



**UNIVERSITY OF SASKATCHEWAN
UNIVERSITY OF MANITOBA**

**COMBINED ORTHOPEDIC
RESIDENT RESEARCH DAY**

May 29, 2026

**Vivian K. Asher Auditorium (G763)
Royal University Hospital**



Guest Speaker Neil White, MD, FRCS(C)

Clinical Associate Professor

Orthopedic Surgery, Cumming School of Medicine, University of Calgary

Associate Member

McCaig Institute for Bone and Joint Health

Dr. Neil J. White is an Associate Professor in the Department of Surgery (Division of Orthopaedics) at the University of Calgary's Cumming School of Medicine, and a hand, microvascular, and orthopaedic trauma surgeon at South Health Campus, where he serves as Orthopaedic Surgery Site Lead.

He completed medical school at the University of British Columbia, his orthopaedic surgery residency at the University of Calgary, a hand and microvascular surgery fellowship at Columbia University, and an orthopaedic trauma fellowship at the Royal Infirmary of Edinburgh.

His clinical and research interests centre on wrist and elbow injuries - including distal radius, scaphoid non-union, perilunate dislocations, and distal biceps repair. Dr. White founded and co-chairs The Wrist and Elbow Research Society of Canada (WECAN) and runs a local research group in Calgary – SCRUBS (South Campus Research Unit for Bone and Soft-tissue).



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Tess Bracken, PGY2
Soroush Nedaie, PGY2
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Benedict Wightman, PGY1**

**Kyle Goldstein, PGY4
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Zach Oleynik, PGY4
Omer Alkhateeb, PGY3
Nordan Flaaten, PGY3
Colleen Nesbitt, PGY3
Mars Zhao, PGY3
Abdulwahab Aladsani, PGY2
Robert Downey, PGY2
Gavin King, PGY2
Evan Parchomchuk, PGY1
Ethan Patterson, PGY1
Shervin Frootan, PGY1**

BE WHAT THE WORLD NEEDS

2026 Resident Research Day Program

8:30 Breakfast

8:45 Opening remarks - Dr. Kulyk

SESSION I

Dr. Urmson - Moderator

9:00	Ankle Fracture FROST: A Retrospective Case Study	Ethan Patterson
9:10	Canadian Surgeons' Views on Outpatient ACDF Procedures: What's the Hold Up?	Nordan Flaaten
9:20	Occult Pelvic Fractures Following Primary Total Hip Arthroplasty: A Retrospective CT-Based Cohort Study	Gavin King
9:30	Evaluating the Efficacy of an Orthopedic Trauma Operating Room: A Retrospective Study and Survey of Patient and Surgeon Satisfaction	Kyle Goldstein
9:40	Identifying Preoperative Risk Factors to Guide Postoperative Blood Tests in Lower Limb Total Joint Arthroplasty Patients	Robert Downey
9:50	Assessing Whether Intraoperative Histological Samples are Necessary in Aseptic Total Hip and Knee Arthroplasty Revisions	Evan Parchomchuk
10:00	Break	

SESSION II

Dr. Laura Sims, Moderator

10:10	PWHL Injury Surveillance: Epidemiology of Injury Patterns Across the First Three PWHL Seasons – A Proposal	Tess Bracken
10:20	The Effects of Looped Suture Patterns on Biomechanical Properties of Tendon and Ligament Repair and Reconstruction: An In Vitro Porcine Model Biomechanical Study	Andrew Fast
10:30	Evaluating Pitching Mechanics to Identify Association with Upper Extremity Injury in Amateur Baseball Players – A Kinematic Analysis	Luca Ramelli
10:40	GLP-1 Receptor Agonists in Shoulder Arthroplasty: A Systematic Review and Meta-Analysis of Postoperative Outcomes	Darren Van Essen
10:50	Incidence of Total Hip Arthroplasty After Pediatric Septic Arthritis of the Hip in a Canadian Province	Evan Abram
11:00	Income and Geographic Disparities in Operative Management of Proximal Humerus Fractures Persist in a Universal Healthcare System: A Population-Based Cohort Study	Madison Price

GUEST LECTURE I

Dr. Neil White

- 11:10 Complex Distal Radius – Tips and Tricks
- 11:50 Group Photo
- 12:00 Lunch at the University Club

SESSION III

Dr. Anthony King, Moderator

- 13:30 Effect of Creatine Supplementation on Functional Recovery and Lean Body Mass After Primary Total Hip Arthroplasty (THA): A Randomized, Double-blind, Placebo-controlled Trial Abdulwahab Aladsani
- 13:25 Cement Augmentation of Pedicle Screw Fixation for Metastatic Spine Disease: A Systematic Review of Clinical Outcomes and Complications Josh Garofalo
- 13:35 Early Versus Delayed Fixation of Tibial Plateau Fractures: A Systematic Review and Meta-Analysis Soroush Nedaie
- 13:45 PROMS Stand up: No difference in Pre- or Post op Patient Reported Outcomes in Patients with Single or Bilateral Knee Osteoarthritis Colleen Nesbitt
- 14:00 Comparing the Accuracy of Pre-Operative Templating Techniques for Total Hip and Knee Arthroplasty Luca Ramelli
- 14:10 Biomechanical Impact of Splint Rods in Posterior Cervicothoracic Fixation: A Finite Element Analysis Jaskaran Singh
- 14:20 Break

SESSION IV

Dr. David Sauder, Moderator

- 14:30 Impact of Patellar Thickness Restoration and Patellar Resurfacing Angle on Patient-Reported Outcomes Following Total Knee Arthroplasty Ben Verrall
- 14:40 Associations Between Pre-Medical Participation in Competitive Fields, Athletic Ability and Surgical Skill Acquisition Andrew Fast
- 14:50 Tibial Tubercle Avulsion Fracture with Patellar Tendon Rupture in Adolescents: A Scoping Review and Case Study Darren Van Essen
- 15:00 Annual Consult Volume of an Orthopaedic Trauma Service at a Major Canadian Centre Benedict Wightman
- 15:10 AI-Assisted vs. Conventional Literature Search in Orthopaedics: A Comparative Analysis of Evidence Quality, Consistency, and Clinical Interpretability Gavin King

GUEST LECTURE II
Dr. Neil White

- 15:20 Advances in the Interosseous Ligament and Its role in Elbow Trauma
- 16:00 Judges Deliberation
Dr. N. White, Dr. P. Kulyk, Dr. D. Ogborn
- 17:00 Dinner & Awards Presentation

**University of Saskatchewan
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**Combined Resident
Research Day**

ABSTRACTS



Ankle Fracture FROST: A Retrospective Case Study

Ethan Patterson (PGY1), Chloe Elliott, Martina Vergouwen, Sarah Patterson, Zoe Mack, Basma Elsinbawi, Eric C. Sayre, Neil J. White

Background:

The effect of weather conditions and seasonal factors on orthopaedic trauma volumes has been identified in recent literature. Understanding these factors allows for improved allocation of surgical resources. This study examines how weather and time of year affects surgical ankle fracture types and volume.

Methods:

A retrospective chart review was conducted on patients with surgical ankle fractures in Calgary, Alberta, from 2008 to 2018. Surgical ankle fractures were classified by Danis-Weber classification, Maisonneuve fractures, presence of medial and posterior malleolus fractures, and presence of bilateral ankle fractures. The classified ankle fracture data was merged with an ice and weather model to complete descriptive statistics and multivariable dispersion-corrected Poisson regression model.

Results:

A total of 8,563 surgical ankle fractures were identified. Forty-nine percent were females (n=4195). The mean age was 45.5 years (SD=16.9). The months January, February and March demonstrate an increased risk of ankle fractures by almost two-fold, when compared to the reference month of October. Ice and snow on the ground in the last three days increased the risk for ankle fracture. The results of this study are multiplicative. For a given day in January, with snow and ice on the ground for three consecutive days, there is an increased risk for ankle injury of almost four-fold (CR=3.85). The classification of ankle fractures and the increased risk with weather factors showed minimal significance in the specificity of ankle fracture type. An increase in the incidence of all ankle fractures corresponds with an increase in all ankle fracture subtypes.

Conclusion:

The month and presence of snow and ice on the ground significantly impacted the volume of ankle fractures. This understanding is important for the targeted allocation of surgical resources to decrease the burden on orthopaedic surgery units during periods of high trauma volume.



Canadian Surgeons' Views on Outpatient ACDF Procedures: What's the Hold Up?

Nordan Flaaten (PGY3), Daryl Fourney, Michael Spiess

Background:

Anterior cervical discectomy and fusion (ACDF) is a standard treatment for cervical radiculopathy, myelopathy, and deformity. Although outpatient ACDF has been shown internationally to be safe in carefully selected patients, its adoption in Canada remains limited. This study evaluated Canadian spine surgeons' perspectives regarding the safety, feasibility, barriers, and patient selection criteria for outpatient ACDF.

Methods:

A cross-sectional survey was distributed to members of the Canadian Spine Outcomes and Research Network (CSORN). Eligible participants were orthopedic and neurosurgical spine surgeons actively performing ACDF. The survey collected data on demographics, practice patterns, safety concerns, institutional barriers, and outpatient selection criteria. Responses were analyzed descriptively.

Results:

Of 106 invited surgeons, 45 responded (43%), with 41 eligible for analysis. Most respondents were orthopedic surgeons (62%) and had more than 10 years of experience. Only 22% currently perform outpatient ACDF; however, 73% believe it is safe with appropriate patient selection and perioperative protocols. The most frequently cited barriers were institutional concerns regarding postoperative hematoma and airway compromise, limited postoperative nursing expertise, and medicolegal risk. Motivating factors included hospital bed capacity constraints and patient convenience. Common exclusion criteria were revision surgery, significant respiratory disease, and continued aspirin therapy. Age and body mass index were generally not considered contraindications. Variability was observed in intraoperative monitoring, hemostatic practices, and discharge protocols.

Conclusion:

Canadian spine surgeons generally view outpatient ACDF as safe and feasible in selected patients. Institutional limitations and risk-related concerns remain key barriers. Development of standardized national guidelines may facilitate broader implementation and greater consistency in practice.



Occult Pelvic Fractures Following Primary Total Hip Arthroplasty: A Retrospective CT-Based Cohort Study

Gavin King (PGY2), Haron Obaid, Michaela Nickol, Johannes M. van der Merwe

Background:

Postoperative pelvic fractures are a rare but under-recognized complication of total hip arthroplasty (THA), particularly with cementless press-fit acetabular components. These injuries may be missed on routine imaging. This study evaluated the incidence, radiographic detectability, risk factors, and early clinical impact of occult pelvic fractures after primary THA.

Methods:

In this retrospective cohort, 60 primary THAs (59 patients) performed by a single surgeon at a tertiary center (June 2024–September 2025) were reviewed. All procedures used a posterolateral approach with a hemispherical uncemented acetabular component and routine screw augmentation. Immediate postoperative radiographs and pelvic CT scans were obtained and independently reviewed by two radiologists to identify fractures and assess interobserver agreement. Demographics, comorbidities, and operative variables were collected. Early outcomes at 6 weeks included VAS pain, Oxford Hip Score, EQ-5D, and use of assistive devices or opioids. Multivariable logistic regression assessed associations between fractures, risk factors, and outcomes.

Results:

Occult pelvic fractures were identified on CT in 22 of 61 hips (36.1%), while radiographs detected only 10%. Fractures most commonly involved the ilium, followed by the posterior column and pubic rami. Radiographic interobserver agreement was 90%. No patient, operative, or early postoperative variables were independently associated with fracture occurrence. At 6 weeks, there were no significant differences in pain, functional outcomes, quality of life, or use of assistive devices or opioids between groups.

Conclusions:

Occult pelvic fractures are common after primary THA but do not adversely affect early clinical outcomes. Standard radiographs substantially under-detect these injuries, and no independent predictors were identified.



Evaluating the Efficacy of an Orthopedic Trauma Operating Room: A Retrospective Study and Survey of Patient and Surgeon Satisfaction

Kyle Goldstein (PGY4), Trey Fritz, Jordan Buchko, Elliott Pally, Scott Willms

Background:

Orthopedic trauma systems require extensive planning to ensure all patients are treated in an appropriate timeframe. There are various ways in which a centre can function to facilitate this. A common system involves a designated orthopedic trauma operating room, which may run on certain days of the week, to prioritize musculoskeletally injured patients. This should, theoretically, accelerate the time to surgery and help optimize patient care in an orthopedic environment. However, there is little research on the efficacy of an orthopedic trauma room.

The two major centres in Saskatchewan – Saskatoon and Regina – have different orthopedic trauma systems. In Saskatoon, there is an orthopedic trauma operating room that runs every day of the year. In Regina, no such room exists and surgeons must therefore sacrifice elective time to accommodate trauma or compete for operative time with other specialties.

Methods:

This proposed study will examine the effects of the orthopedic trauma room in Saskatoon in direct comparison to the system in Regina for three of the most common orthopedic injuries – hip fractures, distal radius fractures, and ankle fractures. We will examine quantitative data as well as qualitative responses from both patients and surgeons.

Results:

Outcome measures will include the wait time for surgery for a given injury as well as the time of day the operation began. There will be surveys administered to surgeons and patients to assess their satisfaction in their system. Surgeons will be asked questions such as how effective they believe their system is and how often they operate overnight. Patients will be asked their general contentment with their experience, especially regarding their surgical wait time and if they feel it was appropriate.

Conclusion:

We hypothesize that the orthopedic trauma room will improve wait times, decrease overnight operations, improve surgeon satisfaction, and improve patient satisfaction. Data will be used to optimize orthopedic care throughout Saskatchewan.



Identifying Preoperative Risk Factors to Guide Postoperative Blood Tests in Lower Limb Total Joint Arthroplasty Patients

Robert Downey (PGY2), Abdu Etagiuri, Daniel Chaudry, Elliot Grande-Sherbert, Benjamin Verrall, Jano van der Merwe, Mikayla Rudniski, Mason Beaulieu, Jans van der Merwe

Background:

It is common practice for lower limb total joint replacement patients to receive routine postoperative blood tests. However, with significant improvements in perioperative care and a growing trend towards day surgery, much of this blood work is often non-actionable or clinically irrelevant. Recent research suggests that routine postoperative blood testing is unnecessary for the majority of these patients.

Methods:

This was a retrospective chart review. A total of 382 total knee arthroplasties (TKAs) and 206 total hip arthroplasties (THAs) were included. Values collected included potassium, sodium, creatinine, estimated glomerular filtration rate (eGFR), hemoglobin (Hb), white blood cell count (WBC), and platelet count. Demographic and perioperative variables included age, sex, body mass index (BMI), medical comorbidities, medications, operative time, American Society of Anesthesiologists (ASA) score, perioperative tranexamic acid use, and Charlson Comorbidity Index (CCI).

Results:

When comparing patients with normal and abnormal preoperative blood work to determine whether they required postoperative intervention, only potassium ($p = 0.049$; OR 0.292) and sodium ($p = 0.007$; OR 0.189) were statistically significant; all other measures were not significant. Bootstrapping analysis identified hypertension, operative time, age, BMI, CCI, postoperative creatinine, use of blood thinners, and postoperative platelet count as stable variables (frequency over bootstraps > 0.70). Multiple regression analysis showed that only two variables were statistically significant predictors of postoperative interventions: use of blood thinners ($p = 0.04$) and BMI ($p = 0.03$). When combining multiple variables to predict postoperative interventions the best performing model was age + BMI + CCI, which achieved an AUC of 0.741.

Conclusions:

Abnormal preoperative potassium and sodium levels were associated with an increased likelihood of postoperative interventions. Patients taking blood thinners and those with higher BMI were more likely to require postoperative interventions. Our best performing risk stratification model achieved fair accuracy in predicting postoperative interventions.



Assessing Whether Intraoperative Histological Samples are Necessary in Aseptic Total Hip and Knee Arthroplasty Revisions

Evan Parchomchuk (PGY1), Mason Beaulieu, Mars Zhao, Mikayla Rudniski, Jenna England, Nathan Oster, Jans Van der Merwe

Background:

Revision arthroplasty imposes a significant economic burden on healthcare systems. While intraoperative sampling is routine, its necessity in clinically presumed non-infectious cases remains debated. This study aimed to identify predictors of unexpected positive cultures and evaluate the utility of routine sampling in aseptic revisions.

Methods:

A retrospective analysis was conducted at a single tertiary center involving 194 patients (44 septic, 150 aseptic revisions). We analyzed preoperative factors and their ability to predict positive intraoperative cultures and subsequent clinical interventions.

Results:

Total knee arthroplasty (TKA) demonstrated higher rates of unexpected positive cultures compared to total hip arthroplasty (THA). Significant predictors of positive cultures included elevated BMI, C-reactive protein (CRP), synovial white blood cell (WBC) count, and synovial polymorphonuclear (PMN) percentage. Additionally, patients with prolonged wound drainage were likely to have multiple comorbidities. Most importantly, 10% of patients preoperatively diagnosed as aseptic yielded positive intraoperative cultures, representing a significant rate of occult infection.

Conclusion:

A "presumed aseptic" diagnosis is not infallible. With a 10% occult infection rate, routine sampling remains a critical safety net to prevent under-treating prosthetic joint infections. Clinicians should maintain a higher index of suspicion in TKA patients and those with elevated inflammatory markers or BMI to ensure appropriate postoperative management.



PWHL Injury Surveillance: Epidemiology of Injury Patterns Across the First Three PWHL Seasons – A Proposal

Tess Bracken (PGY2), Jeff Leiter MSc PhD, Peter MacDonald MD FRCSC, Robert Longstaffe MD FRCSC

Background:

The Professional Women's Hockey League (PWHL) was established in 2023 and has grown rapidly to eight teams with viewership spanning more than 100 countries. A defining feature distinguishing the PWHL from all prior professional women's hockey leagues in North America is its implementation of body checking — a rule with implications for athlete injury risk.

Existing injury surveillance literature in women's hockey is largely anchored in the NCAA system, while professional women's hockey data is sparse. A prospective cohort study from the Swedish Women's Hockey League following its 2022 body-checking rule implementation reported an acute injury incidence of 2.1 per player-season and mean weekly health problem prevalence of 21%, with a notable shift toward contact-related traumatic injuries - findings that carry direct relevance for the PWHL context.

No formal injury surveillance data currently exists for the PWHL — a critical gap that limits evidence-informed athlete safety and injury prevention initiatives.

Methods:

This retrospective cohort study will analyze injury data from the PWHL's athlete monitoring system across all regular season, playoff, and practice exposures over three consecutive seasons (2023–2026). Injury is defined as any time-loss event resulting in absence from one or more games. Variables include injury type, anatomical region, incidence, mechanism, and contextual factors such as game versus practice and body-checking involvement. Athlete anonymity will be maintained throughout.

Results:

Descriptive statistics will characterize the type, anatomical distribution, and incidence of injuries across the three-season study period. Injury rates will be reported per 1,000 athlete-game exposures and stratified by season, game context, setting, and injury type.

Conclusions:

This study establishes the first league-wide injury surveillance baseline for the PWHL. Findings will inform athlete safety initiatives, injury prevention programs, and evidence-based policy development, serving as the foundation of a planned multi-investigation research series conducted in partnership with the PWHL.



The Effects of Looped Suture Patterns on Biomechanical Properties of Tendon and Ligament Repair and Reconstruction: An In Vitro Porcine Model Biomechanical Study

Andrew Fast (PGY4), Darren Hart, Dan Ogborn, Darren Van Essen (PGY3), Rob Longstaffe (Supervisor)

Background:

Stable soft-tissue fixation is critical for tendon and ligament reconstruction/repair to permit early rehabilitation. The Krackow stitch is biomechanically robust but time-intensive; prefabricated looped sutures are efficient but weaker. Novel patterns including the multiplanar perpendicular whipstitch (MPWS) and locking speed whip (LSW) aim to bridge this gap. This study compared five techniques—MPWS, FiberTag (FT), LSW, and two novel patterns: the knotted locking speed whip (KLSW) and multidirectional alternating whip stitch (MAWS)—for time, cost, and biomechanical performance.

Methods:

Porcine flexor tendons were harvested and randomly assigned to five groups (n=8–10/group) prepared with No. 2 FiberWire or FiberTag suture. Constructs were mounted on a materials testing machine and subjected to pretensioning (5–50N, 3 cycles), static loading (5N), cyclic loading (50–100N, 200 cycles), and load-to-failure at 60mm/min. Outcomes included elongation, peak-load displacement, peak load, stiffness, preparation time, and cost. One-way or Welch's ANOVA with Tukey or Games-Howell post hoc comparisons assessed differences ($p < 0.05$).

Results:

KLSW demonstrated the lowest cyclic elongation (2.40 ± 0.49 mm), significantly less than all other sutures ($p < 0.05$), with stiffness comparable to FT. MPWS had the lowest stiffness (62 ± 10 N/mm) and peak load (270 ± 66 N), failing predominantly by suture pull-through, whereas other constructs failed by suture rupture at approximately 330N. KLSW required the longest preparation time (6.63min) and highest cost (\$499 CAD); MAWS was fastest and cheapest but biomechanically inferior. Peak load and pretension elongation did not significantly differ between groups.

Conclusions:

Locking suture patterns, particularly the novel KLSW, provide superior biomechanical performance for tendon and ligament fixation at the expense of operative efficiency. The LSW offers a favorable balance of strength and speed. These findings inform surgical decision-making in soft-tissue reconstruction, with potential to improve construct stability, enable earlier rehabilitation, and enhance patient outcomes. Further investigation into parallel locking stitch techniques is warranted based on these results.



Evaluating Pitching Mechanics to Identify Association with Upper Extremity Injury in Amateur Baseball Players – A Kinematic Analysis”

Luca Ramelli (PGY1), James Dubberley, Jonathan Marsh, Yiyang Zhang, Dan Ogborn, Jeff Leiter, Peter MacDonald

Background:

Overhead baseball pitching is a biomechanically demanding athletic motion. Despite extensive biomechanical characterization, the relationship between specific pitching mechanics and the development of shoulder or elbow pathology remains poorly defined. The purpose of this study is to perform a kinematic analysis of amateur pitchers’ mechanics and compare healthy pitchers to those with known shoulder/elbow pathology to identify differences that could be associated with the development of pathology in amateur pitchers.

Methods:

This is a case-control study that will compare the kinematics of healthy baseball pitchers and pitchers with a history of shoulder/elbow pathology. Each player will be equipped with wearable inertial sensors and will perform a standardized pitching task. The following measurements will be recorded for each player: maximum shoulder external rotation, shoulder internal rotation velocity, shoulder abduction at max external rotation, shoulder horizontal adduction/abduction, elbow extension velocity, elbow flexion at ball release, maximum valgus elbow stress, arm slot/angle, knee flexion at front foot contact, trunk rotation timing, and ground force reaction.

Results and Statistical Analysis:

To compare participant characteristics, a student’s t-test will be used. The Mann–Whitney U test will be used to inspect differences in upper-limb and trunk kinematics between healthy and injured pitchers. Z-scores will be used to compare each kinematic variable in a radar plot. For the statistical analysis, the mean value for the Z-score will be established based solely on the average measurements from the healthy group, allowing for a standardized comparison with injured players.

Relevance of Study:

Throwing-related shoulder and elbow injuries represent a major source of morbidity in amateur baseball pitchers. This study aims to identify if any kinematic measurements are shown to be statistically significant between the healthy and injured groups, with the goal of identifying trends in pitching mechanics that could predispose amateur pitchers to developing shoulder/elbow pathology.



GLP-1 Receptor Agonists in Shoulder Arthroplasty: A Systematic Review and Meta-Analysis of Postoperative Outcomes

Darren Van Essen (PGY3), Soroush Nedaie, Benjamin Wajda, Golpira Elmi Assadzadeh

Background:

Glucagon-like peptide-1 receptor agonists (GLP-1RAs) are increasingly common medications prescribed to orthopaedic patients for metabolic optimization. Perioperative GLP-1RA use in total hip or knee arthroplasty patients has been associated with decreased infection, revision, and readmission rates, but increased risk of periprosthetic fracture. In total shoulder arthroplasty (TSA), however, their safety and impact on arthroplasty-specific outcomes remain incompletely defined. This study investigates whether the perioperative use of GLP-1RAs in patients undergoing TSA is associated with differences in rates of medical and surgical complications.

Methods:

A PRISMA-P compliant systematic review identified retrospective cohort studies of adults undergoing primary TSA with perioperative GLP-1RA use. PubMed, MEDLINE, and EMBASE were searched through January 28, 2026. Outcomes were assessed at 90 days and 2 years. Fixed and random-effects meta-analyses were performed to calculate pooled odds ratios (ORs) with 95% confidence intervals (CIs).

Results:

Of 191 studies screened, 6 met inclusion criteria, comprising 44,263 patients. The mean age was 67.8 years, with 44.0% female. GLP-1RA use was associated with decreased wound complications (OR 0.47, 95% CI 0.26-0.83), sepsis (OR 0.65, 0.49-0.87), but increased deep vein thrombosis (DVT) rates (OR 1.39, 1.11-1.73) at 90 days. There were no differences in readmission, emergency department utilization, transfusion, infection, pneumonia, pulmonary embolism, urinary tract infection, acute kidney injury, cardiac events, stroke, dislocations, or stiffness at 90 days. At 2 years, there were no differences in all-cause revision, prosthetic joint infection (PJI), aseptic revision, or periprosthetic fracture rates.

Conclusion:

Perioperative GLP-1RA use in TSA patients is associated with early decreased wound complications and sepsis, but increased DVT rates. The reported increased risk of periprosthetic fracture seen in hip or knee patients was not seen in this study on TSA. Further prospective research is needed to determine the optimal timing, duration, and patient selection for GLP-1RAs in the arthroplasty patient population.



Incidence of Total Hip Arthroplasty After Pediatric Septic Arthritis of the Hip in a Canadian Province

Evan Abram (PGY1), William Zhang, Jaskaran Singh, Rohit Bansal, James McCammon, Ian Laxdal

Background:

Pediatric septic arthritis of the hip is a serious condition associated with significant short- and long-term morbidity, including joint destruction and functional impairment. Despite advances in early diagnosis and management, some patients develop premature hip osteoarthritis requiring total hip arthroplasty (THA) in adulthood. While prior studies have examined outcomes following pediatric septic arthritis and complications of THA in this population, the long-term risk of THA after childhood septic hip infection remains poorly defined.

Objectives:

This study aims to determine the incidence of THA among patients with a history of pediatric septic arthritis of the hip, with particular focus on the impact of timing of surgical intervention. Secondary objectives include evaluating the age at THA, the effect of recurrent infections, and demographic and socioeconomic factors associated with outcomes.

Methods:

We will conduct a retrospective population-based cohort study using administrative health data from the Manitoba Centre for Health Policy. Patients diagnosed with septic arthritis of the hip before age 18 between 1984 and 2025 will be included. Patients will be stratified into early treatment (≤ 1 day to surgical intervention) and delayed/no early treatment groups. The primary outcome is the incidence of THA, with secondary outcomes including age at THA, recurrence of infection, and associated demographic variables. Statistical analyses will compare outcomes between groups using appropriate tests with significance set at $p < 0.05$.

Expected Results:

We hypothesize that patients with a history of pediatric septic hip arthritis will have an increased incidence of THA compared to the general population, with higher risk observed in those with delayed treatment and recurrent infections.

Conclusions:

This study will clarify the long-term burden of pediatric septic arthritis of the hip and identify factors associated with progression to THA. Findings may inform early management strategies and long-term monitoring to improve patient outcomes.



Income and Geographic Disparities in Operative Management of Proximal Humerus Fractures Persist in a Universal Healthcare System: A Population-Based Cohort Study

Madison Price (PGY-5), Tudor Victor Tufescu, William D. Leslie, Gabriel Larose

Background:

Proximal humerus fractures (PHFs) are common fragility fractures in older adults with no clear management consensus. Socioeconomic status and geography influence treatment selection in multi-payer systems, but their impact within a universal, single-payer system is poorly characterized. This study evaluated whether neighbourhood-level income quintile and area of residence were associated with operative management and hospital resource utilization after PHF in a Canadian province with universal healthcare.

Methods:

Using Manitoba Centre for Health Policy Data Repository (2004–2022), adults ≥ 50 years with a PHF were identified by ICD coding, excluding high-energy trauma. Initial management was categorized as nonoperative, ORIF, hemiarthroplasty (HA), or reverse total shoulder arthroplasty (RTSA). Multivariable logistic regression modelled operative treatment, adjusting for income quintile, area of residence, sex, and age. Secondary outcomes included admission rate, length of stay (LOS), and discharge to long-term care (LTC).

Results:

Among 12,979 patients (mean age 71.5 years; 76.8% female), initial management was nonoperative in 89.9%, ORIF 7.3%, HA 0.9%, and RTSA 1.9%. RTSA use rose from 0.1% (2007) to 4.7% (2021) as HA declined. Treatment differed by income ($p < 0.001$) and residence ($p = 0.01$). On adjusted analysis, highest-income patients had greater surgical odds (OR 1.27, 95% CI 1.07–1.51; $p = 0.007$), while rural (OR 0.83) and community-centre (OR 0.66) residents had lower odds versus the academic centre (both $p \leq 0.005$). Female sex (OR 0.87; $p = 0.03$) and increasing age (OR 0.97/year; $p < 0.001$) further reduced surgical odds. Among admitted patients, mean LOS was longer for nonoperative care (30.5 days) than ORIF (11.6), HA (16.4), or RTSA (10.8). Nonoperative management preceded 98.2% of LTC transfers.

Conclusions:

Income- and geography-related disparities in PHF operative management persist within a universal healthcare system, indicating financial access alone does not eliminate treatment variation. Disproportionate hospital and LTC utilization among non-operative patients identifies a high-impact target for standardized discharge pathways and geriatric co-management.



Impact of Patellar Thickness Restoration and Patellar Resurfacing Angle on Patient-Reported Outcomes Following Total Knee Arthroplasty

Mars Zhao (PGY-3), Mikayla Rudniski, Nathan Oster, Ben Verrall, (Med 3), Haron Obaid, Johannes van der Merwe

Background:

Optimal patellar management in total knee arthroplasty (TKA) remains a subject of debate. Restoring native patellar thickness is biomechanically important for patellofemoral tracking, quadriceps tension, and contact pressure distribution. Overstuffing or under-resection may contribute to anterior knee pain, stiffness, and reduced patient satisfaction. Imaging studies have identified that angled patellar resurfacing on skyline views may affect patellar tracking and load distribution, but clinical evidence linking patellar thickness restoration and resurfacing alignment to patient-reported outcome measures (PROMs) is limited.

Method:

A retrospective chart review was performed on 137 patients who underwent primary TKA in Saskatoon. Skyline radiographs were used to measure pre- and post-operative patellar thickness, displacement, tilt, and resection angle. Patellar thickness was assessed using two different measuring techniques. Patients completed PROMs including the Oxford Knee Score (OKS), Knee Injury and Osteoarthritis Outcome Score for Joint Replacement (KOOS-JR), and Kujala score.

Results:

PROMs did not differ significantly based on restoration of patellar thickness within 2 mm of preoperative values or by postoperative patellar displacement. However, patients with changes in patellar tilt greater than 5° demonstrated significantly worse Kujala ($p=0.025$) and KOOS-JR ($p=0.032$) scores.

Conclusion:

Patellar thickness restoration and displacement were not associated with changes in PROMs. Greater changes in patellar tilt were associated with worse functional outcomes, though interpretation is limited by the sample size. Overall, restoration of native patellar thickness and correction of patellar alignment parameters were not associated with clinically meaningful differences in early postoperative PROMs following TKA.



Cement Augmentation of Pedicle Screw Fixation for Metastatic Spine Disease: A Systematic Review of Clinical Outcomes and Complications

Garofalo, Josh (PGY2), Nedaie, S., Singh, J., Sahi, G., Eren, A., Jacobs, B., Larouche, J., Ahn, H., Ivandic, S., Corluka, S., Abbas, A., T

Background:

The spinal column is a frequent site of bony metastasis and pathologic vertebral fractures, resulting in significant morbidity due to pain, instability, and potential spinal cord compression. Pedicle screw cement augmentation has been increasingly used to enhance construct stability in osteoporotic and tumor-affected bone. This study aimed to systematically review and summarize existing literature on the efficacy and safety of pedicle screw cement augmentation in patients with pathologic vertebral fractures due to metastatic disease.

Methods:

Systematic search of PubMed, MEDLINE, and Embase was performed in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, and the Cochrane Handbook for Systematic Reviews of Interventions.

Results:

Six studies comprising 240 patients (mean age, 62.1 years; 52.9% male) met inclusion criteria. The most common primary malignancies were lung (17.4%), breast (12.6%), and kidney (10.5%). Surgical approaches included percutaneous (82%) and open (18%) pedicle screw fixation. Fenestrated screw cement augmentation was performed in 70% of cases, while 30% underwent a vertebroplasty-type approach. Short-segment fixation was used in 80% of patients. Mean visual analog scale (VAS) pain scores decreased from 7.10 preoperatively to 3.52 postoperatively. Reported complications were low, including cement extravasation requiring intervention (0.5%), hardware failure (5.2%), and revision surgery (2%).

Conclusion:

Given the often-palliative nature of surgery in this population, cement augmentation of pedicle screws using minimally invasive short constructs for metastatic spinal fractures demonstrated significant pain relief with low complication and revision rates, thereby limiting additional morbidity.



Early Versus Delayed Fixation of Tibial Plateau Fractures: A Systematic Review and Meta-Analysis

Soroush Nedaie (PGY2), Darren Van Essen, Riley Sierhaus, Pascal Mailhot

Background:

To mitigate soft tissue complications, staged fixation is often favoured for high-energy tibial plateau fractures. However, optimal timing remains controversial, with emerging evidence suggesting early fixation may be beneficial in select cases. This systematic review and meta-analysis compared outcomes between early and delayed fixation.

Methods:

A systematic search of MEDLINE, PubMed, and EMBASE was conducted through November 17, 2025, following PRISMA guidelines. Studies comparing early versus delayed fixation of tibial plateau fractures were included. Primary outcomes were infection and reoperation, while secondary outcomes included operative time, nonunion, wound dehiscence, length of stay, and hospital costs. Pooled odds ratios and mean differences with 95% CIs were calculated via inverse variance in R using fixed-effects models, with random-effects applied when $I^2 > 50\%$.

Results:

Eleven studies comprising 911 patients were included (mean age 43.7 years; 39.3% female; mean follow-up 22.1 months). Most were high-energy injuries—predominantly Schatzker IV–VI and AO/OTA 41-C patterns. Mean time to definitive fixation was 32.0 (early) versus 182.5 hours (delayed). Early fixation significantly reduced superficial infection (OR 0.30, 95% CI 0.14–0.66), deep infection (OR 0.57, 0.33–0.98), and reoperation (OR 0.55, 0.34–0.86). Wound dehiscence and nonunion were comparable. Length of stay was significantly shorter with early fixation (MD –6.98 days, –7.61 to –6.34). Operative time trended shorter but was non-significant (MD –17.0 minutes, –39.1 to 5.1). Healthcare costs were lower with early fixation across all three reporting studies.

Conclusions:

In appropriately selected tibial plateau fracture patients, early fixation—including in complex patterns—significantly reduces infection and reoperation rates compared to delayed fixation, with comparable nonunion and wound dehiscence. Early fixation was associated with shorter hospital stays and lower healthcare costs. Surgeons should consider early fixation as a safe and resource-efficient strategy.



PROMS Stand up: No difference in Pre- or Post-op Patient Reported Outcomes in Patients with Single or Bilateral Knee Osteoarthritis

Colleen Nesbitt (PGY3), Robert Downey, Abdu Etagiuri, Devin Proulx, Dr. Van Der Merwe

Background:

The number of concomitant painful arthritic joints affecting the patient has been previously posited to affect post-operative knee specific patient reported outcome measures (PROMS) after total knee arthroplasty (TKA). This can alter our understanding of the success of these procedures in this patient population. This study aimed to determine the effect of ongoing symptomatic contralateral knee arthritis in patients after total joint arthroplasty on post-operative PROMS.

Methods:

We compared knee-specific outcome measures (KOOS-JR, OKS) from two cohorts: patients receiving a single TKA and patients receiving staged, bilateral TKA's. PROMS were collected preoperatively and at six weeks follow up. Data was collected on additional known confounders of PROMS including age, ASA grade, mental health, general health, radiographic severity of arthritis, and back pain. Post-operative PROMS were compared between the two groups using Mann Whitney U tests to determine statistical significance and established minimal clinical differences of the outcome's measures.

Results:

A total of 110 patients were included in the study. 59 patients had only symptomatic unilateral knee osteoarthritis, and 51 patients had symptomatic bilateral knee arthritis. There were no differences in baseline characteristics of age, sex, ASA score, mental health and general health, and arthritis severity between the two groups. There were no statistically significant differences between the two cohorts in OKS (22.1 vs 19.3; $p=0.13$) or KOOS-JR (50 vs 47; $p=0.21$).

Conclusion:

Postoperative improvements in knee-specific post-operative PROMS were similar between cohorts and did not exceed established minimally clinically improved differences between groups. The presence of a contralateral symptomatic knee arthritis does not adversely affect short term PROMS following TKA.



Comparing the Accuracy of Pre-Operative Templating Techniques for Total Hip and Knee Arthroplasty

Luca Ramelli (PGY1), Aaron Campbell, Steve Mann, Gavin Wood, Fernando Diaz Dilernia

Background:

When planning total hip (THA) and knee arthroplasty (TKA), a radiographic marker is used to determine the magnification of the joint for templating. However, there is no consensus on where this marker should be placed. This study aimed to compare three different hip radiographic marking locations to determine the most accurate templating method. We also sought to compare the templating accuracy of a staff surgeon to residents.

Methods:

We retrospectively reviewed 223 patients who received a THA, hemiarthroplasty (HA), or a TKA. We compared preoperative templated cup and stem sizes by the staff surgeon and residents to actual implant sizes and recorded templating method to determine accuracy. Lastly, we compared preoperative templated femur sizes to actual implant sizes to determine the accuracy of TKA templating.

Results:

The median difference in templated cup and stem sizes versus actual sizes was zero for the staff surgeon ($n = 144$) and $+1/-1$ for the residents ($n = 25$). The interclass correlation coefficient (ICC) when comparing the staff surgeon's and residents' hip templates to the actual implant used was 0.84 and 0.73, respectively. When comparing the rates of templating accuracy (cup and stem correctly) across the three methods of radiograph marking, there was no significant difference in templating accuracy ($p = 0.51$). When comparing the staff surgeon's knee templates to the actual implant used, the ICC was 0.92.

Conclusion:

Our study found no significant difference in the rates of accuracy between three methods of preoperative radiographic templating for hip arthroplasty. We found that the staff surgeon was more accurate overall with their templating when compared to the residents, as determined by differences in ICC scores. Overall, THA and TKA method of templating may ultimately come down to surgeon preference, as there is no clear accuracy advantage that one method provides over the other.



Biomechanical Impact of Splint Rods in Posterior Cervicothoracic Fixation: A Finite Element Analysis

Jaskaran Singh, (PGY3), Ian Polyzois Sara Gustafson, Trevor Gascoyne,
PMichael Goytan

Background:

Posterior cervicothoracic fixation is biomechanically challenging due to the transition between the mobile lordotic cervical spine and rigid kyphotic thoracic spine. Hardware failure can occur through rod fracture, screw loosening, or failure at the bone-screw interface. Splint rods may improve construct performance, but their biomechanical impact in cervicothoracic constructs remains incompletely defined.

Methods:

Finite element analysis was used to simulate eight posterior cervicothoracic fixation constructs in a C7 vertebrectomy model with C5–T2 fixation. Construct variables included rod material, titanium versus cobalt-chrome; presence or absence of splint rods; splint rod diameter, 3.5 mm versus 4.5 mm; and lateral mass screw diameter, 3.5 mm versus 4.0 mm. Boundary conditions replicated ASTM F1717 and ISO 12189 standards. Constructs were tested under worst-case loading with ramped displacement to 2 cm. Outcomes included maximum load capacity, yield displacement, construct stiffness, and stress distribution.

Results:

The highest-performing construct used 3.5 mm titanium primary rods with 3.5 mm titanium splint rods, achieving the greatest load capacity of 107 N and stiffness of 29.8 N/mm. The lowest-performing construct used single 3.5 mm titanium rods without splint rods, with a load capacity of 66 N. The primary predicted failure mode occurred at the lateral mass screw-bone interface. Increasing construct stiffness through larger splint rods, larger lateral mass screws, or cobalt-chrome rods did not consistently increase load capacity and, in some configurations, shifted stress toward the screw-bone interface.

Conclusions:

Splint rods improved load-bearing capacity in posterior cervicothoracic fixation constructs. However, increased stiffness alone did not reliably improve construct performance, emphasizing the importance of balanced load-sharing. These findings may help guide construct optimization and reduce the risk of hardware failure in complex cervicothoracic surgery.



Effect of Creatine Supplementation on Functional Recovery and Lean Body Mass After Primary Total Hip Arthroplasty (THA): A Randomized, Double-blind, Placebo-controlled Trial

Abdulwahab Aladsani (PGY1), Paul Kulyk, Johannes Van Der Merwe, Phil Chilibeck

Rationale:

Pre-operative sarcopenia is a recognized factor that increases a patient's risk of post-operative complications and decreases their ambulation capacity. Combating sarcopenia in the aging population is a possible pathway towards improving patients' outcomes. Multiple studies suggest that there are benefits to creatine supplementation in the aging population in regard to lean body muscle mass, several studies mention a possible benefit to creatine even without resistance training. The aim of this study is to assess the effect of creatine supplementation on patients undergoing THA.

Methods:

Double blinded randomized Placebo control trial, Patients will be randomized into a control arm and a treatment arm. Patients will be contacted pre-operatively regarding participation in the trial. Patients will be started on Creatine 10mg/day or placebo 14 days preoperatively until 63 months postoperatively. Upon admission to the study, patients will have mid-thigh diameter of both thighs measured and they will be started on either the control or treatment. Upon discharge, patient information will be collected from SCM system (Participation with PT on day 1, length of hospital stay, complications, type of surgery, mortality. Patients will be followed up at 6 weeks, 3 months and 1 year. During each follow-up patients will undergo seat raise test from chair in 30 seconds (up and go test), walking speed test and answer HOOS, JR questionnaire. Patients will undergo DEXA scanning at the admission and 3 months follow-up. Patients will be placed on a standardized hip physiotherapy protocol.

Results and Conclusion:

Pending.



Associations Between Pre-Medical Participation in Competitive Fields, Athletic Ability and Surgical Skill Acquisition

Andrew Fast (PGY4), Mikko Vorster, Chason Nudler, Luca Ramelli, Evan Abram, Ben Wightman, Soroush Nedaie, Josh Garafolo, Tess Bracken, Darren Van Essen, Jaskaran Singh, Nick Steiner, Dan Ogborn, Robert Longstaffe

Background:

Surgical skill acquisition in medical students is influenced by many factors, yet the role of physical fitness and extracurricular activities remains poorly understood. This study examined whether baseline physical attributes and participation in athletics, gaming, or music predict performance on multiple simulated surgical tasks.

Methods:

Twenty-three first- and second-year medical students completed a suture task assessed via the Objective Structured Assessment of Technical Skills (OSATS), arthroscopic simulator task for time, an orthopaedic drill skill task for depth and trajectory, and a suturing task scored with OSATS. Physical measures for athleticism included grip strength, countermovement jump height (CMJ), and grooved pegboard for dexterity. Participants reported demographics as well as athletic, gaming, music and other high performance activity participation levels via survey. Group comparisons, Pearson correlations, and multivariate regression were performed.

Results:

Surgical training was associated with better suturing scores (OSATS1: 11.57 vs. 7.57, $p=0.021$) and drill trajectory (2.33° vs. 3.81° , $p=0.007$). Males had longer scope times (47.82 vs. 38.62 s, $p=0.014$) and females had greater drill depth error (14.90 vs. 11.49 mm, $p=0.047$). Strength correlated with scope time ($r=0.42-0.45$, $p<0.05$) and trajectory error ($r=0.50-0.51$, $p<0.01$). CMJ inversely correlated with drill depth error ($r=-0.56$, $p=0.002$), and dominant pegboard time correlated with angled drill error ($r=-0.45$, $p=0.023$). Physical measures collectively predicted drill depth error ($R^2=0.35$, $p=0.043$) and straight trajectory error ($R^2=0.38$, $p=0.019$). No significant associations were found between athletics, gaming, or music participation and any surgical outcome.

Conclusions:

Physical fitness, particularly grip strength and lower extremity power, shows meaningful associations with orthopaedic procedural performance in novice medical students, while prior procedural experience independently predicts suturing skill. Extracurricular activities conferred no significant advantage at this training level. This data could suggest that physical fitness and athleticism can predict surgical performance and that improved fitness may improve surgical performance in trainees.



Combined Tibial Tuberosity Avulsion and Patellar Tendon Rupture in Adolescents: A Scoping Review and Case Report

Darren Van Essen (PGY3), Monther Abuhantash, Dan Ogborn, Lori Anne Archer

Background:

Concomitant tibial tuberosity fracture and patellar tendon rupture is an exceptionally uncommon injury. A rising incidence is suspected, highlighting the importance of appropriate diagnosis and management. We present a representative case and scoping review of the literature to synthesize diagnostic features, management strategies, and outcomes for this injury.

Methods:

PubMed, MEDLINE, EMBASE, and Web of Science were searched through October 20, 2024. Eligible studies included case reports and series describing acute tibial tuberosity fractures with distal patellar tendon ruptures in adolescents. Demographic, injury, imaging, fixation, rehabilitation, and outcome data were extracted in blinded duplicate. In our case, a 15-year-old male underwent fixation of a tibial tuberosity fracture and patellar tendon repair, followed by early progressive motion and return to sport physiotherapy.

Results:

Of 425 studies screened, 26 met inclusion criteria, comprising 34 patients. The mean age was 14.5 ± 1.5 years, with 8.8% female. Basketball (35.3%) and soccer (17.6%) accounted for most injuries. Most fractures were Ogden 2B (37%) and 2A (17%), and the mean radiographic angle of rotation of the tuberosity fragment was $149.3 \pm 43.4^\circ$. A minority of cases utilized CT (18%) and MRI (38%) imaging. Most cases utilized cancellous screws for fracture fixation and Krackow suture techniques with suture anchors or osseous tunnels for tendon repair. Postoperative immobilization averaged 3.9 ± 2.2 weeks, and weight-bearing began at 3.9 ± 2.6 weeks. Overall, 97% of patients achieved full range of motion and strength. Our patient similarly achieved complete functional recovery and returned to high-level sports by ten months.

Conclusions:

Our results demonstrate that patients with this uncommon injury achieve high rates of functional restoration following appropriate surgical management and rehabilitation. The findings reinforce recently published evidence highlighting key radiographic features that may facilitate early recognition and accurate diagnosis of this rare but significant injury pattern.



Annual Consult Volume of an Orthopaedic Trauma Service at a Major Canadian Centre

Benedict Wightman (PGY1), Jaskaran Singh, Dr. Ted Tufescu

Background:

Musculoskeletal trauma and infections are among the most common reasons for presentation to emergency departments worldwide^{1,2}. Health Sciences Centre Winnipeg is the only tertiary trauma centre in the province of Manitoba, receiving critically injured and unstable patients from Manitoba, northwestern Ontario, and Nunavut.

Methods:

This study retrospectively analyzed one year's worth of consult records from the adult orthopaedic trauma service in order to quantify the number and types of consults received, and whether these consults resulted in patients being admitted, operated on, or followed by the service.

Results:

From October 2023 to September 2024, the orthopaedic trauma service at HSC Winnipeg received 2218 consults total, of which 1700 were for trauma and 482 were for infections. 710 consults resulted in admission to orthopaedic surgery, 1101 consults resulted in booking for surgery, and 854 were managed non-operatively. 51% of consults were received during night-call hours, and a significant seasonal variation in consults was demonstrated, peaking in August 2024.

Conclusions:

These results demonstrate that the orthopaedic trauma service at HSC Winnipeg sees operative volumes comparable to the largest level 1 trauma centres in Canada, and have identified several avenues for further study, including improving efficiency during night-call hours, adjusting the allocation of operating room resources based on seasonal variation, and determining the impact the significant number of infection-related consults has on resource utilization in this centre.



AI-Assisted vs. Conventional literature Search in Orthopaedics: A comparative Analysis of Evidence Quality, Consistency, and Clinical Interpretability

Dr. Gavin King (PGY2), Dr. Evan Parchomchuk, Jessi Robinson, Abdelrafour Houdane, William Dust, Johannes M. van der Merwe

Background:

Artificial intelligence (AI) tools are increasingly used for orthopaedic literature reviews, but their reliability compared to conventional systematic searches remains unclear. This study compares AI-assisted and conventional searches across two clinical questions, focusing on quality, consistency, and interpretability of evidence.

Methods:

A conventional literature search evaluated (1) simultaneous versus staged total knee arthroplasty (SB-TKA vs S-TKA) and (2) total hip arthroplasty versus hemiarthroplasty (THA vs HA) for hip fractures. Studies were screened using predefined criteria and scored based on design (0–5), directness (0–3), and sample size (0–3), generating total scores (0–11) and evidence tiers (A–E). High-quality studies informed conclusions. Standardized queries were used for AI (SciSpace, Elicit, Consensus, OpenEvidence) searches, with results cross-referenced against the conventional search. All AI-identified studies were included. Mean study weights and overlap were assessed.

Results:

For SB-TKA vs S-TKA (2.33 million patients), conventional analysis showed higher complication rates with SB-TKA in 52% of studies, while functional outcomes and satisfaction were largely equivalent. SB-TKA had shorter cumulative length of stay. High-quality subgroup analysis showed no major demographic or outcome differences (mean weight Tier B, 7.42). AI searches demonstrated similar trends with slightly lower and more variable evidence weights (Tier B–C, 6.3–7.8).

For THA vs HA (41,203 patients), mortality and complication rates were similar. THA showed superior long-term function and quality of life, while HA had shorter operative time, less blood loss, and shorter hospital stay. High-quality studies confirmed these findings (Tier B–A). AI results were consistent but less comprehensive.

Conclusion:

AI and conventional searches yield similar high-level conclusions; however, AI lacks precision, does not stratify study quality, and may oversimplify findings. Conventional searches remain the gold standard, while AI is best used as a supplementary tool for rapid screening and summarization.

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We acknowledge that we live and work on Treaty 6 Territory and the Homeland of the Métis.
We pay our respect to the First Nations and Métis ancestors of this place and reaffirm our
relationship with one another.