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OREF SOUTHEAST REGION
RESIDENT RESEARCH SYMPOSIUM
Monday, March 31, 2025

University of Miami
Newman Alumni Center
6200 San Amaro Drive
Coral Gables, Florida

Hosted by:
Francis J. Hornicek, MD, PhD, FAAOS, FORS
Professor and Chair, Department of Orthopaedics
Co-Leader, Sarcoma Multidisciplinary Care Group
Director of Chordoma Program and Spine Oncology
Sylvester Comprehensive Cancer Center
University of Miami Miller School of Medicine

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 SOUTHEAST REGION RESIDENT RESEARCH SYMPOSIUM
SUMMARY AGENDA
Monday, March 31, 2025

12:55 p.m. – 1:00 p.m.	**Welcome and Introductions** Francis J. Hornicek, MD, PhD, FAAOS, FORS Professor and Chair, Department of Orthopaedics Co-Leader, Sarcoma Multidisciplinary Care Group Director of Chordoma Program and Spine Oncology Sylvester Comprehensive Cancer Center University of Miami Miller School of Medicine
1:00 p.m. – 1:10 p.m.	**OREF Welcome** Lee Grossman, MBA, ML, CAE Chief Executive Officer Orthopaedic Research and Education Foundation
1:10 p.m. – 1:44 p.m.	**Session I – Resident Research Presentations & Discussion** **Trauma**
1:44 p.m. – 2:24 p.m.	**Session II – Resident Research Presentations & Discussion** **Joint Reconstruction**
	Break – *Please submit your scores from Sessions I and II to OREF Staff*
2:34 p.m. – 3:08 p.m.	**Session III – Resident Research Presentations & Discussion** **Sports Medicine, Rehabilitation, Technology**
3:08 p.m. – 3:36 p.m.	**Session IV – Resident Research Presentations & Discussion** **Spine, Hand and Occupational Health**
	Break – *Please submit your scores from Sessions III and IV to OREF Staff*
3:46 p.m. – 3:49 p.m.	**Introduction of Keynote Speaker**
3:49 p.m. – 4:35 p.m..	**Keynote Address** *Prosthetic Joint Infection – A 40-year Learning Experience* Thomas K. Fehring, MD Retired Co-Director OrthoCarolina Hip and Knee Center
4:35 p.m. – 4:50 p.m.	**Keynote Question & Answer**
4:50 p.m. – 5:00 p.m.	**Closing Remarks and Awards Presentation** Awards reception immediately following the program

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KEYNOTE SPEAKER

Thomas K. Fehring, MD

Retired, Co-Director
OrthoCarolina and Hip & Knee Center

Dr. Thomas Fehring graduated cum laude from Wake Forest University where he played varsity football and received an NCAA postgraduate scholarship for excellence in athletics and academics. He completed his orthopedic residency at Vanderbilt University and completed a fellowship in Adult Reconstructive Surgery in Boston.

Dr. Fehring helped establish the OrthoCarolina Hip and Knee Center where he has practiced for nearly 40 years. During that time, he has been involved in teaching residents and fellows and helped establish the OrthoCarolina Research Institute. Dr. Fehring has authored over 160 peer reviewed publications and has given nearly 400 academic presentations. In 2019, Dr. Fehring helped establish the OrthoCarolina Periprosthetic Joint Infection Center to improve outcomes and provide evidence-based guidance for prosthetic joint infections. He is also the Director of the OrthoCarolina Charitable Foundation, which supports educational programs for the needy locally and internationally.

Dr. Fehring's clinical interests are in revision hip and knee arthroplasty. His research has focused on revision surgery, prosthetic design, osteolysis and infection. Dr. Fehring has served as president of The Knee Society and American Association of Hip and Knee Surgeons. He is also an active member of The Hip and Knee Societies.

Judges

Thomas K. Fehring, MD
OrthoCarolina Hip and Knee Center

Francis J. Hornicek, MD, PhD
University of Miami
Miller School of Medicine

Michael G. Rizzo, Jr., MD
University of Miami
Miller School of Medicine

OREF Southeast Resident Research Symposium
DETAILED AGENDA
Monday, March 31, 2025

12:55 p.m. – 1:00 p.m.	**Welcome and Introductions** Francis J. Hornicek, MD, PhD, FAAOS, FORS Professor and Chair, Department of Orthopaedics Co-Leader, Sarcoma Multidisciplinary Care Group Director of Chordoma Program and Spine Oncology Sylvester Comprehensive Cancer Center University of Miami Miller School of Medicine
1:00 p.m. – 1:10 p.m.	**OREF Welcome** Lee Grossman, MBA, ML, CAE Chief Executive Officer Orthopaedic Research and Education Foundation
	Session I – Presentations and Discussion **Trauma**
1:10 p.m. – 1:16 p.m.	*Do Local Antibiotics Reduce Fracture-related Infections in Distal Femur Fractures?* Alexander B. White, MD, Atrium Health Carolinas Medical Center
1:16 p.m. – 1:22 p.m.	*Surgical Outcomes of Pediatric Osteosarcoma Patients Treated with an Allograft Reconstruction Revised to an Endoprosthesis* William Pavlis, MD, University of Miami
1:22 p.m. – 1:28 p.m.	*Analysis of Traumatic versus Atraumatic Compartment Syndrome of the Upper Extremity* Alexander C. Hafey, MD, Medical University of South Carolina
1:28 p.m. – 1:34 p.m.	*Weightbearing After Distal Femur Fractures: Does the Surgeon's Postoperative Protocol Matter?* Blake H. Hodgens, MD, Atrium Health Carolinas Medical Center
1:34 p.m. – 1:44 p.m.	**Question and Answer**
	Session II – Resident Research Presentations & Discussion **Joint Reconstruction**
1:44 p.m. – 1:50 p.m.	*Higher Opioid Use in Two-Stage vs One-Stage Exchange for Periprosthetic Joint Infection: A Randomized Controlled Trial* *Calvin Chandler, MD, Atrium Health Carolinas Medical Center*
1:50 p.m. – 1:56 p.m.	*Prediabetes as an Unrecognizable Risk Factor for Inpatient Postoperative Complications after Total Knee Arthroplasty* Aneesh V. Samineni, MD, Jackson Memorial Hospital/University of Miami
1:56 p.m. – 2:02 p.m.	*Predicting Postoperative Complications in Total Joint Arthroplasty: The Role of the NarxCare Overdose Score* Kevin Orton, MD, Jackson Memorial Hospital/University of Miami

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OREF Southeast Region Resident Research Symposium
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Monday, March 31, 2025

2:02 p.m. – 2:08 p.m.	*Tracking Wearable Device Compliance in Total Knee Arthroplasty Recovery* Joseph Geller, MD, Jackson Memorial Hospital/University of Miami
2:08 p.m. – 2:14 p.m.	*Variations in Coronal Plane Alignment of the Knee: Insights in the Hispanic Population* Juan Lopez, MD, Jackson Memorial Hospital/University of Miami
2:14 p.m. – 2:24 p.m.	**Question and Answer**
	Break - *Please submit your scores from Sessions I and II to OREF Staff*
	Session III – Presentations and Discussion **Sports Medicine, Rehabilitation, Technology**
2:34 p.m. – 2:40 p.m.	*Targeted Brain Rehabilitation: A Novel Virtual Reality Protocol for Phantom Limb Pain Following Upper Extremity Amputation* Ryan Serbin, MD, Atrium Health Carolinas Medical Center
2:40 p.m. – 2:46 p.m.	*Early Implementation of Virtual Reality Therapy for Phantom Limb Pain: A Feasible and Effective Adjunct to Traditional Interventions* James Frix, MD, Atrium Health Carolinas Medical Center
2:46 p.m. – 2:52 p.m.	*When the Robot Fails Us: A Comprehensive Analysis of a United States Food and Drug Administration Database of Technology-Assisted Arthroplasty* David S. Constantinescu, MD, University of Miami
2:52 p.m. – 2:58 p.m.	*Impact of Infrapatellar Fat Pad Injury Severity on Subsequent Patellofemoral Cartilage Degeneration Following Acute ACL Tear* Selina Deiparine, MD, University of Miami/Jackson Health System
2:58 p.m. – 3:08 p.m.	**Question and Answer**
	Session IV – Resident Research Presentations & Discussion **Spine, Hand and Occupational Health**
3:08 p.m. – 3:14 p.m.	*The Impact of Short-Term Postoperative Corticosteroids on Postoperative Outcomes in Cervical Spine Surgery* Janice M. Bonsu, MD, Emory University
3:14 p.m. – 3:20 p.m.	*Nerve Transfers for Cervical Spine Pathology: Restoring Shoulder and Elbow Function in Instances of Cervical Radiculopathy and Post-Operative Palsy* Aseel Dib, MD, Carolinas Medical Center
3:20 p.m. – 3:26 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
3:26 p.m. – 3:46 p.m.	**Question and Answer**
	Break – *Please submit your scores from Sessions III and IV to OREF Staff*

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Do Local Antibiotics Reduce Fracture-related Infections in Distal Femur Fractures?

Alexander B. White, MD
Atrium Health Carolinas Medical Center

Purpose: To evaluate effectiveness of local antibiotics at reducing fracture-related infections (FRIs) in distal femur fractures.

Significance: Evidence has shown local antibiotics reduce FRIs in distal tibia fractures. Efficacy of local antibiotics in distal femur fractures is less well understood but hypothesized to achieve similar results.

Methods: Retrospective cohort study at a single urban Level I Trauma Center of patients treated operatively with definitive fixation for OTA 33 distal femur fractures between 2018-2022 with ≥6-month follow-up or diagnosed FRI at a single center. The primary outcome was fracture-related infection (deep and superficial). Secondary outcomes included microbiological profiles, nonunion, and reoperation rates.

Results: There were 135 patients included with 41 receiving local antibiotics and 94 not receiving local antibiotics. There were five deep fracture-related infections in the local antibiotics cohort compared to two in those not receiving local antibiotics. No significant reduction in infection rate was observed in all fractures or when only open fractures were evaluated (p=.19).

Conclusion: There was no improvement in FRI rate in distal femur fractures treated with local antibiotics. Larger prospective studies based on fracture location are needed to definitively evaluate the efficacy and optimal indications for local antibiotic delivery.

Surgical Outcomes of Pediatric Osteosarcoma Patients Treated with an Allograft Reconstruction Revised to an Endoprosthesis

William Pavlis, MD
University of Miami

Purpose: Examine differences in outcomes of pediatric osteosarcoma patients who underwent revision to an all-metal endoprosthesis following initial biologic reconstruction compared to patients primarily treated with an endoprosthesis.

Significance: Limb salvage with allograft reconstruction remains a viable treatment option for pediatric osteosarcoma patients with certain indications; however, there is little available research on the outcomes of managing challenging complications.

Methods: A retrospective cohort study of patient demographics, primary revision indications, revision surgery characteristics, and surgical, functional, and patient-reported outcomes among pediatric osteosarcoma patients with allografts revised to endoprostheses or treated primarily with an endoprosthesis at a single institution from 1997-2022.

Results: 10 allograft revision and 44 primary endoprosthesis patients with a median follow-up of 5.6 years were included. Among allograft revision patients, 4 (40%) had failure of limb salvage per Henderson criteria and 3 (30%) required further revision, including 2 amputations. However, there were no significant differences in range of motion, MSTS score, limb salvage failure rates, and revision rates between the two groups.

Conclusions: Revising pediatric osteosarcoma patients to all-metal endoprostheses following initial biologic reconstruction presents a complex, but viable option associated with a significant complication rate. Despite these challenges, a majority of patients achieved satisfactory functional outcomes.

Analysis of Traumatic versus Atraumatic Compartment Syndrome of the Upper Extremity

Alexander C. Hafey, MD
Medical University of South Carolina

Purpose: The purpose of this study is to evaluate outcomes following upper extremity decompressive fasciotomy for traumatic (TUECS) and atraumatic (AUECS) upper extremity compartment syndromes. We hypothesize that patients with TUECS will exhibit increased risk of postoperative complications.

Significance: Both TUECS and AUECS are limb-threatening conditions with high morbidity. However, their differences in risk factors and outcomes remain unclear.

Methodology: The TriNetX global research network was queried from 2014–2024. Two cohorts were identified via ICD and CPT codes—2,423 TUECS and 1,382 AUECS patients—with patients under 18 excluded. Propensity score matching for age, sex, BMI, ethnicity, race, and comorbidities yielded 1,149 patients per group. Outcomes were assessed at 30 days, 3 months and 1 year.

Results: TUECS patients were younger and predominantly male. AUECS patients tended to have more medical comorbidities. After matching, TUECS had significantly higher rates of wound dehiscence and reoperation and at all timepoints, whereas AUECS patients experienced a higher rate of sepsis at 30 days and cardiac arrest at 3 months and 1 year. There were no significant differences in readmission or mortality.

Conclusion: TUECS was associated with higher wound dehiscence and reoperation rates while the AUECS cohort had higher medical postoperative complications.

Weightbearing After Distal Femur Fractures: Does the Surgeons Postoperative Protocol Matter?

Blake H. Hodgens, MD
Atrium Health Carolinas Medical Center

Purpose: To investigate factors that increase complications in OTA 33 fractures, hypothesizing that postoperatively assigned weightbearing would not increase adverse outcomes.

Significance: Optimal weightbearing protocol after surgical fixation of OTA33 fractures remains controversial, with limited evidence to guide surgeons preference.

Methods: Retrospective cohort study from 2018-2022 of operative OTA 33 distal femur fractures including 137 patients (>18 years old) with a minimum 6-month follow-up. Patients categorized according to surgeons' postoperative protocols: weightbearing-as-tolerated (n=38) or restricted weightbearing (n=99). Multivariable logistic regression analyzed the association of weightbearing protocol with complications, adjusting for key variables.

Results: The WBAT group was older (60.5 vs 55), predominantly female (76% vs 47%), and had more low-energy injuries (79% vs 36%) than the RWB group. WBAT patients had faster time to union (mRUST > 10) (209.5 vs 365 days) and higher union rates by 6 months (16% vs 4%). Changes in coronal and sagittal alignment were similar between groups. Closed fracture status was the only significant predictor of lower complication. Weightbearing protocol was not a significant predictor of complications.

Discussion and Conclusion: Closed fracture was the sole independent predictor of lower complication risk, suggesting soft tissue injury, rather than weightbearing protocol, may primarily drive adverse outcomes.

Higher Opioid Use in Two-Stage vs One-Stage Exchange for Prosthetic Joint Infection: A Randomized Controlled Trial

Calvin Chandler, MD
Atrium Health Carolinas Medical Center

Purpose: To compare opioid consumption patterns between one and two-stage revision arthroplasty procedures in the treatment of periprosthetic joint infection (PJI).

Significance: As total joint arthroplasty volumes increase, understanding opioid use patterns in PJI treatment becomes crucial for optimizing pain management and patient outcomes. Two-stage revision has been the gold standard, but one-stage procedures are gaining attention as a viable alternative.

Methods: A post hoc analysis of a RCT examined opioid consumption in 119 patients (58 one-stage, 61 two-stage) who met MSIS criteria for PJI. Total opioid use was assessed from the preoperative period through 12-months postoperatively, with all quantities converted to milligram morphine equivalents (MME).

Results: Total MME was significantly higher in two-stage versus one-stage procedures (1162.5 vs 732.5, p=0.0485), primarily due to between-stage consumption. No significant differences were found in preoperative (573.8 vs 420.0, p=0.2423) or one-year postoperative use (1125 vs 950.1, p=0.4448). Preoperative opioid use correlated with higher postoperative consumption at three months (835 vs 500 MME, p=0.0159) regardless of surgical approach.

Conclusion: While long-term opioid use was similar between groups, two-stage revision was associated with higher total opioid consumption, primarily attributed to the between-stages period. Preoperative opioid use predicted higher postoperative consumption regardless of surgical approach.

Prediabetes as an Unrecognized Risk Factor for Inpatient Postoperative Complications after Total Knee Arthroplasty

Aneesh V. Samineni, MD
Jackson Memorial Hospital/University of Miami

Purpose: To compare rates of perioperative complications and resource utilization between patients with and without prediabetes undergoing total knee arthroplasty (TKA).

Significance: Diabetes is a well-established risk factor for a multitude of adverse outcomes in TKA. However, the effects of prediabetes on patient outcomes have yet to be fully examined.

Methodology: A retrospective cohort study was performed using a large national database to identify patients with and without prediabetes undergoing unilateral, primary, elective TKA from 2017 to 2020. Coarsened exact matching was performed to match patients with prediabetes to patients without prediabetes 1:1. There were a total of 65,330 patients, with half in each cohort.

Results: For patients undergoing TKA, prediabetes was associated with higher rates of respiratory failure (0.4 vs 0.3%), aspiration pneumonitis (0.05 vs 0.02%), postoperative urinary retention (2.4 vs 2.0%), constipation (3.7 vs 2.8%), nausea and vomiting (3.3 vs 3.0%), anemia (15.0 vs 12.9%), hypotension (3.1 vs 2.2%), wound dehiscence (0.03 vs 0.00%), and infection (0.11% vs 0.05%) compared to patients without prediabetes. Having prediabetes was also associated with increased total costs ($17,197 vs $15,544).

Conclusions: After TKA, patients with prediabetes were associated with higher rates of perioperative complications and increased costs compared to patients without prediabetes.

Predicting Postoperative Complications in Total Joint Arthroplasty
The Role of the NarxCare Overdose Score

Kevin Orton, MD
Jackson Memorial Hospital/University of Miami

Purpose: To investigate if patients with higher Narxcare Scores (NCSs) will have significantly higher rates of postoperative complications following total joint arthroplasty (TJA).

Significance: The NCS is a risk assessment tool to evaluate potential overdose risks based on a patient's prescription history. While its utility in identifying at-risk patients is well-documented, its association with clinical outcomes, such as emergency department visits and hospital readmissions following TJA remains unclear.

Methods: This retrospective cohort study included patients who underwent primary total hip or knee arthroplasty. Patients' preoperative NCSs were stratified into four ranges. Logistic regression analysis was used to assess the association between NCSs and the likelihood of 90-day readmission.

Results: Of 2,016 patients, 8% visited the ED within 90 days postoperative, and 4% were readmitted within 90 days. Logistic regression revealed that patients with higher NCSs had significantly increased odds of a 90-day ED visit (OR 1.45 [95% CI 1.19-1.76; p=<.001]) and 90-day all-cause readmission (OR 1.36 [95% CI 1.05-1.78; p=.023]).

Conclusion: Higher preoperative NarxCare overdose scores are linked to increased 90-day ED visits and readmissions. This suggests that NarxCare scores could help identify high-risk patients and guide targeted interventions, such as improved discharge planning and postoperative monitoring.

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.

Variations of Coronal Plane Alignment of the Knee: Insights in the Hispanic Population

Juan Lopez, MD
Jackson Memorial Hospital/University of Miami

Introduction: The Coronal Plane Alignment of the Knee (CPAK) classification identifies patients who would benefit from kinematic alignment (KA) in total knee arthroplasty (TKA). While ethnic differences affect knee alignment, CPAK characterization of the Hispanic population is lacking. Our aim is to apply the CPAK classification to this group.

Methods: A retrospective chart review of 254 Hispanic TKA patients was conducted. Leg length radiographs were obtained, excluding those with prior arthroplasty. Radiographic measurements, including lateral distal femoral angle (LDFA), medial proximal tibial angle (MPTA), and the arithmetic hip-knee-ankle (aHKA) angle, were used to classify 457 knees into CPAK Types I-IX.

Results: Most knees were classified as CPAK Type I (varus aHKA, apex distal JLO) at 36.1%, followed by Type II (neutral aHKA, apex distal JLO) at 23.9%, and Type III (valgus aHKA, apex distal JLO) at 19.9%. A total of 79.9% had an apex distal JLO, with 45.9% showing varus alignment. Only 4.6% were CPAK Type V, indicating low prevalence of neutral alignment.

Conclusion: Hispanic patients predominantly exhibit non-neutral knee alignments, with varus and apex distal phenotypes predominating. Personalized surgical approaches may be more appropriate than traditional mechanical alignment. Further studies are needed to refine CPAK for diverse ethnic groups.

Targeted Brain Rehabilitation: A Novel Virtual Reality Protocol for Phantom Limb Pain Following Upper Extremity Amputation

Ryan Serbin, MD
Atrium Health Carolinas Medical Center

Purpose: To evaluate Targeted Brain Rehabilitation (TBR), a novel virtual reality-based intervention for phantom limb pain (PLP) designed to complement surgical techniques by addressing central pain mechanisms while improving functional outcomes.

Significance: While surgical interventions effectively target peripheral mechanisms of PLP, central cortical reorganization remains challenging. TBR provides surgeons a structured rehabilitation protocol targeting specific cortical regions implicated in PLP pathophysiology.

Methodology: Seventeen upper extremity amputees participated in this single-session feasibility study. The TBR protocol comprised four sequential phases targeting distinct cortical regions. Outcomes included pain scores, system usability, patient satisfaction, and potential impact on narcotic use.

Results: Pain levels decreased significantly (NPRS: 4.6±3.1 to 2.3±2.1, $p=0.0014$), with high patient satisfaction (8.9±1.2/10) and strong peer recommendation ratings (9.6±1.0/10). The system demonstrated excellent usability (SUS: 86.8±11.5) with minimal simulator sickness (SSQ: 10.0±25.7). Notably, 68.4% indicated earlier TBR access might have reduced narcotic use, suggesting potential for improved post-surgical rehabilitation outcomes.

Conclusion: TBR shows promise as a non-pharmacological adjunct to surgical management of PLP, potentially enhancing functional outcomes while reducing narcotic dependence. These findings warrant investigation through controlled trials to establish its role in comprehensive post-amputation care.

Early Implementation of Virtual Reality Therapy for Phantom Limb Pain: A Feasible and Effective Adjunct to Traditional Interventions

James Frix, MD
Atrium Health Carolinas Medical Center

Purpose: Phantom limb pain (PLP) significantly impacts amputees' quality of life despite interventions like Targeted Muscle Reinnervation (TMR) and Regenerative Peripheral Nerve Interface (RPNI). This study hypothesized that immediate postoperative virtual reality (VR) therapy could manage acute PLP without usability issues or adverse effects.

Significance: PLP arises from central and peripheral mechanisms, with limited targeted treatments available for central drivers like cortical reorganization. VR therapy offers an immersive tool for managing PLP but remains underexplored in the immediate postoperative phase.

Methodology: A 52-year-old female underwent quadruple amputation with TMR and RPNI for pressor-induced necrosis. VR therapy began on postoperative day one and continued for 10 weeks. Pain was assessed using the Numeric Pain Rating Scale, Phantom Limb Experience and VR Feedback surveys. System Usability Score (SUS) and Simulator Sickness Questionnaire (SSQ) evaluated usability/feasibility.

Results: PLP intensity decreased from 8–9/10 to 2/10 during VR sessions. She rated VR therapy as equally effective as opioids (8/10) but preferred VR, citing a willingness to use it regularly (5/5). High usability (SUS 80/100) and absence of adverse effects (SSQ 0) were noted. At 8 months, PLP frequency/intensity were reduced.

Conclusion: Early VR therapy appears to be a feasible, effective adjunct for managing acute PLP and merits further study.

When the Robot Fails Us: A Comprehensive Analysis of a United States Food and Drug Administration Database of Technology-Assisted Arthroplasty

David S. Constantinescu, MD
University of Miami

Purpose: To categorize adverse events (AEs) associated with robotic-assisted arthroplasty and calculate their annual incidence.

Significance: Robotic-assisted arthroplasty is a growing alternative to conventionally instrumented arthroplasty; however, the incidence of AEs associated with this technology reported to the United States Food and Drug Administration (FDA) remains poorly quantified

Methodology: The FDA's Manufacturer and User Facility Device Experience database was queried for AEs from January 1, 2017 to December 31, 2021 associated with the most prevalent robotic-arthroplasty system. The AEs were calculated using national surgical numbers provided by the manufacturer.

Results: There were 1,710 unique AEs across the study period, with 436 total hip arthroplasty (THA), 1,005 total knee arthroplasty (TKA), and 269 partial knee arthroplasty (PKA), representing incidence rates of 0.37, 0.30, and 0.40%, respectively. All procedures demonstrated lower rates of AEs in the final year of the study, compared to the first year. Most complications were related to mechanical problems, not software issues. No cases were canceled due to AEs in THA. Patient injuries occurred in 0.05, 0.05, and 0.08% of THA, TKA, and PKA, respectively.

Conclusion: Robotic-assisted arthroplasty has a small number of AEs reported to the FDA, with rates steadily decreasing over the study period.

Impact of Infrapatellar Fat Pad Injury Severity on Subsequent Patellofemoral Cartilage Degeneration Following Acute ACL Tear

Selina Deiparine, MD
University of Miami/Jackson Health System

Purpose: This study investigates the relationship between infrapatellar fat pad (IFP) injury severity in acute anterior cruciate ligament (ACL) tears and future development of patellofemoral compartment (PFC) chondrosis, as the IFP plays an important role in knee joint homeostasis with structural and immune-modulating properties.

Significance: This study elucidates a relationship between the severity of IFP edema after acute injury and long-term cartilage degeneration, which has implications for prognostication after ACL injury.

Methods: MRIs within 4 weeks post-injury were assessed for IFP edema and preoperative PFC, with follow-up MRIs within 2 years of ACL reconstruction surgery for postoperative PFC. The relationship between the initial IFP edema and future PFC progression was analyzed.

Results: A significant positive correlation was found between initial IFP injury severity and future PFC chondrosis progression ($n = 69$, $r = 0.44$, $P<0.001$). A significant difference in PFC progression was observed between grade 1 and grade 2 IFP injuries ($P = 0.001$), but no difference was noted between grade 2 and grade 3 IFP injuries ($P = 0.72$).

Conclusion: The severity of IFP injury is linked to the development of PFC chondrosis following ACL injury, suggesting a potential role in prognostication after ACL tears.

The Impact of Short-Term Postoperative Corticosteroids on Postoperative Outcomes in Cervical Spine Surgery

Janice M. Bonsu, MD
Emory University

Purpose: To assess postoperative complication rates in patients with and without steroid prescriptions following cervical spine surgery.

Significance: Cervical spine stenosis is an age-related condition often treated surgically in severe cases. Short-term corticosteroids are commonly used postoperatively to reduce inflammation and pain, but their impact on medical and surgical complications remain unclear. This study examines the association between short-term postoperative corticosteroid use and 90-day complications in cervical spine surgery patients.

Methods: Using the Merative MarketScan database, cervical spine surgeries from 2009 to 2021 were identified. Those patients with postoperative steroid prescriptions (methylprednisolone, prednisolone, and dexamethasone) dispensed within six weeks were compared to non-steroid patients. Chronic steroid users were excluded. Complications and dose-response analysis were analyzed using chi-square and linear regression.

Results: Among the 247,368 surgical encounters, 34,577 patients (13.97%) received steroids, with methylprednisolone being the most prescribed (67.2%). These patients had higher rates of complications, including septic pulmonary embolism (1.69% vs. 1.47%, $p = 0.001$), infections other than surgical site infection (1.72% vs. 0.99%, $p < 0.001$), pulmonary embolism/thrombosis (3.41% vs. 3.17%, $p = 0.02$), and wound disruption (0.94% vs. 0.70%, $p < 0.001$).

Conclusion: Postoperative corticosteroid use is associated with minimal but significant increases in complication rates. While effective for managing inflammation, surgeons should weigh these risks against benefits when prescribing steroids.

Nerve Transfers for Cervical Spine Pathology: Restoring Shoulder and Elbow Function in Instances of Cervical Radiculopathy and Post-Operative Palsy

Aseel Dib, MD
Carolinas Medical Center

Purpose: Demonstrate the utility of nerve transfers for cervical spine pathologies, including post operative palsies as well as pure cervical radiculopathy failing to resolve with decompressive surgery.

Significance: First report of utilizing nerve transfer for radiculopathy in the literature.

Methods: Retrospective review of patients who underwent peripheral nerve transfer for cervical spine etiology at a single institution. A total of 8 patients were included: 5 patients with post operative palsy of C5-C6 and 3 patients with cervical radiculopathy. Patients completed serial follow-up visits where physical examination testing of upper extremity function was repeated and patient reported outcomes questionnaires were collected

Results: Post-operatively, 6/8 cases showed at least M3 strength in shoulder abduction, with 3 instances of M4 function or better at an average of 409 days follow up (SD ± 251). All but one patient showed improvement in elbow flexion following nerve transfer, with 5/7 patients showing at least M4 function at an average 350 days (SD ± 151) follow up.

Conclusion: Peripheral nerve transfer represents a viable treatment option for patients demonstrating upper extremity motor weakness of cervical origin without improvement in 4-5 months.

Supplemental tables: **Table 1**: Presentation of Case Summaries

Case	Age	Sex	Lat.	Etiology	C-Spine Procedure	Indication	Symptom Onset	Spine Surgery to NT (Days)	Pre-Op EMG	Nerve Transfers	Repair Fashion	Complications
1	59	M	R	Post-op Palsy (C5)	PCF	Cervical Spinal Stenosis	Unclear	192	Delt: 0 polyphasics Biceps: 0 polyphasics	A. Somsak's B. Oberlin	A. End-to-End B. End-to-End (x2)	None
2	67	M	L	Post-op Palsy (C5)	PCDF (C3-C7)	Cervical Stenosis and Radiculopathy with Myelopathy	POD 0	213	C5-C6 Radiculopathy	A. Somsak's B. Oberlin	A. Reverse End-to Side B. End-to-End (x2)	None
3	62	M	L	Post-op Palsy (C5-C6)	Posterior C3 Laminectomy & C4-C6 Laminoplasty	Cervical Spinal Stenosis	<POD 4	183	C5 Radiculopathy	A. SAN to SSN B. Somsak's C. Oberlin	A. End-to-End B. End-to-End C. End-to-End	None
4	77	M	L	Post-op Palsy (C5)	PCDF (C3-C6)	Cervical Spondylotic Myelopathy	Unclear	268	C5 Radiculopathy	A. Somsak's B. Oberlin	A. End-to-End B. End-to-Side/ End-to-End	None
5	64	F	L	Post-op Palsy (C5-C8)	PCDF (C2-T1) & Lami-nectomy (C2-C3, C6-C7)	Cervical Stenosis with Myelopathy	POD 0	202	Radiculopathy (Chronic C6-C7) (Subacute C5)	A. Somsak's B. Oberlin	A. End-to-End B. End-to-End (x2)	None
6	47	M	L	Radiculopathy (C5)	ACDF (C4-C6)	C4-C5 Disc Herniation	Post-herniation; 1 week pre-ACDF; 7 mo. pre-NT	196	C5-C6 Radiculopathy (Acute to sub-acute)	A. Somsak's	A. Reverse End-to Side	None
7	65	M	R	Radiculopathy (C5-C6)	ACDF (C4-C6)	Cervical Radiculopathy	6 mo. Pre-NT; 8 mo. pre ACDF	-70	C5-C6 Radiculopathy	A. Somsak's B. Oberlin	A. Reverse End-to Side B. End-to-End (x2)	None
8	60	M	R	Radiculopathy (C5-C6)	ACDF (C4-C6)	Cervical Radiculopathy	10 mo pre-NT; 13 mo. pre ACDF	-50	C5-C6 Radiculopathy (Sub-acute to Chronic)	A. Somsak's B. Oberlin	A. End-to-End B. End-to-Side/ End-to-End	I&D of Seroma

Abbreviations: NT, Nerve Transfer; EMG, Electromyogram; PCDF, Posterior Cervical Decompression and Fusion; ACDF, Anterior Cervical Decompression and Fusion; POD, Post-operative Day; SAN, Spinal Accessory Nerve; SSN Suprascapular Nerve; I&D, Incision and Drainage

Notes:

Somsak's = Triceps (Radial Nerve) to Deltoid (Axillary Nerve)

Oberlin = Ulnar/Median Fascicular to Brachialis/Biceps

Table 2: Somsak Nerve Transfer Physical Exam Findings:

Case #	Age	Etiology	Construct	Spine Surgery To NT (Days)	Shoulder Abduction		
					Pre-Op	Post-Op (Max)	Days to Max
1	59	Post-op Palsy (C5)	End to End	192	*0*	*5*	2708*
2	67	Post-op Palsy (C5)	R. End to Side	213	*0*	*3*	559
3	62	Post-op Palsy (C5-C6)	End to End	183	*0*	*3*	761*
4	77	Post-op Palsy (C5)	End to End	268	*0*	*0*	139**
5	64	Post-op Palsy (C5-C8)	End to End	202	*0*	*3*	279
6	47	Radiculopathy (C5)	R. End to Side	196	*3*	*4*	125
7	65	Radiculopathy (C5-C6)	R. End to Side	-70	*2*	*5*	671
8	60	Radiculopathy (C5-C6)	End to End	-51	*2*	*0*	439**

*Denotes required subsequent orthopedic surgery or surgeries (IE rotator cuff or non-union surgery)
**Denotes days to final follow-up for patients who failed to demonstrate motor recovery
Abbreviations: NT, Nerve Transfer; R. End to Side, Reverse End to Side

Table 3: Oberlin Nerve Transfer Exam Findings

Case #	Age	Etiology	Construct[1]	Spine Surgery to NT (Days)	Elbow Flexion		
					Pre-Op	Post-Op (Max)	Days to Max
1	59	Post-op Palsy (C5)	End to End	192	*0*	*5*	337
2	67	Post-op Palsy (C5)	End to End	213	*0*	*1*	559
3	62	Post-op Palsy (C5-C6)	End to End	183	*0*	*4*	482
4	77	Post-op Palsy (C5)	Hybrid	268	*2*	*2*	139**
5	64	Post-op Palsy (C5-C8)	End to End	202	*0**	*4*	279
7	65	Radiculopathy (C5-C6)	End to End	-70	*3**	*4*	307
8	60	Radiculopathy (C5-C6)	Hybrid	-51	*0*	*4**	136

Patient 6 did not receive an Oberlin transfer but did undergo Somsak transfer as seen in "Table 2"
*Denotes trick motion present (Steindler or Reverse Steindler)
** Denotes days to final follow-up for patients who failed to demonstrate motor recovery
[1]'End to end' designates that both ulnar/median nerve to brachialis/biceps coaptations were done in this fashion; 'Hybrid' means that both one end to end and one end to side repair methods were utilized.
Abbreviations: NT, Nerve Transfer

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

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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.

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