

21st Annual Robert D. D'Ambrosia Lectureship & Research Day



(L-R) Chief Residents: Austin Broussard MD, Adam Miller MD, Adam Haydel MD, and Nathan Redlich MD

Saturday, June 21, 2025

LSUHSC School of Medicine
Center for Advanced Learning and Simulation (CALs)
2021 Perdido Street | New Orleans, LA 70112

The Lectureship and Research is named in honor of
Robert D. D'Ambrosia, M.D.



This annual lecture and department chairmanship has been established to honor Dr. D'Ambrosia's service to the LSU Health Department of Orthopaedic Surgery. In his 30+-year as the Department Chair, he exemplified leadership and humanity while training and mentoring more than 100 graduates. We are very grateful for Dr. D's contributions to LSU and to the department. Now in its 19th year, we continue to honor his legacy through the annual Robert D. D'Ambrosia Lectureship & Research Day.

AGENDA

7:30 am – 8:00 am

Breakfast and Poster Viewing

Posters will be displayed outside the lecture hall near the food service

8:05 am – 8:15 am

Introduction: Vinod Dasa, MD, Director of Orthopaedic Research

8:15 am – 8:20 am

Andrew King, MD

8:20 am – 8:40 am

Robert D. D'Ambrosia, MD

8:45 am – 9:05 am

Chief Resident Presentations

Adam Haydel MD

Multicenter Comparison of Outcomes for Management of GSW Humerus Fractures

Austin Broussard MD

Minimally Invasive Methods for Adolescent Intraarticular Distal Humerus Fractures with an Intact Column

Adam Miller MD

Does postoperative immobilization affect final alignment of pediatric femur fractures treated with flexible intramedullary nailing?

Nathan Redlich MD

Intraoperative Vertebral Artery Injury: Evaluation, Management, and Prevention

9:15 am – 9:30 am

Faculty Speaker: Jason Mussell PhD

Professor – Research, Department of Cell Biology and Anatomy, LSU

Partnering for Progress: A Preclinical Educator's Journey in Collaborative Publication and Skill Development

9:30 am – 9:45 am

Baton Rouge Update: Neil Johansen PhD

Robert and Patricia Hines Endowed Professor, Department of Kinesiology, LSU

9:45 am – 10:15 am

Break, Exhibits Open, Poster Viewing

AGENDA

10:20 am – 11:15 am

Student and Fellow Presentations

Matthew Bratton

Fracture Status Affecting the Management of Traumatic Cervical Spinal Injury: A National Trauma Data Bank Analysis

Michael Alfred

Initial Antibiotic Care Following Severe Open Gunshot Fractures

Erik Piedy

Are We Missing the Mark? Evaluating Sagittal Deformity in AIS Below Surgical Cutoffs

Anna Lejeune

Perceived Social Support Following Extremity Trauma: Does Sex Matter?

Audrey Ulfers

Impact of Chronic Levothyroxine, Corticosteroid, and Antiepileptic Use on Osteoporosis Prevalence in Adults Aged 50–90 Without Fracture History

William Delahoussaye

Predictors of Digit Replantation and Revascularization Outcomes

Miguel A. De Jesus (Student Research Fellow)

IL-11 as a Novel Target for Arthrofibrosis Therapy

AGENDA

11:15 am – 11:45 am

Keynote Presentation: Robert B. Anderson, M.D.

Hotseat Interview with Carter Clement, M.D.

Managing the Competitive Athlete: Implications in Orthopaedic Care.



Dr. Robert B. Anderson, MD, is the founding orthopaedic surgeon of the O.L. Miller Foot and Ankle Institute at OrthoCarolina in Charlotte, North Carolina, where he practiced for 29 years. In 2017, he joined the Titletown Sports Medicine and Orthopaedic Clinic in Green Bay, Wisconsin, as Director of Foot and Ankle. He returned to Charlotte and OrthoCarolina in March 2023 to focus on the care of elite athletes with foot and ankle conditions.

Dr. Anderson completed his fellowship training in foot and ankle disorders under Dr. John Gould in Milwaukee, Wisconsin, in 1988. He served as the team orthopaedist for the Carolina Panthers from 2000 to 2017 and has been an associate team physician for the Green Bay Packers since 2017. Since 2003, he has chaired the NFL's Foot and Ankle Subcommittee and was appointed Chair of the NFL Musculoskeletal Committee from 2016 to 2024, overseeing all orthopaedic injuries and research in professional football. He continues to serve on this committee.

A nationally recognized leader in sports medicine, Dr. Anderson serves as an active consultant to the NFL, NBA, NHL, MLB, NASCAR, and numerous collegiate athletic programs. In recognition of his contributions, he was named the NFL Physician of the Year in 2016 and received the President's Lifetime Achievement Award from the NFL Physicians Society/Professional Football Athletic Trainers Society in 2024.

Dr. Anderson co-founded the OrthoCarolina Foot and Ankle Fellowship program and served as Chief of the Foot and Ankle Service at Carolinas Medical Center (Atrium Health) from 1989 to 2015. He is a past president of the American Orthopaedic Foot and Ankle Society and currently serves as an associate editor for Foot & Ankle International (FAI). He is also co-editor of the 9th edition of Mann's Surgery of the Foot and Ankle, former Editor-in-Chief of Techniques in Foot and Ankle Surgery, and a longtime reviewer for JBJS, JAAOS, FAI, AJSM, and other peer-reviewed publications. He has authored and edited numerous chapters and scientific manuscripts.

Congratulations on Your Fellowships, Chiefs!

Multicenter Comparison of Outcomes for Management of GSW Humerus Fractures



Adam Haydel MD

Introduction: Gunshot wounds (GSWs) are a major cause of injury and disability in the US. Although humerus fractures unrelated to ballistic injury have been successfully managed both operatively and nonoperatively, the outcomes of GSW-induced humerus fractures remain more uncertain. We aim to compare outcomes, both radiographic and clinical, between operative and nonoperatively treated GSW-induced humerus fractures.

Methods: We conducted a retrospective chart review of patients aged 18 or older who sustained a GSW-induced humerus fracture and presented at one of 9 university hospitals between January 2016 and October 2021. Data, including demographic and clinical details, GSW-related information, and outcomes, were extracted from medical charts. Patients were categorized based on surgical intervention (operative vs nonoperative), and the univariate association with various outcomes was analyzed using either a χ^2 test or a t-test.

Results: A total of 427 patients were included in the preliminary analysis (291 operative vs 146 nonoperative). No significant differences were observed between the 2 groups in age ($P = 0.644$), gender ($P = 0.174$), race ($P = 0.310$), or insurance ($P = 0.403$). The majority of patients were male (88.1%), African American (78.9%), and had Medicaid insurance (61.4%). Median age was 28 years old (range, 18-75). Operative patients had a higher prevalence of nerve (46.7% vs 22.1%, $P < 0.001$) and vascular injury (17.5% vs 4.4%, $P < 0.001$). 61.2% of operative patients and 42.7% of nonoperative patients had at least 1 follow-up 60 days or later after hospital discharge. Overall, operative treatment was associated with a higher infection rate (6.5% vs 0.7%, $P = 0.006$) and observed nonunion rate (10.7% vs 4.4%, $P = 0.033$), while observed union rates did not significantly differ (49.1% vs 44.4%, $P = 0.093$).

Conclusion: Patients who underwent operative treatment were more likely to have preoperative nerve and vascular injury. Operative treatment of GSW-induced humerus fractures was associated with higher rates of infection and nonunion

Minimally Invasive Methods for Adolescent Intraarticular Distal Humerus Fractures with an Intact Column



Austin Broussard MD

Introduction: Intraarticular distal humerus fractures can occur in adolescents and represent a unique morphology that is amenable to different surgical techniques than distal humerus fractures in adults or younger children, especially when one column remains intact. Despite articular involvement, a minimally invasive approach utilizing the intact periosteum and opposing intact column of bone can often achieve successful reduction and fixation. Here, we present operative techniques that we have found helpful for these fractures.

Key Concepts: Intraarticular distal humerus fractures occur in adolescents and often demonstrate a characteristic pattern with a relatively vertical intraarticular fracture line with minimal articular comminution and limited displacement. Excellent reduction and fixation can often be accomplished through minimally invasive or percutaneous techniques, unlike most intraarticular distal humerus fractures in adults. In this paper, we describe straightforward fracture reduction methods, including indirect reduction via guide pins and cannulated screws alone or augmented with a periarticular clamp or ball-spike pusher. Our preferred fixation technique involves lateral-to-medial screws, ideally with one screw just proximal to the articular surface and additional screws as needed proximal to the olecranon fossa.

Conclusion: Intraarticular distal humerus fractures in adolescents behave differently than intraarticular fractures in adults, often displaying less displacement due to intact periosteum. In these fractures, minimally invasive fixation with percutaneous lag screws is a viable option for cases without articular comminution. This technique can provide adequate stability, early transition from immobilization post-operatively and avoidance of open plating techniques. The surgical technique is well-grounded in orthopaedic principles, including using periosteum to facilitate reduction in growing patients and favoring a less-invasive approach when possible

Medicaid Patients Undergoing Total Joint Arthroplasty at Lower Volume Hospitals by Lower Volume Surgeons Associated with Poorer Outcomes



Adam Miller MD

Introduction: Flexible intramedullary nail (FIN) fixation of pediatric femur fractures is a popular method of fixation in children. Typical immobilization options include spica casting, long leg cast, knee immobilizers, or no immobilization and the decision to use each is usually left to surgeon preference. Our primary aim is to evaluate whether different postoperative immobilization status influences outcomes, namely radiographic alignment at the time of healing.

Methods: A retrospective chart review was conducted of all patients with femur fractures treated with FIN fixation at a pediatric hospital from April 2018 through July 2022. Postoperative immobilization protocols were recorded and separated into two groups, patients who were immobilized (IMM) and patients who were not immobilized (NoIMM). Radiographs were evaluated for fracture alignment immediately following surgery and at the time of healing. Patients' demographic, fracture, and postoperative clinical characteristics were compared between the two groups (NoIMM vs. IMM). A total of 41 patients were treated for diaphyseal femur fractures with FINs at our institution during the study period.

Results: A total of 41 patients were treated for diaphyseal femur fractures with FINs at our institution during the study period. Twenty two fractures were classified as length stable (10 transverse, 12 short oblique). Nineteen fractures were classified as length unstable (14 long oblique, 5 comminuted). The IMM group was composed of 5 patients treated with casting (4 single leg spica casts, 1 long leg cast) and 22 with knee immobilizer, while the remaining 14 patients with no immobilization postoperatively constituted the NoIMM group. Notably, one surgeon allowed all patients to weight bear as tolerated without immobilization regardless of fracture stability (10 of the 14 patients in the NoIMM group). Our results suggest that either immobilization or no immobilization after flexible intramedullary nailing of pediatric femoral shaft fractures are viable options for reliable fracture healing

Conclusion: In this study, lack of immobilization did not lead to loss of alignment, nor worse final alignment and had less complications than the immobilization group. Further research in this area would be valuable, particularly examining whether immobilization improves postoperative pain control. This investigation would likely require a well-planned prospective study. A larger study would also be valuable in evaluating immobilization of length stable vs. unstable fractures treated with flexible nails as there is no consensus currently in the literature on the subject and a very large sample size will be needed for adequate power. This investigation would likely require a multicenter study.

Intraoperative Vertebral Artery Injury: Evaluation, Management, and Prevention



Nathan Redlich MD

Introduction: Vertebral artery injury (VAI) is the most common vascular injury during cervical spine surgery and makes up 86.6% of iatrogenic cervical spine vascular injuries. The typical mechanism of VAI in cervical spine surgery is laceration. The most common causes are drilling (anterior approach) and instrumentation (posterior approach). Delayed complications from arterial laceration include recurrent bleeding, pseudoaneurysm development, and arteriovenous fistula (AVF) formation. Neurologic complications from VAI are rare (5%) but can result in potentially devastating ischemia or cerebral infarct due to thrombosis with subsequent emboli. The risk of these complications depends on VA dominance, baseline health of the patient, and management of the injury. Once hemorrhage is controlled patients may frequently be asymptomatic from these injuries, but the possibility of late neurologic sequelae cannot be ignored. The authors would highlight the primary importance of prevention in knowledge of individual patient anatomy, careful selection of procedure choice, and instrumentation techniques to reduce the likelihood of VAI.

Summary: Iatrogenic VAI is a rare but potentially catastrophic complication. Advanced imaging techniques and increased anatomic knowledge are crucial to the prevention of these complications during cervical spine surgeries performed for various cervical spine disorders. Regardless of the surgical approach, surgeons must be aware of the potential for VAI and take the necessary steps for prevention of complications by understanding a patient's vascular anatomy, recognizing anatomic anomalies, undertaking proper surgical planning, and maintaining close monitoring during the perioperative period. Surgeons must be aware of the appropriate management strategies for VAI and be prepared to perform hemostatic tamponade, microvascular repair, or anastomosis as needed. VA dominance and collateral circulation must be known preoperatively before surgical ligation or permanent clipping is attempted. Recent advancements in endovascular treatment have provided increased intervention options in iatrogenic VAI. In the event of VAI, local control of bleeding is the first concern followed by immediate angiography, serial endovascular treatment, and close monitoring of the patient.

Clinical Care Points: Iatrogenic vertebral artery injury (VAI) is a rare but potentially devastating complication of cervical spine surgery. Surgeons should be aware of anatomic variants of the vertebral artery, the presence of which can be detected on meticulous review of preoperative imaging. Prevention is key to avoiding any injury through knowledge of patient anatomy, procedure and instrumentation selection, care in dissection, and meticulous surgical technique. Initial management of VAI includes tamponade and enlistment of anesthesia assistance in addition to neurointerventional radiology/surgery or vascular surgery if available. Treatment modalities remain controversial and include tamponade, direct repair, ligation, or endovascular interventions. Surgeons must be aware of late complications of VAI such as delayed hemorrhage, pseudoaneurysm, and arteriovenous fistula in addition to management options.

Student & Fellow Presentations

Fracture Status Affecting the Management of Traumatic Cervical Spinal Injury: A National Trauma Data Bank Analysis

Introduction: Traumatic cervical spinal cord injuries (SCI) often result in a significantly impaired quality of life for those affected. Early decompression of spinal cord injuries within 24 hours has been associated with improved patient outcomes. Consequently, variations in time to emergency spinal decompression significantly impact patients' complication rate and postoperative recovery. This study aimed to identify differences in time to surgical decompression based on fracture status.

Methods: Patients who experienced a traumatic cervical SCI from 2017-2020 were extracted from The National Trauma Data Bank using ICD-9 and ICD-10 codes. Patients were propensity score matched 1:1 based on preexisting comorbidities. Outcome variables examined included age, fracture status, time to surgical decompression, and hospital complications. Patients with central cord syndrome were excluded.

Results: 13,738 patients met inclusion criteria. Patients who had a cervical SCI and concomitant fracture (CF) were older compared to patients without a fracture (NCF; 62 vs 60 years, $p=0.004$). NCF patients experienced longer times to decompression compared to CF patients (32.3 vs. 25.6 hrs, $p<0.0001$). Additionally, NCF patients experienced early and ultra-early decompression at lower rates when compared to CF patients (Table 1). NCF patients spent more time in the emergency department (3.2 vs 2.2 hours, $p<0.0001$) but less time on the ventilator (5.0 vs 7.0 days, $p<0.0001$), in the hospital (9.0 vs 11.0 days, $p<0.0001$), and in the ICU (5.0 vs 6.0 days, $p<0.0001$) compared to CF patients.

Discussion: Patients who experienced a cervical SCI without a concomitant fracture experienced delayed operative management at higher rates than CF patients. Future work is needed to optimize treatment algorithms and expedite surgical intervention.

Significance/Clinical relevance: Reduction in spinal decompression to under 24 hours is critical in optimizing patient outcomes.



Matthew Bratton (L4)

Initial Antibiotic Care Following Severe Open Gunshot Fractures

Introduction: Gunshot injuries are a common and expensive cause of trauma care for our local population. Among patients who are seen for trauma care in New Orleans, nearly 60% require orthopaedic surgery consultation secondary to gun shot bone and soft tissue injuries. Recommended care for gunshot fractures is mixed with regards to how the resultant wound should be treated; and the surgeon's perceived severity of the open wound likely influences how aggressive wound care including antibiotic coverage is delivered. Published outcomes are variable for bone fractures sustained due to gunshot injury in part because the resultant injury and concomitant injuries are highly variable. The purpose of this study is to describe antibiotic use patterns and complications following gunshot extremity fractures resulting in severe wounds.

Methods: This retrospective cohort study identified patients with severe open lower extremity fractures (Gustilo and Anderson grade 3) using the electronic medical record. Demographics and mechanisms of injury were then abstracted where mechanisms were categorized as blunt versus penetrating trauma. Pre-hospital and emergency department antibiotics were abstracted. Initial antibiotic care for both blunt and penetrating resultant injuries was tested for association with fracture related infections.

Results: Two-hundred and sixty-nine grade 3 open lower extremity fractures were included. Eighteen percent (49/269) were the result of penetrating trauma. Of these, 35% (17/49) did not receive pre-hospital or emergency department antibiotics. For the penetrating trauma patients who did receive pre-hospital or emergency department antibiotics (65%, 32/49), most received gram positive coverage (56%, 18/32) while 28% (9/32) received both gram positive and gram negative coverage. Penetrating trauma related fractures tended to have a lower odds of having pre-hospital or emergency department antibiotics administered (65% versus 74%, 162/220) but when having had antibiotics administered were as likely to have administered both gram positive and gram negative coverage (28% versus 26%, 57/220). Despite this, fracture related infection frequencies were essentially the same between open fractures from penetrating trauma (27%, 13/49) versus blunt mechanisms (25%, 55/220).

Discussion: While initial antibiotic care is controversial in the treatment of gunshot related fractures, this study examined antibiotic care for those fractures specifically with severe wounds. Despite including documentation of a grade 3 open fracture, not all patients had documentation of pre-hospital or emergency department antibiotics. Furthermore, gram positive monotherapy was the most common despite open fracture antibiotic recommendations, a finding which is consistent with recent results published by Lin et al. This tended to be more frequent in patients with penetrating injuries compared to blunt trauma. Regardless of initial antibiotic care or injury mechanism, fracture related infection rates were found to be similar to previous rates for grade 3 open injuries.

Significance/Clinical relevance: "Infection rate similar regardless of initial care or mechanism, however not all grade 3 open fractures are not receiving antibiotics contrary to recommendations."



Michael Alfred (L4)

Are We Missing the Mark? Evaluating Sagittal Deformity in AIS Below Surgical Cutoffs

Introduction: Adolescent idiopathic scoliosis (AIS) is traditionally managed based on the degree of coronal curvature, with surgical intervention typically reserved for Cobb angles $>50^\circ$. However, adult spine literature identifies sagittal malalignment—including SVA, PI-LL mismatch, and T1-pelvic angle—as key predictors of long-term morbidity. This study evaluates the sagittal alignment of nonoperative AIS patients with moderate coronal curves and questions whether coronal-based thresholds may overlook high-risk alignment profiles.

Methods: We conducted a retrospective review of AIS patients treated between 2016 and 2022. Inclusion criteria were reaching skeletal maturity without surgical intervention and major coronal curve between 30° and 50° . Radiographic parameters included traditional sagittal metrics (SVA, PI-LL mismatch, thoracic kyphosis, pelvic tilt, cervical lordosis, T1-pelvic angle), as well as emerging alignment measures: C2 pelvic angle (C2PA), T4 pelvic angle (T4PA), L1 pelvic angle (L1PA), and C2 slope. Thresholds for concerning alignment included: SVA >5 cm, PI-LL mismatch $>10^\circ$, T1-pelvic angle $>14^\circ$, pelvic tilt $>25^\circ$, thoracic kyphosis $<20^\circ$, and cervical lordosis $<20^\circ$.

Results: Sixty-seven patients were included (mean Cobb angle: 38.2°). Among these, 32.84% had a PI-LL mismatch $>10^\circ$, 10.45% had T1-pelvic angle $>14^\circ$, and 4.48% had an SVA >5 cm. Additional findings included thoracic hypokyphosis ($<20^\circ$) in 4.48% and pelvic tilt $>25^\circ$ in 4.48%. Roussouly classification revealed 10.45% type 1, 7.46% type 2, 56.72% type 3, and 25.37% type 4.

Discussion: Despite not meeting traditional surgical criteria, a substantial proportion of nonoperative AIS patients demonstrated sagittal misalignments associated with long-term spinal degeneration in adults. These findings challenge the reliance on coronal Cobb angles alone in determining surgical candidacy and suggest that early intervention may be warranted in select patients based on sagittal profile.

Significance/Clinical relevance: Sagittal malalignment is present in a meaningful subset of nonoperative AIS patients. As spine surgery trends toward precision alignment and long-term quality of life outcomes, incorporating sagittal criteria into surgical decision-making may better identify at-risk patients and optimize long-term spine health.



Erik Piedy (L3)

Perceived Social Support Following Extremity Trauma: Does Sex Matter?

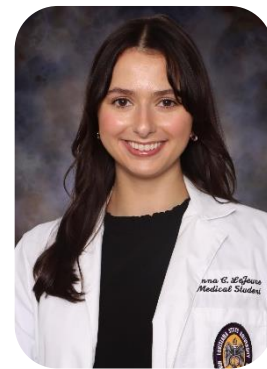
Introduction: Following a traumatic injury, patients in recovery often face challenges performing daily activities and may depend on support from others to manage their regular responsibilities. Existing research in orthopaedic trauma has identified two patient-reported factors that significantly affect fracture recovery outcomes: self-perceived social support and self-efficacy. However, current research frequently lacks detailed information about the study participants' individual characteristics, or studies primarily include male subjects. Therefore, the purpose of this study is to investigate how various demographic characteristics and social roles, particularly sex and caregiving, impact traumatic fracture patients' self-reported perceptions of self-efficacy and social support.

Methods: This prospective cohort study was conducted at the University Medical Center LSUHSC Orthopaedic Trauma Clinic. Adults between the ages of 18 to 79 who had sustained at least one new extremity fracture within six weeks of study enrollment date were eligible to participate. Upon providing informed consent and HIPAA authorization, patients completed a questionnaire consisting of demographic information along with three surveys from the NIH PROMIS Item Bank. These surveys included the General Self-Efficacy instrument and two short forms that assess Emotional Support and Instrumental Support. All three surveys were rated on a 5-point Likert scale. Participant responses were compared by linear regression analysis using T-scores, with respect to normative population values. Differences between sexes were examined, controlling for age, ethnicity, education, and caregiving roles for children and/or adults.

Results: The study has enrolled 52 subjects to date, comprising of 66% male and 33% female. Among these participants, 25% indicated that they were the primary caregiver to a child or adult, and 38% reported a spouse or partner living in the home. When comparing the study population to normative values for each survey, social roles and household composition did not affect patient reported outcomes for female patients. However, male patients reported lower levels of self-efficacy ($p = 0.014$, $\beta = -8.8$ [95%CI -15.7 - -1.9]) and higher levels of instrumental support ($p = 0.049$, $\beta = 6.1$ [95%CI 0.03-12.1]) if there was a partner/spouse in the household. Also, patient reported available emotional support was negatively associated with Hispanic/Latino ethnicity ($p = 0.049$, $\beta = -6.7$ [95%CI -12.7 - -0.6]).

Discussion: While we did not find predictors in patient reported outcomes for female patients, it does appear there are perceived differences in self-efficacy and social support based on social roles between the sexes. Notably, findings also suggest that certain ethnicities may be associated with lower levels of social support. These findings may be due to societal and cultural influences on relationship dynamics.

Significance/Clinical relevance: Understanding the relationship between gender, self-efficacy, and social support can aid healthcare professionals in identifying patients that may be particularly challenged by the difficulties of traumatic fracture recovery and in connecting those patients with the appropriate resources to aid in their recovery.



Anna Lejeune (L3)

Impact of Chronic Levothyroxine, Corticosteroid, and Antiepileptic Use on Osteoporosis Prevalence in Adults Aged 50–90 Without Fracture History

Introduction: Osteoporosis is a prevalent condition in older adults, yet current screening guidelines primarily target individuals with a history of fractures, potentially overlooking those on medications that elevate osteoporosis risk. This study examines the association between chronic use of levothyroxine, corticosteroids, and antiepileptics with osteoporosis prevalence in adults aged 50–90 years without prior fractures. We hypothesized that individuals using these medications would exhibit a higher prevalence of osteoporosis compared to non-users.

Methods: This retrospective cohort study analyzed electronic health record data from 2011 to 2023, including 446,075 patients aged 50–90 years. The exposed cohort consisted of individuals prescribed levothyroxine, corticosteroids, or antiepileptics, while the control cohort included non-users. Osteoporosis was identified using ICD-9 codes (733.01, 733.02, 733.03, 733.09, V82.81, V13.51, V49.81) and ICD-10 codes (Z13.820, Z78.0, Z87.310, M80, M81, M81.0, M81.6, M81.8). Exclusion criteria included prior osteoporotic fractures or conditions predisposing patients to fractures. Osteoporosis prevalence and relative risk (RR) were stratified by sex and age. Statistical analyses included chi-square tests and logistic regression ($\alpha=0.05$).

Results: Following exclusions, 39% of the study population were male and 61% female. Osteoporosis prevalence was significantly higher in the exposed cohort (levothyroxine: 55.42%, corticosteroids: 35.51%, antiepileptics: 35.37%) versus controls (25.92%). The relative risk of osteoporosis was highest among levothyroxine users (RR=2.14, $p<0.001$), followed by corticosteroids (RR=1.37) and antiepileptics (RR=1.36). Women in the exposed group exhibited greater osteoporosis prevalence, with levothyroxine users having the highest odds ratio (OR=3.00 in women vs. OR=2.19 in men). Osteoporosis prevalence increased with age, with the highest rates in older exposed individuals.

Discussion: Findings indicate a strong association between chronic levothyroxine, corticosteroid, and antiepileptic use and osteoporosis, particularly among women. The increased prevalence suggests a need for improved osteoporosis screening and preventive interventions in high-risk populations. Limitations include reliance on diagnostic coding and potential confounders such as medication adherence and comorbidities. Further research is needed to assess causality and the impact of early intervention.

Significance/Clinical relevance: These findings support expanding osteoporosis screening guidelines to include patients on long-term levothyroxine, corticosteroids, and antiepileptics, potentially improving early detection and prevention strategies.



Audrey Ulfers (L3)

Predictors of Digit Replantation and Revascularization Outcomes

Introduction: The purpose of this study was to determine how different factors affect digit replantation and revascularization outcomes. We hypothesized that positive outcomes would be associated with primary arterial/venous repairs, less comorbidities, and shorter ischemia times.

Methods: Patients that received digit replantation or revascularization procedures between 2019-2024 were queried through our institution's electronic medical record system using ICD-10 code. Extracted data included demographics, injury characteristics, peri-operative management, and surgical techniques. Statistical analysis was performed using Fisher's exact tests and Mann-Whitney U tests, with $p < 0.05$ for statistical significance.

Results: Our analysis included 19 replantation patients (21 digits) and 25 revascularizations patients (39 digits), with success rates of 37% and 80%, respectively, and an overall success rate of 61%. Time from injury to presentation for replants had a mean time of 2.7 hours for successful replants and 4.9 hours for failures ($P = .04$). The mean Elixhauser comorbidity index for revascularization patients was 0.4 for successes and 5.0 for failures ($P < .001$), with the most significant comorbidity being cardiac arrhythmia (OR 0.02, $P = .004$). Sharp injuries had a revascularization success rate of 95% while crush/avulsion injuries were 47% ($P = .001$). Replants with one artery repaired by venous autograft and at least one repaired vein had a 78% higher success rate compared to other vessel repair combinations (OR 23, $P = .03$). In non-sharp injuries, increased success rates were associated with primary venous repairs (OR 20, $P = .03$), while primary arterial repairs were negatively associated (OR 0.1, $P = .049$). Revascularization success was 66% higher when concomitant nerve repair was performed (OR 35, $P < .001$). Intraop use of papaverine during vessels anastomosis decreased revascularization success rates by 45% (OR 0.08, $P = .002$). Heparin drip at 500 U/h post-op to discharge increased replant patient success rate by 55% (OR 13, $P = .04$). Patients receiving leech therapy after a salvage procedure had a 46% lower success rate compared to those without (OR 0.14, $P = 0.007$). However, leech therapy had a mean initiation time of 1.0 hours after surgery for success, and 4.3 hours after surgery for failures ($P = .03$). Surgeons with hand fellowship training had a 55% higher digit revascularization success rate compared to plastic surgeons without hand fellowship training (OR 12, $P = .04$).

Discussion: Success rates in digit salvage are influenced by a multitude of factors. Ischemia time, mechanism of injury, and comorbidities seem to be the strongest pre-operative indicators of digit salvage. Potential limitations include small sample sizes and data being limited to chart review. Some treatment options had better success rates with certain injury groups, suggesting injury-specific management may improve outcomes.

Significance/Clinical relevance: This study identifies patient- and treatment-specific factors that significantly impact digit salvage outcomes and supports enhanced clinical decision-making in replantation and revascularization



William Delahoussaye (L4)

IL-11 as a Novel Target for Arthrofibrosis Therapy

Introduction: Arthrofibrosis (AF) is a debilitating complication of joint trauma, surgery, or chronic conditions such as osteoarthritis (OA), often resulting in painful stiffness and restricted mobility. Standard treatments like manipulation under anesthesia (MUA) and arthrolysis are frequently inadequate in severe or refractory cases. Interleukin-11 (IL11), a downstream effector of TGF- β 1, drives myofibroblast differentiation and pathological collagen deposition, as previously demonstrated in idiopathic pulmonary fibrosis (IPF). This study investigates the anti-fibrotic potential of novel small-molecule IL11 inhibitors (NMX compounds) in models of AF.

Methods: Primary fibroblasts were isolated from the knees of 24 patients with histologically graded low or high severity arthrofibrosis secondary to OA. Synovial fluid analyses revealed significantly elevated IL11 and collagen levels, correlating with fibrosis severity. Commercial human fibroblast-like synoviocytes were then treated with TGF- β 1 to induce fibrotic activation in vitro. Cells were subsequently treated with NMX compounds, including NM1155 and NM1207. IL11 expression and fibrosis markers (α SMA, COL1) were quantified and compared across untreated, unstimulated, and treated groups.

Results: NMX treatment significantly suppressed IL11 expression and fibrotic markers in TGF- β 1-stimulated synovial fibroblasts and patient-derived AF myofibroblasts. NM1155 effectively reduced α SMA-positive myofibroblast differentiation, while the next-generation compound NM1207, designed for improved half-life, demonstrated superior efficacy in decreasing COL1 production.

Discussion: IL11 plays a pivotal role in promoting myofibroblast persistence and collagen accumulation in AF, paralleling mechanisms observed in IPF. The ability of NMX compounds to blunt this fibrotic response highlights IL11 as a key therapeutic target. Correlations between IL11 levels, collagen burden, and disease severity further support its use as both a biomarker and intervention point in AF management.

Significance/Clinical relevance: These findings support IL11 inhibition as a promising, non-invasive therapeutic strategy for arthrofibrosis. NMX compounds may offer a disease-modifying alternative to surgery, potentially improving joint function and patient outcomes. Future in vivo studies will determine their translational applicability and long-term efficacy in AF.



Miguel A. De Jesus
Research Fellow

Poster Presentations

1. Knee-Deep in Search – Growing Patient Interest in Meniscus Surgery During The Last 15 Years – **Irfan Khan**
2. Hemiarthroplasty for a Femoral Neck Fracture in a Patient with BMI 85 – **Zachary Ashworth**
3. Ethnic Disparities in Psychological Distress and TKA Recovery Outcomes – **James Aulds**
4. Minimum Bromelain Treatment Time for Effective Biofilm Dissolution – **Hallie Berndt**
5. Tracking Muscle Damage and Recovery: Biomarker Analysis in Collegiate Football Athletes – **Grace Brandhurst**
6. Cost Analysis of Devascularized Digit Injury Management – **Christopher Branstetter**
7. The Impact of Increasing Dietary Protein Intake on the Gut Microbiome – **Lauri Byerley**
8. Evaluating the OsteoProbe® as a Tool for Assessing Trabecular Bone Quality and Postoperative Pain Prediction in Total Knee Arthroplasty – **Jacob Chaisson**
9. Early Definitive Fusion vs. Magnetic Growing Rods in “Tweeners”: What do Parents Prefer? – **Sylvia Culpepper**
10. Shouldering The Surge – Increasing Patient Interest in Rotator Cuff Surgery During The Last 15 Years – **Irfan Khan**
11. A Rare Case of Pediatric Secondary Chondrosarcoma: Leg-Sparing Hemipelvectomy with Pelvic Reconstruction – **Sarah Garner**
12. Use of a Novel IL11 Blocking Agent to Modulate Hypertrophic Dermal Scarring – **Mary Gatterer**
13. Evaluating Bromelain’s Effects on In Vitro Cytotoxicity – **Ty Gregory & Richard Hawkrider**
14. Targeted Relief: Peripheral Nerve Stimulation for Knee Pain in the Era of Opioid Reduction and Surgical Alternatives – **Rafael Guzman-Arevalo**
15. From Sidelines to Center Stage – Increasing Public Interest in Anterior Cruciate Ligament Reconstruction – **Irfan Khan**
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