current Practice: Central Coast Orthopaedic Medical Group in San Luis Obispo, CA

CLASS OF 2015

Daniel M. Avery, III, MD

Hometown: Birmingham, AL
Undergraduate: Auburn University
Med School: University of Alabama at Birmingham
Fellowship: Orthopaedic Sports Medicine, UCONN Health and Hand and Upper Extremity Fellowship at the Hospital for Special Surgery
Current Practice: OrthoSports Associates in Birmingham, AL

Crystal M. Dickson, MPH, MD

Hometown: Washington, DC
Undergraduate: Cornell University
Graduate: Columbia University Mailman School of Public Health
Med School: University of Colorado, Denver
Fellowship: Medical College of Virginia, Virginia Commonwealth University Fellowship: Foot & Ankle at University of Pennsylvania
Current Practice: Orthopaedics East and Sports Medicine Center in Greenville, NC

CLASS OF 2014

John-David Black, MD

Hometown: Hillsboro, TX
Undergraduate: University of Utah
Med School: Ohio State University College of Medicine
Fellowship: Orthopaedic Trauma at Wellspan York Hospital
Current practice: Kadlec Clinic Northwest Orthopaedic & Sports Medicine in Richland, WA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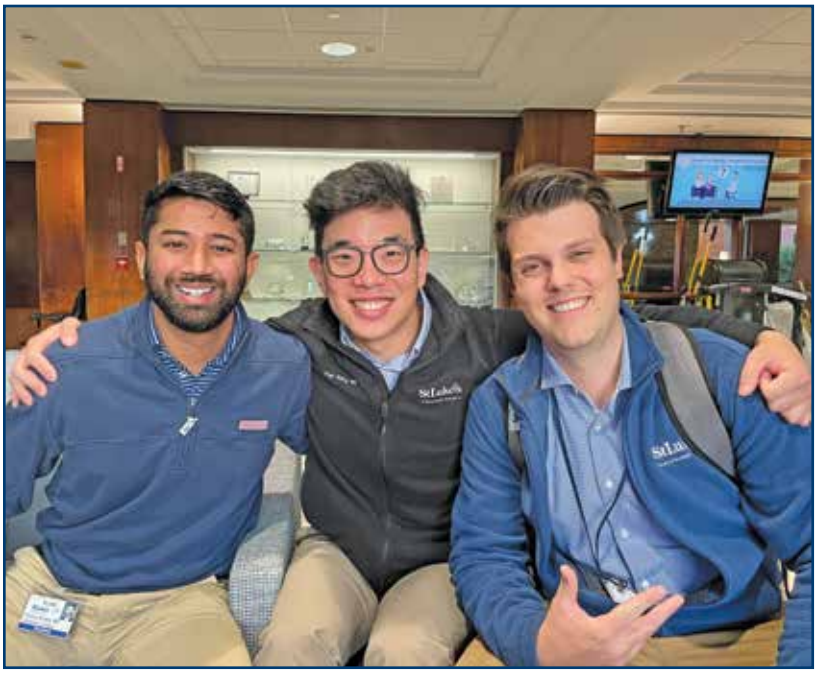
St. Luke's Resident Collage



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