FIFTH ANNUAL

OREF VIRTUAL NATIONAL

RESIDENT RESEARCH SYMPOSIUM

Wednesday, November 12, 2025

5:30 p.m. CST

OREF National Resident Symposium Grand Champions

The winner of this evening's symposium will be named the 2025 OREF National Resident Research Symposium Champion. The winner will attend the 2026 AAOS Annual Meeting in New Orleans as OREF's guest where they will be presented with their award.

Past National Symposium winners appreciated the opportunity that attending the Annual Meeting gave them to meet OREF grant recipient alumni who offered insights into their research careers.

2021 Champion
Katherine Gerull, MD
Washington University in St. Louis
Attrition Among Residents Entering U.S. Orthopedic Surgery Residency Programs: Analysis of National GME Census Data

2022 Champion
Kyle W. Morse, MD
The Hospital for Special Surgery
A Vertebral Stem Cell Mediating Spine Fusion

2023 Champion
Brendan Shi, MD
University of California, Los Angeles
Bisphosphonate Chaperones Effectively Target the Enthesis Without Impairing Soft Tissue-to Bone Repair Integrity

2024 Champion
Zaamin Hussain, MD
Emory University
Incision or Excision? What to do with the A1 Pulley for Trigger Finger: Results of a Multi-Surgeon Randomized Controlled Trial

Table of Contents

About OREF:
The Orthopaedic Research and Education Foundation (OREF) is a charitable 501(c)(3) organization committed to improving lives by supporting excellence in orthopaedic research through its grant funding and research education programs. As an independent nonprofit, OREF strives to improve clinical care and patient outcomes by advancing innovative research, developing new investigators, and uniting the orthopaedic community in promoting musculoskeletal health. Visit oref.org or follow OREF on LinkedIn (Orthopaedic Research and Education Foundation) Facebook (OREFtoday) and X (@OREFtoday).

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OREF NATIONAL
RESIDENT RESEARCH SYMPOSIUM
SUMMARY AGENDA
Wednesday, November 12, 2025

5:30 p.m. – 5:40 p.m.	**Welcome and Introductions** Joshua J. Jacobs, MD President Orthopaedic Research and Education Foundation Lee Grossman, MBA, ML Chief Executive Officer Orthopaedic Research and Education Foundation
5:40 p.m. – 6:10 p.m.	**Session I – Resident Research Presentations and Discussion** **Moderator: Joshua J. Jacobs, MD**
	Break - ***Judges and Presenters – At this time, please finalize your scores for Session I***
6:15 p.m. – 6:50 p.m.	**Session II – Resident Research Presentations and Discussion** **Moderator: Joshua J. Jacobs, MD**
	Break – ***Judges and Presenters – At this time, please finalize your scores for Session II***
6:55 p.m. – 7:30 p.m.	**Session III – Resident Research Presentations and Discussion** **Moderator: Joshua J. Jacobs, MD**
	Break – ***Judges and Presenters – At this time, please finalize and submit your scores for all Sessions***
7:35 p.m. – 7:40 p.m.	**Introduction of Keynote Speaker** Joshua J. Jacobs, MD
7:40 p.m. – 8:00 p.m.	**Keynote Speaker** Brian Feeley, MD **How Not To Hate Your Job** Chief, Sports Medicine and Shoulder Surgery Department of Orthopedic Surgery, UCSF Ron Conway Family Professor of Sports Medicine Research Team Physician, SF Giants
8:00 p.m. – 8:10 p.m.	**Awards Presentation**
8:10 p.m. – 8:15 p.m.	**Closing Remarks**

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KEYNOTE SPEAKER

Brian Feeley, MD

Chief, Sports Medicine and Shoulder Surgery
Department of Orthopedic Surgery, UCSF
Ron Conway Family Professor of Sports Medicine Research
Team Physician, SF Giants
University of California, San Francisco

Dr. Brian Feeley is an orthopedic surgeon who specializes in using arthroscopic (minimally invasive) procedures to address shoulder and knee injuries in athletes as well as non-athletes. In the shoulder, he treats rotator cuff tears, impingement, labral tears and other causes of instability, clavicle fractures and shoulder arthritis. He also performs shoulder replacement surgery, specializing in reverse shoulder replacements. In the knee, he treats ligament injuries (such as ACL tears), meniscus tears, cartilage injuries and early arthritis. He is chief of UCSF's sports medicine and shoulder surgery division and director of the MITO (Muscle Injury and Translational Orthopedic) Laboratory.

Dr. Feeley has been the Ron Conway Family Endowed Professor in Sports Medicine Research since 2022. His studies focus on how muscle injury and recovery affect orthopedic outcomes. His research team evaluates muscle progenitor cells, looking at how they respond to different types of injury and degeneration, especially rotator cuff tears. The team evaluates and designs physical and pharmacological strategies to promote muscle regeneration. This research has received funding from the National Institutes of Health, Department of Veterans Affairs, California Institute for Regenerative Medicine and philanthropic organizations.

After earning a bachelor's degree in biology and his medical degree at Stanford University, Dr. Feeley completed a residency in orthopedic surgery at the Ronald Reagan UCLA Medical Center. He then completed a fellowship in sports medicine and shoulder surgery at The Hospital for Special Surgery, where he served as an assistant team physician to the New York Giants football team. Since joining UCSF in 2008, he has served UCSF's orthopedic surgery residency and sports medicine fellowship programs in a variety of leadership roles.

Dr. Feeley has published more than 300 peer-reviewed articles, review studies and book chapters, as well as a textbook on rotator cuff injuries. He serves on the National Football League's musculoskeletal committee and on several national orthopedic research and leadership committees, including in an editorial capacity. In his early career, he received young investigator awards from the American Orthopaedic Society for Sports Medicine (AOSSM), Orthopaedic Research and Education Foundation, and Western Orthopaedic Association. He has received a teaching award from the UCSF School of Medicine as well as research awards from the AOSSM and American Shoulder and Elbow Surgeons. In 2025, he won the prestigious Kappa Delta Award from the American Academy of Orthopaedic Surgeons, an honor that recognizes researchers who have achieved "a large body of cohesive scientific work generally reflecting years of investigation."

Dr. Feeley serves as a team physician for the San Francisco Giants as part of UCSF Health and the team's partnership, which includes providing top-tier medical care to players, staff and visitors at Oracle Park as well as offering wellness programs to the community. He is also team physician for St. Ignatius College Preparatory. An avid surfer, he especially enjoys the waves at San Francisco's Ocean Beach, in San Diego and on Kauai. In his spare time, he runs with his wife, Gail Cornwall-Feeley, reads alongside his five children, and co-hosts the podcast "Six to Eight Weeks: Perspectives on Sports Medicine."

Judges

OREF Research Grants Committee Members

Judges

Andrew Pollak, MD
University of Maryland

Matthew J. Silva, PhD
Washington University in St. Louis

Brian Snyder, MD, PhD
Boston Children’s Hospital

Moderator

Joshua J. Jacobs, MD
Rush University Medical Center

OREF National Resident Research Symposium
DETAILED AGENDA
Wednesday, November 12, 2025
Program commencing at 5:30 p.m. CST

5:30 p.m. – 5:40 p.m.	**Welcome and Introductions** Joshua J. Jacobs, MD President Orthopaedic Research and Education Foundation Lee Grossman, MBA, ML Chief Executive Officer Orthopaedic Research and Education Foundation
	Session I – Resident Research Presentations & Discussion **Moderator: Joshua J. Jacobs, MD**
5:40 p.m. – 5:45 p.m.	*Tracking Wearable Device Compliance in Total Knee Arthroplasty Recovery* Joseph Geller, MD, Jackson Memorial Hospital/University of Miami
5:45 p.m. – 5:50 p.m.	*Early Anterior Cruciate Reconstruction Mitigates the Development of Post-Traumatic Osteoarthritis in a Murine Anterior Cruciate Ligament Rupture Model* Julia Retzky, MD, The Hospital for Special Surgery
5:50 p.m. – 5:55 p.m.	*Ten Years of a Novel Telemedicine System for Management of Statewide Hand Trauma in Arkansas–A Decade in Review* Katherine J. Montoya, MD, University of Arkansas for Medical Sciences
5:55 p.m. – 6:00 p.m.	*Comparison of Retear Rates and All-Cause Reoperation Rates in Pediatric and Adolescent ACL Reconstructions Using Bone Patellar Tendon and Quadriceps Tendon Grafts* Kyla Petrie, MD, University of California, San Francisco
6:00 p.m. – 6:10 p.m.	Question and Answers
6:10 p.m. – 6:15 p.m.	Break – ***Judges and Presenters – At this time, please finalize your scores for Session I***
	Session II – Resident Research Presentations & Discussion **Moderator: Joshua J. Jacobs, MD**
6:15 p.m. – 6:20 p.m.	*Consideration of Updated Breast Cancer Screening in Female Orthopaedic Surgeons: A Comprehensive Review* Olivia de Araujo, MD, Jackson Memorial Hospital/University of Miami
6:20 p.m. – 6:25 p.m.	*Overhead Athletes Have Comparable Intraoperative Injury Patterns and Clinical Outcomes to Non-Overhead Athletes Following Surgical Stabilization for First Time Anterior Shoulder Instability at Average 6-year Follow-up* Zachary J. Herman, MD, University of Pittsburgh Medical Center
6:25 p.m. – 6:30 p.m.	*Predictors of Anterior Cruciate Ligament Re-injury and Return to Sports in Adolescent Athletes: Increased Risk in Younger Age and Earlier Time to Return to Sport* Bhargavi Maheshwer, MD, University Hospitals Cleveland Medical Center

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OREF National Resident Research Symposium
DETAILED AGENDA
Wednesday, November 12, 2025

6:30 p.m. – 6:35 p.m.	*Shorter Relative Patellar Defect Length after Bone Patellar Tendon Bone Anterior Cruciate Ligament Reconstruction is Associated with Better Postoperative Patient-Reported Outcomes at 1-year Follow-up* Grant Schroeder, MD, Stanford University
6:35 p.m. – 6:40 p.m.	*Reverse Anatomical Front and Back Reconstruction for Volar Intercalated Segment Instability Non-Dissociative: A Biomechanical Study* Sreetha Sidharthan, MD, The Hospital for Special Surgery
6:40 p.m. – 6:50 p.m.	Question and Answer
6:50 p.m. – 6:55 p.m.	Break – ***Judges and Presenters – At this time, please finalize your scores for Session II***
	Session III – Resident Research Presentations & Discussion **Moderator: Joshua J. Jacobs, MD**
6:55 p.m. – 7:00 p.m.	*The Effect of Posterior Tibial Slope on Tibiofemoral Joint Biomechanics: An In-Vitro Analysis* Alexander E. White, MD, The Hospital for Special Surgery
7:00 p.m. – 7:05 p.m.	*Optimizing Contact Pressures of the Posterior Heel During Lower Extremity Immobilization: A Biomechanical Study* Erik Nakken, MD, University of Michigan
7:05 p.m. – 7:10 p.m.	*Predictive Factors of Having a Second UBC-Related Pathologic Fracture* Mathangi Sridharan, MD, University of California, Los Angeles
7:10 p.m. – 7:15 p.m.	*Low Complication Rate Following Contemporary Pure Anteriorization Tibial Tubercle Osteotomy for Patellofemoral Overload* Nathan Varady, MD, The Hospital for Special Surgery
7:15 p.m. – 7:20 p.m.	Skeletal Age Assessment from Knee Radiographs Using Deep Learning Joshua T. Bram, MD, The Hospital for Special Surgery
7:20 p.m. – 7:30 p.m.	Question and Answer
7:30 p.m. – 7:35 p.m.	Break - ***Judges and Presenters – At this time, please finalize and submit your scores for all Sessions***
7:35p.m. – 7:40 p.m.	Introduction of Keynote Speaker Joshua J. Jacobs, MD
7:40 pm – 8:00 p.m.	**Keynote Speaker** Brian Feeley, MD **How Not To Hate Your Job** Chief, Sports Medicine and Shoulder Surgery Department of Orthopedic Surgery, UCSF Ron Conway Family Professor of Sports Medicine Research Team Physician, SF Giants University of California, San Francisco
8:00 p.m. – 8:10 p.m.	Awards Presentation
8:10 p.m. – 8:15 p.m.	Closing Remarks

Tracking Wearable Device Compliance in Total Knee Arthroplasty Recovery

Joseph Geller, MD
Jackson Memorial Hospital/University of Miami

Purpose: Social determinants of health (SDOH) do not predict compliance with wearable technology following total knee arthroplasty (TKA).

Significance: Patient recovery following TKA requires consistent rehabilitation, restoring strength, range of motion, and functionality. Wearable devices provide continuous tracking of recovery metrics, improving recovery insights. This study evaluates sociodemographic factors influencing patients to actively or passively interact with wearable devices. Identifying factors associated with active compliance is essential for optimizing the effectiveness of wearable technology in post-surgical rehabilitation.

Methodology: The TracPatch System includes two wearable devices tracking a patient's recovery following TKA. Data from 182 patients at a single academic center were analyzed retrospectively. Passive compliance was measured by the number of days the device recorded steps, while active compliance was measured by the number of days the patient used the system's exercises.

Results: Sociodemographic factors do not significantly affect passive or active compliance. Tukey's HSD pairwise group comparisons assessed the relationships between demographic variables and compliance.

Conclusion: SDOH does not predict wearable technology utilization, suggesting that this technology may be readily applied to wide range of populations. Additionally, these findings suggest that factors beyond demographics, such as patient education, device usability, and motivation, are more impactful determinants of compliance.

Early Anterior Cruciate Ligament Reconstruction Mitigates the Development of Post-Traumatic Osteoarthritis in a Murine Anterior Cruciate Ligament Rupture Model

Julia Retzky, MD
The Hospital for Special Surgery

Purpose*:* Primary aim: To evaluate the impact of timing of anterior cruciate ligament reconstruction (ACLR) on the development of PTOA using a murine non-invasive ACL rupture model. Secondary aim: To evaluate the impact of ACLR timing on pain-related gait behaviors, peripheral/central immune response, knee range of motion (ROM), and tendon graft-bone tunnel healing.

Significance: The impact of ACLR timing on development of PTOA remains subject to debate.

Methods: Fifty-five 11-12-week-old male B6 mice were randomized to one of three conditions: ACL rupture only, ACL rupture followed by immediate ACLR, or ACL rupture followed by delayed ACLR (7 days post-injury). Uninjured animals were controls. Sacrifice was at 28 days (postoperatively/post-injury). Primary outcome measure: histologic evaluation using Osteoarthritis Research Society International (OARSI) score. Secondary outcomes: ROM, flow cytometry (ipsilateral iliac lymph node/spleen), gait analysis, and micro-computed tomography (μCT) analysis.

Results: The ACL rupture and delayed ACLR groups had higher femoral and tibial OARSI scores, consistent with a greater degree of osteoarthritic changes, compared to the control and immediate ACLR groups ($p<0.001$ for all). There were no differences between groups with respect to ROM, tendon graft-to-bone healing (μCT), or pain-related gait behaviors. There was an increase in total ipsilateral iliac lymph node cellularity in the surgical cohorts compared to the ACL rupture and control cohorts.

Conclusion: Immediate ACLR mitigates the development of PTOA in a murine ACL rupture model.

Ten Years of a Novel Telemedicine System for Management of Statewide Hand Trauma in Arkansas - A Decade in Review

Katherine J. Montoya, MD
University of Arkansas for Medical Sciences

Purpose: We hypothesize that the rate of EMS transfer for hand trauma in Arkansas has significantly decreased since the establishment of the Arkansas Hand Trauma Telemedicine Program (AHTTP) in 2014.

Significance: Hand trauma is a challenge to triage and manage, especially in rural states, due to the relative paucity of fellowship-trained hand surgeons and of equipped treatment centers. Preliminary data have suggested early success of the AHTTP, but no long-term data have been analyzed.

Methods: Data from all AHTTP encounters were used to compare trends in program utilization and interfacility transfers from 2013-2023. Trend analyses were conducted on percentage of overall and EMS-based interfacility transfers during the study period (2013-2023).

Results: The AHTTP has facilitated 7,260 remote hand trauma consults since 2014. The overall rate and EMS rate of transfer have significantly decreased from 73.1% to 55.2% ($p < .0001$), and 44.9% to 33.2% ($p < .0001$) respectively. An estimated 2,519 EMS ground and 156 air transfers have been saved (estimated cost savings of $9,515,000).

Conclusion: The AHTTP has significantly decreased the rate of EMS ground and air interfacility transfer for hand trauma in Arkansas, correlating to an estimated cost savings of $9.5M and increased availability of EMS resources.

Comparison of Retear Rates and All-Cause Reoperation Rates in Pediatric and Adolescent ACL Reconstructions Using Bone Patellar Tendon and Quadriceps Tendon Grafts

Kyla Petrie, MD
University of California, San Francisco

Introduction: The rate of pediatric and adolescent ACL tears continues to rise as young athletes continue to engage in competitive, year-round sporting activity. Unlike the adult population, young patients undergoing reconstruction are faced with a higher risk of re-tear as well as balancing potential growth disturbances. Although the bone patellar tendon bone (BTB) grafts have historically been the graft of choice for athletes, quadriceps tendon grafts have gained increasing popularity. Yet, there is limited comparative data between these grafts in the pediatric and adolescent population.

Methods: We retrospectively reviewed the charts of patients who underwent ACL reconstruction with BTB autograft or quad tendon autograft between 2013 and 2023. We gathered data on age, gender, graft type, high-risk sporting participation, post-operative compliance, associated injuries, length of follow-up, incidence of repeat surgery on the ipsilateral knee, graft re-tear and patient reported outcomes. We then attempted to call all patients to gather more long-term follow-up data as well as data on return to sport rates.

Results: We identified 158 patients. The cohort of patients was 38.1% female with a mean age of 16.47 years (SD 1.50 years, range from 13 - 22). There was a significant difference in all cause reoperation rates (5.6% BTB vs 1.3% quad, p = <0.001) with the BTB graft having a higher reoperation rate than quad tendon graft. There was no significant difference in graft retear rate (3.2% BTB vs 0.6% quad; p = 0.494) based on graft type used. Gender (100% who retore were male, p = .048) and compliance with the post-operative protocol were both significantly associated with graft retear (83% who retore were not compliant, p < 0.001). Patients who returned to sport had significantly higher IKDC scores compared to those who did not (94.14 vs 72.24; $t(39) = 15.438$, $p < 0.001$). Gender and return to sport approached significance, with 70% of the males returning to sport at the same level compared with only 45% of the females (p = .079). Finally, no variables were significant predictors of the post-operative IKDC in our regression analysis, nor were there any significant differences in post-operative IKDC scores based on graft type.

Conclusion: There was a significant difference in all-cause reoperation rates, but no significant difference in graft retear rates, between BTB and quadricep tendon autograft. However, there appeared to be a trend toward lower graft retear rates with quad tendon autograft. Gender and compliance with post-operative restrictions were both associated with higher retear rates. Patients with higher post-operative IKDC scores were significantly more likely to return to sport at the same level. There was a trend toward male patients returning to sport compared to female patients.

Consideration of Updated Breast Cancer Screening in Female Orthopaedic Surgeons: A Comprehensive Review

Olivia de Araujo, MD
Jackson Memorial Hospital/University of Miami

Purpose: Use of fluoroscopy is a fundamental part of orthopaedic surgical procedures however, increased radiation exposure for female surgeons is not without risk.

Significance: This comprehensive review investigated modifying breast cancer screening in female orthopaedic surgeons from mammography (mean lifetime glandular dose of 0.3 rem) to ultrasound or MRI due to their occupational radiation exposure.

Methods: A comprehensive review was performed using PubMed, Scopus, CINAHL, Embase, and MEDLINE from inception to January 6, 2025, by querying "(orthopaedic) AND ((breast cancer screening) OR (radiation exposure))". Articles were included if available in English and reported on radiation exposure and breast cancer in orthopaedics.

Results: Altogether 7933 studies were screened with 165 meeting selection criteria. Compared to U.S. females, there was a 3.97-fold higher prevalence of breast cancer among female orthopaedic surgeons. The mean radiation dose per orthopaedic procedure was 0.002 rem with femoral and pelvic fixation having doses up to 0.031 rem.

Conclusion: As some studies found up to 100 rem exposure over a 30-year career and a retrospective annual limit of 10 rems/year is recommended, at 10 years surgeons may be reaching their lifetime limit. The significantly increased prevalence of breast cancer in female orthopaedic surgeons warrants further consideration.

Overhead Athletes Have Comparable Intraoperative Injury Patterns and Clinical Outcomes to Non-Overhead Athletes Following Surgical Stabilization for First Time Anterior Shoulder Instability at Average 6-year Follow-Up

Zachary J. Herman, MD
University of Pittsburgh Medical Center

Purpose: Little is known regarding the differences in clinical outcomes after operative management of overhead vs. non-overhead athletes with first-time anterior shoulder instability.

Significance: Elucidating a difference in outcomes of these populations may drive treatment strategies.

Methods: Patients with first-time anterior shoulder instability were included. Exclusion criteria included multiple dislocations and multidirectional shoulder instability. Baseline demographic characteristics, imaging data, examination findings, and intraoperative findings were retrospectively collected. Patient-reported outcomes including ASES score, WOSI score, Brophy score, and SSV in addition to return-to-work and -sport, recurrent dislocation, and revision rates were prospectively collected.

Results: 256 patients met inclusion criteria; 178 (70%) were non-overhead athletes. There was no significant difference in demographics, concomitant shoulder pathology, or preoperative range of motion or strength between cohorts. A greater proportion of overhead athletes presented with instability events not requiring manual reduction (subluxations). With average follow- up of 6.7 years, no significant differences were found between groups with respect to recurrent postoperative instability event rates, revision rates, ASES score, WOSI score, Brophy score, SSV, or rates of return to work or sport.

Conclusion: The findings of this study suggest that overhead athletes can be considered in the same treatment pathway for first-time dislocation as non-overhead athletes.

Predictors of Anterior Cruciate Ligament Re-Injury and Return to Sport in Adolescent Athletes: Increased Risk in Younger Age and Earlier Time to Return to Sport

Bhargavi Maheshwer, MD
University Hospitals Cleveland Medical Center

Purpose: Characterize recent epidemiologic trends of anterior cruciate ligament (ACL) injuries and graft failure rates in high school adolescents and determine variables associated with sustaining secondary ACL injury.

Significance: Delayed return to sport may be protective in this high-risk population.

Methods: A retrospective review was performed for all minors age 13-17 who underwent primary ACL reconstruction between 2015 to 2020. Odds ratios were calculated for baseline patient characteristics and association with risk of recurrent tear. Multivariate regression analyses identified relationships between recurrent tear and specific categorical variables.

Results: Four-hundred-thirty-one patients were included. Recurrent primary graft failure was in 9.0% of patients, and 11.1% sustained a contralateral ACL tear. With respect to combined secondary ACL injuries, as age at primary ACLR increased by 1 year, the rate of secondary ACL injury decreases by 27%. For every subsequent 1-month delay in return to sport, the risk of secondary ACL injury decreased by 13%.

Conclusion: Younger age and earlier time to return to sport following ACL injury are independent risk factors associated with sustaining both primary ACL recurrent tear and contralateral ACL injury in the adolescent patient population. Counseling of adolescent athletes should include allowing adequate healing and time to return to sport.

Shorter Relative Patellar Defect Length after Bone Patellar Tendon Bone Anterior Cruciate Ligament Reconstruction is Associated with Better Postoperative Patient-Reported Outcomes at 1-Year Follow-up

Grant Schroeder, MD
Stanford University

Purpose: This study evaluates bone patellar tendon bone (BTB) autograft anterior cruciate ligament reconstruction (ACLR) patella defect dimensions over time and associates these with patient reported outcomes (PROs).

Significance: BTB autograft ACLR has the drawback of higher rates of anterior knee pain compared to other autograft options, however the impact of patellar defect size is unknown.

Methods: Knee MRI, absolute and relative defect/patella dimensions, and Knee injury and Osteoarthritis Outcome Scores (KOOS) were obtained 6 weeks and 1 year postoperatively in 23 patients (15 males) mean age 25.5 ± 5.2 years, who underwent BTB ACLR.

Results: A shorter relative defect length at 6 weeks post-surgery was associated with better KOOS scores at 1 year postoperatively in KOOS subscales of Pain ($p = 0.046$), Activities of Daily Living ($p = 0.011$), Function in Sports and Recreation ($p = 0.001$), and knee related Quality of Life ($p = 0.023$). Of the participants with a relative defect length < 0.5 relative to the pole-to-pole patella length, 8/8 (100%) achieved Patient Acceptable Symptom State thresholds for both Pain and Sports/Rec.

Conclusion: Shorter relative patellar defect length after BTB ACLR is associated with better PROs at 1 year and should be a consideration during graft harvest.

Reverse-Anatomical Front and Back Reconstruction for Volar Intercalated Segment Instability Non-Dissociative: A Biomechanical Study

Sreetha Sidharthan, MD
The Hospital for Special Surgery

Purpose: We hypothesize that a reverse anatomical front and back (RANAFAB) technique will restore normal wrist kinematics by reducing lunate flexion, capitate translation, and midcarpal shift in a cadaveric model of volar intercalated segment instability non-dissociative (CIND-VISI).

Significance: While limited midcarpal or four-corner fusions are used to treat CIND-VISI, they often sacrifice motion. There is a need for motion-preserving surgical solutions that restore stability.

Methods: Seven cadaveric wrists underwent sectioning of critical volar and dorsal midcarpal ligaments to simulate CIND-VISI. A synthetic tape was weaved through the carpus to reconstruct the affected ligaments (RANAFAB). Testing was performed on a custom jig that applied a 40N palmar-directed force to the capitate during video-fluoroscopy. Specimens were tested intact, post-ligament sectioning, and post-reconstruction. Radiolunate angle (RLA), capitate displacement, and midcarpal shift were analyzed at each state.

Results: In all seven specimens, ligament sectioning produced a positive midcarpal shift test and reconstruction with the RANAFAB technique eliminated wrist clunking ($p<0.001$). RANAFAB reduced mean RLA by 33.8° ($p=0.007$) and decreased capitate displacement by 7.8 mm ($p=0.004$) compared to the CIND-VISI state.

Conclusion: RANAFAB restored normal wrist kinematics and eliminated instability in a cadaveric model of CIND-VISI and may offer a motion-preserving surgical alternative for younger patients seeking to avoid arthrodesis.

The Effect of Posterior Tibial Slope on Tibiofemoral Joint Biomechanics: An In-Vitro Analysis

Alexander E. White, MD
The Hospital for Special Surgery

Purpose: The purpose of this study was to quantify the effects of posterior tibial slope (PTS) on tibiofemoral contact mechanics in cadaveric knees through axial loading with knee flexion. We hypothesized that decreased PTS will translate the tibial weight center of contact (WCoC) anteriorly and there will be no change in peak contact pressures between high and low PTS.

Significance: Very few studies investigate the joint-level contact mechanics following anterior closing wedge osteotomy being performed for recurrent ACL failure.

Methods: Anterior tibial osteotomies were performed on 5 cadaveric knees mounted to a robotic test system. Knee test conditions included: (1) intact, (2) increased PTS, and (3) decreased PTS, which were tested at 0°, 15°, 30°, and 45° flexion. WCoC and peak contact stress were recorded.

Results: In the lateral compartment, increased PTS shifted the WCoC posteriorly 2.1mm and increased PTS shifted the WCoC anteriorly 5.2mm. No significant directional changes occurred in the medial compartment, and there were no significant changes in peak contact stresses after either osteotomy at low flexion angles.

Conclusion: Decreased PTS translates the tibial WCoC anteriorly, while increased PTS shifts the WCoC posteriorly in the lateral compartment without significantly affecting peak tibiofemoral contact stresses.

Optimizing Contact Pressures of the Posterior Heel During Lower Extremity Immobilization: A Biomechanical Study

Erik Nakken, MD
University of Michigan

Purpose: This study hypothesizes that heel floating positioning and increased padding reduce posterior heel contact pressures in short leg splints (SLS) and controlled ankle motion (CAM) boots.

Significance: SLS and CAM boots are essential in orthopaedic care but carry the risk of posterior heel pressure injuries. There is limited biomechanical data to guide optimization of contact pressure in these devices.

Methods: Twenty legs from ten volunteers were analyzed. In a SLS, heel contact pressures were measured with varying padding thicknesses (0–10 layers), heel positions (resting versus floating), and brands. In a CAM boot, heel resting versus floating was tested. Pressures were compared to a 32mmHg threshold representing dermal arteriolar capillary collapse.

Results: In a SLS, mean heel resting pressures remained above 32mmHg, regardless of padding thickness or brand. Floating the heel with 8-10 layers of padding reduced pressures below 32mmHg. In a CAM boot, only 55% of legs with the heel floating achieved similar reductions. Improperly bunched/folded padding behind the heel in a SLS increased pressure three-fold.

Conclusion: Floating the heel significantly reduces pressure in both SLS and CAM boots. This highlights the importance of education on proper heel positioning and SLS design to optimize heel contact pressures.

Predictive Factors of Having a Second UBC Related Pathologic Fracture

Mathangi Sridharan, MD
University of California, Los Angeles

Purpose: This study examines factors predictive of a second pathologic fracture related to unicameral bone cysts (UBC).

Significance: This can further inform timing of surgical fixation of UBC.

Methods: All patients presenting with UBC at a single institution between 1/1/2012 and 1/1/2025 were retrospectively reviewed. Variables collected were age, gender, insurance status, pain level, anatomic site, pathologic fracture at presentation, location in bone (epiphysis, diaphysis, metaphysis), cyst size (<1/3, 1/3-2/3, >2/3 bone width), cortical involvement, and active status (<10mm from physis). Primary outcome was second pathologic fracture. Descriptive statistics and logistic regression analysis were performed (Stata). Significance was set at $P<0.05$.

Results:179 patients were included. Average age was 16.3+/-15.9. 30 patients (16.7%) had minimal pain, 56 (31.3%) moderate, and 14 (7.8%) severe at presentation. 140 (78.2%) cysts had cortical involvement. Most cysts were >2/3 bone width, 146 (83.9%). 125 (69.8%) patients presented with a pathologic fracture. 27 (15.1%) patients had a second pathologic fracture; predictive factors were skeletal immaturity (OR 10.6, P=0.007), active cysts (OR 2.4, P=0.06), and public insurance status (OR 3.2, P=0.04).

Conclusion: Younger age, associated pain, and close proximity to physis are predictive of having a second UBC-related pathologic fracture.

Low Complication Rate Following Contemporary Pure Anteriorization Tibial Tubercle Osteotomy for Patellofemoral Overload

Nathan Varady, MD
The Hospital for Special Surgery

Purpose: To assess the safety of contemporary pure anteriorizing tibial tubercle osteotomy (aTTO) for patellofemoral overload.

Significance: While some cartilage lesions may theoretically be best addressed with pure aTTO, traditional aTTO techniques were associated with unacceptable complication rates, necessitating the need for a safer aTTO technique.

Methods: Consecutive patients undergoing a modern aTTO technique for isolated patellofemoral overload from 2016-2024 with minimum six-month follow-up were evaluated. The primary outcome was overall complication rate. Secondary outcomes included PROMs at two-years (among patients with minimum two-year follow-up).

Results: There were 57 patients with mean follow-up of 2.4 years; 68.4% underwent concomitant cartilage restoration. Mean anteriorization was 11.2±2.2 mm. The overall complication rate was 5.3%(3 patients), including two(3.5%) manipulations under anesthesia for arthrofibrosis and one(1.8%) superficial cellulitis successfully managed with oral antibiotics. There were significant improvements in mean IKDC(41.0 vs. 81.1, $p<0.001$) and VAS pain(4.6 vs. 1.6, $p<0.001$) scores from baseline to two-year follow-up.

Conclusion: Contemporary pure aTTO can be performed safely for isolated patellofemoral overload, with no instances of wound breakdown or nonunion/fracture encountered in this series. These finding suggest contemporary aTTO may be considered for patients with patellofemoral chondral wear who may not be ideal candidates for traditional TTO techniques.

Skeletal Age Assessment from Knee Radiographs Using Deep Learning

Joshua T. Bram, MD
The Hospital for Special Surgery

Purpose: We hypothesized that a highly accurate/reliable deep learning (DL) model for bone age estimation could be developed based on routinely available knee radiographs.

Significance: Management of children with knee pathologies relies on accurate maturity evaluation to guide appropriate intervention (e.g. physeal-sparing ACLR). Traditional bone age estimation requires unnecessary hand imaging/radiation for patients with knee imaging, and existing knee-based tools lack the accuracy/precision of hand grading systems.

Methods: A total of 2,374 knee radiographs from patients aged ≤18 years (with paired hand imaging within 3 months) were used. Patients with genetic disorders (including skeletal dysplasias/endocrinopathies) were excluded. A ConvNeXT model was trained using sex, skeletal age, and chronological age as inputs.

Results: The model achieved a mean absolute error (MAE) of 5.02 months from ground truth bone ages, half that determined using the knee-based abbreviated Fels method (9.59 months). An MAE of 3.43 months was observed relative to pseudolabels from a hand-based model that annotated the training set. Bland-Altman analysis revealed near-zero bias.

Conclusion: This highly accurate DL model demonstrates automated bone age estimation from knee radiographs is feasible, outperforming prior simple classifications/AI-based models. We anticipate this model can obviate the requirement for additional hand radiographs in patients with knee pathologies.

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Emory University
Incision or Excision? What to do with the A1 Pulley for Trigger Finger: Results of a Multi-Surgeon Randomized Controlled Trial

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Carolinas Medical Center/OrthoCarolina
Repair Technique and Fellowship Training Background Predict Major and Minor Complications after Achilles Tendon Repair

Tristan J. Elias, MD
University of Texas Medical Branch
Osteochondral Allograft Reaming Significantly Affects Chondrocyte Viability

Kyleen Jan, MD
Rush University Medical Center
THA-10 Score Predicts Conversion to Total Hip Arthroplasty After Hip Arthroscopy for Femoroacetabular Impingement Syndrome at Minimum 10-Year Follow-Up

Brian Shear, MD
University of Maryland
Your iPhone Knows How You Will Recover from Your Fracture

Presenters' Choice
Wade Karam, MD
UTHealth Houston, McGovern Medical School
Rapid Sequence MRI vs CT Capsular Width Sign for Detection of Occult Femoral Neck Fractures Associated with Femoral Shaft Fractures

Southwest Resident Research Symposium
UTHealth Houston,
McGovern Medical School, Houston
October 11, 2024

First Place Award Winner
J. Matthew Helm, MD
UTHealth Houston McGovern Medical School
The Effect of Anterior Closing Wedge Slope Reducing Osteotomy on Coronal Alignment – Considerations with Regards to Osteotomy Technique and Degree of Slope Correction

Second Place Award Winners
Tristan J. Elias, MD
University of Texas Medical Branch
Osteochondral Allograft Reaming Significantly Affects Chondrocyte Viability

Wade Karam, MD
UT Health Houston McGovern Medical School
Rapid Sequence MRI vs CT Capsular Width Sign for Detection of Occult Femoral Neck Fractures Associated with Femoral Shaft Fractures

Third Place Award Winners
Hayden Anz, MD,
UTHealth Houston McGovern Medical School
Biomechanical Analysis of Contact Pressures in Scaphotrapeziotrapezioid Arthritis

Kenneth Ford, MD
UTHealth Houston McGovern Medical School
Vascular Injury in Tibial Plateau Fractures: Incidence and Risk Factors

Guillermo R. Pechero Jr., MD
UTHealth Houston McGovern Medical School
Does Reduction Technique for Hip Fractures Matter? A Comparison of Closed, Open and Percutaneous Reduction Techniques in the Treatment of Intertrochanteric Femur Fractures

Presenters' Choice Award Winner
Ayane Rossano, MD
Dell Medical School at the University of Texas at Austin
Social Work Interventions Improve Outcomes in Total Joint Arthroplasty: An Effort to Improve Equity at an Urban Musculoskeletal Integrated Practice Unit

Southeast Resident Research Symposium
University of South Florida, Tampa
October 4, 2024

First Place Award Winner
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Emory University
Incision or Excision? What to do with the A1 Pulley for Trigger Finger: Results of A Multi-Surgeon Randomized Controlled Trial

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Benjamin Averkamp, MD
Carolinas Medical Center/OrthoCarolina
Repair Technique and Fellowship Training Background Predict Major and Minor Complications after Achilles Tendon Repair

John T. Wilson, MD
University of South Florida/Florida Orthopedic Institute
Conventional versus Robotic-Arm Assisted Medial Uni-compartmental Knee Arthroplasty: A-20-Year Analysis of Radiographic and Clinical Outcomes

Third Place Award Winners
Bradley Alexander, MD
University of Mississippi Medical Center
Comparison of Recent Trends in Medicare Utilization and Reimbursement for Cervical Spine Discectomy and Fusion Procedures Versus Cervical Disc Arthroplasty

Raahil Patel, MD
University of South Florida/Florida Orthopedic Institute
Early Success in Anterior Compartment Sparing Tibial Tubercle Osteotomy Utilizing Back-Cut Technique

Brittany Raymond, MD
University of Florida
Clinical Outcomes of Operative Management for Radial Tunnel Syndrome According to Surgical Approach: A Systematic Review

Presenters' Choice Award Winner
Aseel Dib, MD
Carolinas Medical Center/OrthoCarolina
Implant Selection in Distal Femur Fractures: An Analysis of Alignment and Outcomes

Western Resident Research Symposium
University of California, Los Angeles (UCLA)
September 4, 2024

First Place Award Winner
Seth Ahlquist, MD
University of California, Los Angeles (UCLA)
A Comparison of Total Knee Arthroplasty Outcomes Between Hemodialysis and Renal Transplant Patients

Second Place Award Winners
Molly A. Hulbert, MD
University of California, San Diego
A Community-Based Outreach Program Can Change Underrepresented Minority Student Perception of Orthopaedic Profession Fit and Attainability: Lessons from BONE Academy

Thomas E. Olson, MD
University of California, Los Angeles (UCLA)
Correction of Fixed Knee Flexion Deformity in Patients with Cerebral Palsy Using Suture Anchors for Anterior Distal Femur Hemi-Epiphysiodesis

Third Place Award Winners
Reinaldo E. Colon-Morillo, MD, LT, MC, USN
Naval Medical Center San Diego
Proximal Pole Scaphoid Fracture Nonunion Treated with Ipsilateral Hamate Transfer

Abhinav Sharma, MD
University of California, Irvine
Laminectomy with Fusion for Cervical Spondylotic Myelopathy is Associated with Higher Early Morbidity and Risk of Perioperative Complications Compared to Laminectomy Alone

Jonathan Yu, MD
University of California, Los Angeles (UCLA)
How Have Total Joint Arthroplasty Implant Prices Changed Compared to Overall Costs and Reimbursements?

Presenters' Choice Award Winner
Rishi Trikha, MD
University of California, Los Angeles (UCLA)
From the Lab to the Clinic: Angiotensin Converting Enzyme Inhibition May Incur Infectious Risk

Mid-Atlantic Resident Research Symposium
MedStar Georgetown, Washington, DC
May 11, 2024

First Place Award Winner
Brian Shear, MD
University of Maryland Medical Center
Your iPhone Knows How You Will Recover from Your Fracture

Second Place Award Winners
Alex Gu, MD
George Washington University
Can Hip and Knee Arthroplasty Surgeons Help Address the Osteoporosis Epidemic

Denver Burton Kraft, MD
Medstar Georgetown University Hospital
Minimally Displaced Lateral Humeral Condyle Fractures: Optimizing Follow-up and Minimizing Cost

Third Place Award Winners
William Johns, MD
Thomas Jefferson University Hospital/ Rothman Institute
Lower Opioid Prescription Quantity Does Not Negatively Impact Pain Control or Patient Satisfaction Following ACL Reconstruction: A Randomized, Prospective Trial

Matthew Kolevar, MD
University of Maryland Medical Center
Development of a Patient-Specific Cartilage Graft Using Magneti Resonance Imaging and 3D Printing

Matthew B. Weber, MD
Virginia Commonwealth University
Evaluation of Peripheral Nerve Perfusion in Tensioned Repairs

Presenters' Choice Award Winner
Micheal Raad, MD
Johns Hopkins Medicine
A New Morphologic Classification of Proximal Junctional Kyphosis Following Lower Thoracic to Pelvis Fusion in Adult Spinal Deformity Predicts Revision Surgery and Neurologic Complications

Midwest Resident Research Symposium
Rush University Medical Center, Rosemont, IL
May 3, 2024

First Place Award Winner
Kyleen Jan, MD
Rush University Medical Center
THA-10 Score Predicts Conversion to Total Hip Arthroplasty After Hip Arthroscopy for Femoroacetabular Impingement Syndrome at Minimum 10-Year Follow-up

Second Place Award Winners
Jonathan A. Ledesma, MD
University of Illinois at Chicago
A Prospective, Randomized Clinical Trial of Pedicle Lengthening Osteotomy Versus Open Decompression with Transforaminal Lumbar Interbody Fusion for Lumbar Degenerative Spondylolisthesis with Stenosis

Madeline Tiee, MD
Loyola University Medical Center
Sagittal Deformity of Garden Type I and II Geriatric Femoral Neck Fractures is Frequently Misclassified by Lateral Radiographs

Third Place Award Winners
Myles A. Atkins, MD
Rush University Medical Center
Risk Factors of Subchondral Insufficiency Fracture of the Knee in the Setting of Medial Meniscus Posterior Root Tears

Jordan Serotte, MD
University of Chicago
Time to Union in Ballistic vs. Blunt Pertrochanteric, Extra-Capsular Femur Fractures

Joseph Tanenbaum, MD
Northwestern McGaw Medical Center
The Natural History of Ulnar Collateral Ligament Injuries in Professional Baseball

Presenters' Choice Award Winners
Lohith Vatti, MD
University of Chicago
The Effect of Perioperative Dexamethasone on Functional Outcomes of Lower Extremity Long Bone Fracture Fixation

Luke Zabawa, MD
University of Illinois at Chicago
Knee Arthroplasty Reimbursement Dynamics: Inflation-Adjusted Analysis for 2006-2022

California Orthopaedic Association (Annual Meeting)
OREF Resident Award Winner

Emily Mills, MD
Keck School of Medicine University of Southern California
Preoperative Radiographic Findings Associated with Postoperative Spinopelvic Factors for Instability Following Total Hip Arthroplasty

OREF Edward C. McElfresh Awards for Best Resident Abstracts at Minnesota Orthopaedic Association Annual Meeting

Nicholas Reiners, MD
University of Minnesota
Outcomes of Geriatric Hip Fracture Patients with Associated Proximal Humerus Fracturs. Does Surgical Treatment of the Proximal Humerus Lead to Improved Mobility?

Austen Thompson, MD, PhD
Mayo Clinic*Impact of Intraoperative Periprosthetic Fractures During Cemented Hemiarthroplasty for Femoral Neck Fractures*