



UGME FALL RESEARCH SYMPOSIUM

October 26, 2023 | 3:00 PM – 6:00 PM PST

THURSDAY, OCTOBER 26, 2023

Chair: Dr. Lise Leveille

Review Panel: Michael Bond, Fay Leung

Note:

1. All presentations are strictly limited to **4 minutes**, followed by a **4-minute** discussion period with the review panel
 2. Virtual attendees are encouraged to submit questions using the Zoom “Chat” function. Presenters will respond to these questions using Zoom “Chat” after their presentation has been completed.
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1500 – 1505:

Welcome and Opening remarks – Dr. Lise Leveille

Research Presentations (4 min. presentation + 4 min. discussion)

1505 – 1513: (virtual)

Aron Weingarten - *Optimal Time to Initiate Treatment for Pediatric Patients with Femoral Shaft Fractures: A Scoping Review*
(Dr. A. Cooper)

1513 – 1521:

Marianna Hsu - *The Women in ORTHopaedics Workshop Provides Early Exposure to Orthopaedic Surgery for Young Women. A Pre- and Post-Event Survey Comparison.* (Dr. E. Schaeffer)

1521 – 1529:

Jackson Robinson - *Scoping Review to Assess External Weight Bearing Monitoring Devices for Use in Lower Extremity Fracture Patients* (Dr. D. Stockton)

1529 – 1537:

Taewoong (Peter) Chae - *Assessment of Educational YouTube Videos on Proximal Humeral Fracture Treatment* (Dr. A. Huang)

1537 – 1545:

Christie Yang - *Assessing the Impact of COVID-19 on Health Resource Utilization by Pediatric Patients with Cerebral Palsy* (Dr. S. Miller)

1545 – 1553:

Rory Trevorror - *Perioperative Management of Juvenile Idiopathic Arthritis (JIA) in Anterior Cruciate Ligament (ACL) Reconstruction* (Dr. L. Leveille)

1553 – 1601:

Cameron Leong - *Burnout in Canadian Orthopaedic Surgeons* (Dr. A. Cooper)

1601 – 1611:



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October 26, 2023 | 3:00 PM – 6:00 PM PST

Break

1611 – 1619:

Marisa Wong- *Patient Engagement for Quality Improvement and Knowledge Translation in Orthopaedic Care* (Dr. A. Cooper)

1619 – 1627:

Yasaman Yaghoub - *A case-control study to evaluate the role of swaddling in developmental dysplasia of the hip* (Dr. A Smith)

1627 – 1635:

Brandon Chai - *Evaluation of Educational YouTube Videos for Distal Radius Fracture Treatment* (Dr. A Huang)

1635 – 1643:

Alissa Zhang – *Crossing the Tibial Physis in Prepubescent ACL Reconstructions – Is it Safe?* (Dr. L Leveille)

1643 – 1651:

Bennett Stothers - *Delayed Diagnosis of Developmental Dysplasia of the Hip, Slipped Capital Femoral Epiphysis, and Legg-Calves-Perthes Disease in British Columbia* (Dr. K Mulpuri and Dr. Schaeffer)

1651 – 1659:

Josh Dyce - *Timing of Antibiotics in Treating Paediatric Musculoskeletal Infections: A Systematic Review* (Dr. A. Cooper)

1659 – 1707:

Sophia Katramadakis - *Orthopaedic Implant Migration in the Femur After a Sideways Fall Impact* (Dr. P. Guy and Dr. P. Cripton)

1707 – 1715:

Review Team Closing Comments

1715 – 1730:

Career in Orthopaedics Information Session with Dr. Fay Leung, Residency Program Director

1730 – 1800:

Canapes, Refreshments and Networking

1505 – 1513: (virtual)

Optimal Time to Initiate Treatment for Pediatric Patients with Femoral Shaft Fractures: A Scoping Review

Authors: Aron Weingarten, Anushka Pujari, Harpreet Chhina
Supervisor: Dr. Anthony Cooper

Purpose: To analyze the literature to assess the optimal time to treatment, with the goal of informing future Canadian Orthopaedic Association guidelines for the treatment of pediatric femoral shaft fractures.

Methods: The scoping review methodology was guided by PRISMA Extension for Scoping Reviews. A comprehensive search was conducted in Medline, Embase and CINAHL databases, with the search limited to articles in English. The subject headings and keywords used in the search strategy best represented the search concepts defined as Pediatric Patients, Time to Initiate Treatment, and Femoral Shaft Fractures. Articles obtained were imported into Covidence where duplicates were removed. Two reviewers independently screened the full text of the articles to identify articles that meet the inclusion criteria and extracted relevant data to assess the optimal time to intervention for pediatric patients with femoral shaft fractures.

Results: At time of abstract submission, 648 articles were identified as eligible for inclusion. The next steps are for two reviewers to independently screen the abstracts for full-text review and data extraction.

Conclusion: This work is in progress. Once complete, our review will synthesize updated information about the optimal timing to intervention for pediatric patients with femoral shaft fractures to improve clinical outcomes.

1513 – 1521:

The Women in ORTHopaedics Workshop Provides Early Exposure to Orthopaedic Surgery for Young Women. A Pre- and Post-Event Survey Comparison

Authors: Marianna Hsu, Hayley Spurr, Anthony Cooper
Supervisor: Dr Emily Schaeffer

Purpose

Women are underrepresented in orthopaedic surgery, evidenced by 16% representation of female residents in 2020. In response, our Orthopaedics Department developed an orthopaedic curriculum tailored to young women in grades 10-12. The inaugural Women in ORTHopaedics (WORTH) workshop was held on June 10, 2023, aiming to deliver early exposure to different career options in orthopaedic surgery for young women and provide access to resources for ongoing skill development and knowledge acquisition. This event served as the inaugural step in establishing a longitudinal program aimed at engaging young women globally.

Methods

Participants completed a preliminary survey prior to the workshop. The workshop consisted of five hands-on sessions: Saw Bones, Orthopaedic Devices, Research, Engineering Applications, and Casting; followed by career panels. Another survey was administered following the workshop consisting of the same questions as the pre-survey, with additional questions regarding their event experience to assess changes to implement for future WORTH events. Participants shared their impressions of orthopaedics, interest in pursuing a career in this field, and awareness of available career pathways within this discipline. Additionally, the post-event survey included questions to gauge their inclination toward future WORTH participation.

Results

Of the 128 attendees, 104 (81.25%) responded to the pre-event survey, and 56 (43.75%) responded to the post-event survey. Pre-event impressions of orthopaedics included sentiments such as “being new to this field” and “wanting to learn more.” Following the workshop, respondents reported that “[orthopaedics] encompasses a much larger range of subjects than expected” and “[is] a surprisingly diverse field with many opportunities

for those with different interests.” When comparing pre- and post-survey responses, there was an increase in interest in pursuing a career in orthopaedics after the workshop (55.32% to 65.45%). Furthermore, 100% expressed that they would attend future WORTH events, evidenced by registration for the next event outpacing the inaugural workshop.

Conclusion

Findings indicate that WORTH played a constructive role in guiding young women toward trajectories beyond secondary education.

1521 – 1529:

Scoping Review to Assess External Weight Bearing Monitoring Devices for Use in Lower Extremity Fracture Patients

Authors: Jackson Robinson
 Supervisor: Dr. David Stockton

Purpose/Hypothesis:

Orthopaedic surgeons commonly prescribe weight-bearing parameters for their patients for a variety of reasons. Weight-bearing may be limited in order to modulate the strain environment of a fracture as it heals, or to protect soft tissues. Advancing a patient’s weight-bearing status is usually done as quickly as possible given the patient’s injury, in order to minimize tissue atrophy and disuse osteopenia and maximize functional recovery. However, it is entirely unclear to what extent these prescriptions are followed in practice [1]. The purpose of this scoping review is to identify methods and devices currently used for the external measurement of lower extremity weight bearing post fracture via literature review.

Methods:

Database searches of MEDLINE and EMBASE were completed to identify relevant studies. Titles were screened for relevance and abstracts were screened against the eligibility criteria. We identified studies that investigated the use of external force, pressure, or activity monitoring devices used in adults after lower extremity fracture.

Title and abstract screening were completed by the primary author (JR). An additional search of clinicaltrials.gov, the WHO International Clinical Trial Registry Platform (ICTRP), Networked Digital Library of Theses and Dissertations (NDLTD), Dissertations and Theses Global and Grey Matters was completed to identify unpublished literature. Reference lists of studies meeting inclusion criteria after full text review were scanned to identify additional relevant literature. Results were documented in a pre-defined charting form.

Results:

Results are summarized in Table 1 below.

Insole pressure or force monitoring	12
Step count or activity monitor	17
Instrumented external fixator or cast	9
Force plate	4
Pressure-sensitive film	1

Table 1: Summary of Weight Bearing Measurement Devices

35 studies were found to meet inclusion criteria. A total of 12 studies used insole pressure or force monitoring, 17 used step count or activity monitoring, 9 used an instrumented external fixator or cast, 4 used force plate monitoring and 1 used pressure sensitive film. Multiple studies used more than one method of measurement.

Conclusions:

A variety of methods used for weight bearing monitoring were found in the literature. The identified devices will be assessed for cost and feasibility of implementation for use in a preliminary study to explore adherence to non-weight bearing instructions following lower extremity fractures at local sites.

1529 – 1537:

Assessment of Educational YouTube Videos on Proximal Humeral Fracture Treatment

Authors: Taewoong Chae, Brandon S. Chai
Supervisor: Dr. Adrian Huang

Purpose/hypothesis: Social media platforms have become important sources of information for many, and nowadays patients are able to gather information for themselves even before coming to see a physician. With the large volume of information available for people online, it is important to assess what type of information is available for patients so that they can be best informed on their conditions. As proximal humeral fracture (PHF) is a common type of orthopedic trauma injuries, we aimed to assess the characteristics of videos specifically on PHF and PHF treatment.

Methods: The terms “Proximal Humeral Fracture” and “Proximal Humeral Fracture Treatment” were used to gather the videos included in this study. Terms were searched programmatically using YouTube’s search Application Program Interface on July 30, 2023. Top 50 videos from each search term were recorded and combined for a total of 100 videos. Duplicate videos were removed, and the remaining videos were rank ordered by the frequency and order of appearance from the initial search. Any non-English videos or videos irrelevant to the topic were excluded. Out of the 64 videos remaining, the first 50 rank-order videos were included in the study. Data collected from the videos were categorized into general parameters (e.g. number of views, video length), source parameters (e.g. publisher affiliation, number of subscribers), and video content (e.g. topic discussed, media type).

Results: The most common countries of origin were the United States (29/50) followed by India (11/50). Publisher affiliation was most commonly commercial (27/50). Healthcare professionals or students were the more common target audience (32/50) than patients (18/50). The predominant media type was lecture-style presentation (23/50), followed by demonstration (10/50).

Conclusion: While this study did not evaluate the quality of individual videos, we explored the characteristics of the videos that patients see most often. The huge diversity and volume of videos is remarkable and offers patients opportunities to inform themselves, but future studies should evaluate the quality of the videos objectively to minimize misinformation.

1537 – 1545:

Assessing the Impact of COVID-19 on Health Resource Utilization by Pediatric Patients with Cerebral Palsy

Authors: Christie Yang, Maria Juricic, Emily Schaeffer, Kishore Mulpuri
Supervisor: Dr. Stacey Miller

Purpose: Cerebral palsy (CP) is the most common cause of motor impairment or disability in children. The functional level of affected patients is typically stratified using the Gross Motor Functional Classification System (GMFCS), and the needs of patients are variable both within and between these functional levels. Management of CP and its associated issues requires both medical and surgical attention from allied health professionals including physiotherapy, occupational therapy, and speech language pathology. However, the recent COVID-19 pandemic caused significant delays and discontinuations in many of these services. Disrupting patients’ continuous access to routine checkups and rehabilitation services can result in worsening comorbidities. The purpose of this study is to evaluate service use by patients with CP across the

GMFCS levels during the pandemic, including the type and frequency of service utilization. There is also an opportunity to compare service utilization from a previous survey administered pre-pandemic.

Methods: The prospective cross-sectional survey will be administered to caregivers of children with CP by research staff in the orthopaedic clinic at BC Children’s Hospital. The information being collected will include patient and caregiver demographics and healthcare utilization of services by listed care providers.

Results: To date, 90 responses have been collected with recruitment ongoing. Current data shows that children at GMFCS level III or higher usually require more frequent healthcare services. Many state financial/accessibility issues as the primary obstacle rather than the pandemic. The majority of virtual healthcare visits were for services that did not require physical examinations including dietitians and social work.

Conclusions: No definitive conclusions can be made until study completion. Once around 200 responses are recorded, next steps will be to finalize the data on the number and frequency of visits. The data will be compared to the pre-pandemic study to see if there is a significant change in the results.

1545 – 1553:

Perioperative Management of Juvenile Idiopathic Arthritis (JIA) in Anterior Cruciate Ligament (ACL) Reconstruction

Authors: Rory Trevorrow, Joyce He, Kristin Houghton
Supervisor: Lise Leveille

Background: Juvenile idiopathic arthritis (JIA) refers to a group of conditions of unknown etiology characterized by joint inflammation presenting prior to 16 years of age and persisting for a minimum of 6 weeks duration. JIA may co-occur with other musculoskeletal injuries and diseases, including anterior cruciate ligament (ACL) rupture. In the paediatric population, early operative management of ACL rupture is associated with a decreased likelihood of joint instability, pathological laxity, and symptomatic meniscal tears compared to non-operative management. In children with JIA, the inherent inflammatory environment of the joint may interfere with post-surgical healing and rehabilitation. As such, optimal management of disease activity in the perioperative period may be critical to improve surgical outcomes and reduce complication rates following paediatric ACL reconstruction.

Objective: The aim of the present study is to determine best practices for the medical management of JIA during the perioperative period of pediatric ACL reconstruction.

Methods: Existing literature on the management of inflammatory arthritis in the perioperative period was gathered through a structured search of MEDLINE, Embase and CINAHL databases. A combination of keywords and subject headings related to juvenile arthritis, ACL reconstruction, orthopaedic procedures, and perioperative care was used to identify articles with potential relevance. In addition, recent cases of ACL reconstruction in patients diagnosed with JIA will be identified from the health records of BC Children’s Hospital and reviewed for trends in JIA management and surgical outcomes.

Preliminary Results: A total of 1688 references were identified by the initial search, with 1296 references remaining after the removal of duplicates. Title and abstract screening by a single reviewer yielded 298 articles for full-text review. A collection of 45 studies were found to include information related to the management of JIA in the perioperative period or the perioperative risks of medications commonly used for the treatment of JIA.

Implications: The findings of the present study may serve to guide the management of DMARDs, corticosteroids, and other antirheumatic medications in the perioperative period. Optimal medical management of JIA in the perioperative window could serve to improve surgical outcomes and reduce complication rates for paediatric ACL reconstruction and other orthopaedic procedures.

1553 – 1601:

Burnout in Canadian Orthopaedic Surgeons

Authors: Cameron Leong, Josh Dyce, Harpreet Chhina
Supervisor: Dr. Anthony Cooper

Purpose/Hypothesis: Burnout is defined as a high amount emotional exhaustion (EE), depersonalization (DP), and a low sense of personal achievement (PA). Occupational burnout in physicians has negative implications for the physician, their family, their patients, and to the healthcare system as a whole. Burnt-out physicians are more likely to make medical errors and have a detached view of their patients. They are at an increased risk for depression, substance abuse, and suicide. Furthermore, moral distress, defined as the inability of an individual to act according to their core values and perceived obligations due to internal and external constraints, was found to be significantly associated with burnout amongst critical care providers. We aimed to determine the prevalence of burnout in Canadian orthopaedic surgeons using the Maslach Burnout Inventory (MBI), identify risk factors for burnout, and evaluate the association between moral distress and burnout in orthopaedic surgeons. This is the first nationwide study assessing burnout in orthopaedic surgeons since the beginning of the COVID-19 pandemic.

Methods: Orthopaedic attending surgeons, residents, and fellows will be identified through the Canadian Orthopaedic Association and invited to participate in the study. Full length MBI surveys and demographics forms will be administered to all participants. An additional optional survey, the Measure of Moral Distress for Health Care Professionals (MMD-HP) will be administered to measure moral distress. Surveys will be administered on REDCap and responses will be kept strictly anonymous.

Results: An initial pilot study was conducted in the department of Orthopaedics at senior author's institution. At the time of abstract submission, 27/35 respondents completed the full length MBI and 15/35 respondents completed the MBI and the MMD-HP. 12/27 (44.4%) of respondents who completed the MBI were determined to be at risk for burnout based on their survey responses.

Conclusion: Our initial results suggest that the prevalence of burnout amongst orthopaedic surgeons in the UBC orthopaedics department is alarmingly high. The next step of our project will be to collect and evaluate data on a national level.

The findings from this study will help us gain a better understanding of physician burnout in Canada, facilitate future research on burnout mitigation strategies, and help inform policy to prevent burnout. Prevention of physician burnout will have positive benefits not only to physicians, but their families, their patients, and the healthcare system as a whole.

1601 – 1611:

Break

1611 – 1619:

Patient Engagement for Quality Improvement and Knowledge Translation in Orthopaedic Care

Authors: Marisa Wong, Dr. Harpreet Chhina
Supervisor: Dr. Anthony Cooper

Purpose/Hypothesis: There has been an ideological shift to increase the relevance of knowledge to users, resulting in quality-improvements (QI) in clinical practices. This QI project centers on the limb reconstruction clinic in the Orthopaedic Department where access to patients and caregivers with a diverse range of diagnoses and treatment experiences provides a unique opportunity to co-create our patient-engagement program. This project aims to create more patient-engagement opportunities to better learn the concerns of

our patients and caregivers to create resources that speak to those needs. It aims to establish collaboration with patients and caregivers to co-create patient resources. This project aims to create patient engagement opportunities, implement changes, and receive feedback to improve the quality of our care and research. By creating a number of different engagement opportunities our aim is to provide a safe space for our patients and caregivers to provide feedback about their care and involvement in research.

Methods: Patient families that had expressed interest in a patient-engagement program were invited to participate in focus-groups. Participation was open to patients from all ethnic groups and genders. After the initial call for participation, separate invitations were sent to ensure that there is representation from a heterogeneous group of patients. A patient-partner leading the focus groups met with members of the research team to generate topics of discussion. During focus group sessions, discussions were aided by Mentimeter, a software that allows participants to create live word-maps. Topics discussed include the content of our registries, satisfaction with the questions in the quality-of-life surveys, and preferences for the future creation of knowledge translation. Knowledge translation materials were then created in collaboration with patient-partners to be shared on our social media platforms, website and clinic TV displays.

Results: Resulting projects are ongoing and include creating patient spotlights and patient directories, increased mental health support, gathering rooms, and resource directories. Work-in-progress also includes creating animated videos and posters about previous and current research projects, and clinical information.

Conclusions: This project will provide valuable information about patient and caregiver experiences in research and create a system to address patient and caregiver feedback to improve their quality of care.

1619 – 1627:

A case-control study to evaluate the role of swaddling in developmental dysplasia of the hip

Authors: Bryn O Zomar, Emily K Schaeffer, Ashleen Khatra, Yasaman Yaghoub, Sharon Ho, Vuong Nguyen, Kishore Mulpuri
Supervisor: Dr. Anya Smith

Purpose: While a link between swaddling and hip dysplasia (DDH) has been suggested for several decades, there have been few epidemiological studies specifically investigating this relationship. The aim of this study was to assess whether a relationship exists between swaddling and DDH through a case-control study design.

Methods: Case and control participants were identified from a global prospective registry of and public posting, respectively. Control participants were healthy children without a history of DDH. Parents of eligible children completed a one-time survey to collect demographics, birth details, known risk factors for DDH and swaddling history. We calculated summary statistics for the risk factors and multivariable logistic regression to measure the association between swaddling and DDH.

Results: 237 cases and 287 control participants were included. A higher proportion of cases had known risk factors for DDH than controls, including breech birth (41.1% vs 9.1%), female sex (83.5% vs 47.0%) and family history (27.0% vs 5.6%). A higher proportion of controls were swaddled than cases (72.5% vs 48.5%). When including a binary swaddling variable, we found those who swaddled to have lower odds of DDH than those who did not (OR 0.40, 95% CI 0.25, 0.64). When including swaddling events per week and duration of each event instead, we found decreased odds of DDH with each added event (OR 0.76, 95% CI 0.69, 0.83) and increased odds of DDH with increased event duration (OR 1.34, 95% CI 1.21, 1.50).

Conclusion: As expected, more case participants had known risk factors for DDH than controls. Surprisingly, however, fewer case participants reported swaddling their child than control participants. We also found a surprising negative relationship between swaddling and DDH opposite to what the previous literature reports. The results of this study suggest that swaddling event duration may be more important in the development of DDH than simply whether swaddling occurred. However, we caution interpretation of our results as recruitment

of the control population was likely biased towards those who swaddled their children as we were required to indicate in our advertisements that we were investigating how swaddling relates to DDH.

1627 – 1635:

Evaluation of Educational YouTube Videos for Distal Radius Fracture Treatment

Authors: Brandon Chai
Supervisor: Dr. Adrian Huang

Purpose Distal radius fractures (DRFs) are one of the most common fractures in adults. Adequate patient education is crucial for adherence to treatment. YouTube is a popular, accessible resource that has become a valuable for obtaining health information. The current study evaluates the top 50 YouTube videos on DRF treatment for patient education.

Methods A systematic search was conducted in Youtube using 3 searches to obtain 150 videos. Duplicate, non-relevant, paid and non-English videos were removed and the top 50 rank-ordered videos were reviewed and characterized in terms of general (views, likes, video length and publication date), source (publisher affiliation, presenter type and target audience) and content (media type, topic coverage, advertisements and bias) parameters.

Results Only 56% of videos were directed towards patients versus 40% for healthcare providers, highlighting a gap in patient-oriented educational content on YouTube. Most (86%) videos included effective visual aids, aligning with best practices for educational videos. Operative management was overrepresented in 64% of the videos as opposed to non-operative management in 34% of videos. Only a 31% of patient-oriented videos discussed surgical complications. Home exercises were emphasized in 75% of the videos discussing recovery topics.

Conclusions Although YouTube has the potential to be an effective resource for disseminating health information to patients, it has several limitations for education in DRF treatment including the lack of patient-oriented educational videos, overrepresentation of operative treatment and lack of information on surgical complications. Nonetheless, YouTube may have an important role as a supplementary resource, especially in certain topics such as guiding post-operative recovery with home exercises.

Clinical Relevance

This study allows healthcare providers and content creators to proactively address information gaps identified in educational YouTube videos on DRF treatment. It helps characterize the role of YouTube in supporting the treatment and recovery of patients suffering DRFs.

1635 – 1643:

Crossing the Tibial Physis in Prepubescent ACL Reconstructions – Is it Safe?

Authors: Alissa Zhang, Dr. Christopher Reilly
Supervisor: Dr. Lise Leveille

Purpose: Anterior Cruciate Ligament (ACL) tears in skeletally immature patients have increased due to earlier high-risk sport participation and earlier sports specialization. With increasing early operative management in this population, several physeal-sparing ACL reconstruction techniques are typically used to avoid growth disturbances. However, physeal-sparing techniques can be technically challenging, potentially compromising graft fixation and tunnel placement. This study assesses the safety of transphyseal ACL reconstruction in skeletally immature patients.

Methods: This is a retrospective review of skeletally immature patients (females ≤ 11 years old, males ≤ 13 years old) who received transphyseal fixation for ACL reconstruction at BC Children’s Hospital between January 2010 and May 2021 with >1 year follow up. Clinical data and radiographic data were collected.

Results: Eighteen patients met inclusion criteria (male $n=16$, 88%). Average age at surgery was 12 years (range 8-13, SD 1.46). All patients received transphyseal fixation on the tibial side. On the femoral side, 19 patients had a physeal sparing technique (12 epiphyseal fixation, 7 iliotibial band) and 1 received transphyseal fixation. Mean follow-up duration was 26 months (range 12-56 months). Seventeen patients (94%) had full length standing radiographs obtained >1 -year post-operative. No clinically significant cases of leg length discrepancy or genu varum were identified. One instance of bilateral genu valgum was documented post-operatively clinically and radiographically. There was a significant difference in medial axis deviation, by around 8mm increased valgus alignment at the operative knee (6.41 ± 6.97 , compared to -1.12 ± 7.60 ; p-value 0.003). There was a significant difference in the mechanical lateral distal femoral angle (83.67 ± 2.46 , 85.37 ± 2.19 ; p-value 0.03) and anatomic lateral distal femoral angle (78.48 ± 2.67 , 80.15 ± 2.16 ; p-value 0.03), and femoral length (459.78 ± 29.53 , 457.34 ± 29.80 ; p value 0.03), suggestive of femoral origin to the genu valgum identified radiographically in this study population.

Conclusion: There were no significant complications associated with ACL reconstruction using tibial transphyseal fixation in our study population. Radiographic genu valgum on the operative knee was identified postoperatively without radiographic evidence of valgus deformity in the tibia, suggestive of a femoral origin. This study provides preliminary support for crossing the tibial physis during ACL reconstruction in skeletally immature patients.

1643 – 1651:

Delayed Diagnosis of Developmental Dysplasia of the Hip, Slipped Capital Femoral Epiphysis, and Legg-Calves-Perthes Disease in British Columbia (Research in Progress)

Authors: Bennett Stothers, Renee Boldut
Supervisors: Dr. Kishore Mulpuri and Dr. Emily Schaeffer.

Purpose/ Hypothesis: Developmental Dysplasia of the Hip (DDH), Slipped Capital Femoral Epiphysis (SCFE), and Legg-Calves-Perthes Disease (LCPD) are three hip disorders in children. Diagnosis of these conditions in a timely manner is critical for hip health. For DDH, diagnosis is largely reliant on newborn screening programs. There are multiple screening methods described in the literature including ultrasound, physical exam, or both. Delays in diagnosis have been related to errors in screening and less severe presentations. Factors related to delayed diagnosis of SCFE include low socioeconomic status (SES), stable presentation, and presentation with distal thigh or knee pain. LCPD has the least information available however one case review related a presentation of painless limp and stiffness to delayed diagnosis. The purpose of this project is to investigate the diagnosis times for these condition in BC and examine factors related to increased diagnosis time.

Methods: We will perform both a retrospective chart review and cross-sectional interviews to collect data on time to diagnosis of these conditions and related risk factors for patients presenting at BC Children’s Hospital (BCCH). For each condition we will collect: number and type of imaging studies, number and type of medical visits, number and type of medical imaging, sex assigned at birth, age at diagnosis, whether the family has a family doctor or not, the side that is affected, family history of the condition, and SES. Additional variables related to each specific condition will also be collected. These will include different risk factors, like breach pregnancy for DDH and BMI for SCFE, and different severity measures, like slip angle for SCFE and lateral pillar classification for LCPD. For our cross-sectional participants, we will also generate journey maps to illustrate how they got to their diagnosis. We will also ask participants open ended questions to learn about their experience getting a diagnosis and any barriers they experienced.

Results / Conclusion: This project is currently in progress and data collection will be starting soon.

1651 – 1659:

Timing of Antibiotics in Treating Paediatric Musculoskeletal Infections: A Systematic Review

Authors: Josh Dyce, Thomas Thordarson, Gourav Jandial, Harpreet Chhina
Supervisor: Dr. Anthony Cooper

Purpose/Hypothesis

Musculoskeletal (MSK) infections pose a significant cause of morbidity in the paediatric population. One key method of treatment for these infections is the administration of antibiotics. While a significant amount of literature exists which offers guidance on the optimal antibiotic duration and the best time to switch between intravenous and oral antibiotics, there is no clear consensus on whether antibiotics should be withheld until tissue cultures are taken. The purpose of this review is to compare the efficacy of pre-tissue culture versus post-tissue culture administration of antibiotics in treating paediatric MSK infections.

Methods

Four databases (CINAL, EMBASE, MEDLINE, Cochrane Central) were searched using tailored search strategies with no date restrictions for English-language articles. Included studies for the review will include studies of paediatric MSK infection patients who receive antibiotics before or after a tissue culture is done. Studies relating to post-operative MSK infections will not be included. After removing duplicates, two authors independently screened abstracts. A full-text review will be conducted independently by two authors based on inclusion/exclusion criteria, with a third author resolving disagreements. Data extraction will include year of publication, author details, study type, location, demographics, infection details, antibiotic usage, outcomes, and relevant biomarkers. A risk of bias assessment will be conducted to assess the quality of information presented in the studies, and synthesis of the findings will be performed upon the completion of data extraction. A meta-analysis will not be performed.

Results

3171 studies were imported for screening, from which 903 duplicates were removed. At the time of abstract submission, 260 study abstracts have been screened with 64 studies being saved for full-text review. So far, the screened articles which have been most relevant to the search have included case reports, case series, retrospective reviews and prospective studies.

Conclusions (Potential Impact)

The results of this review have the potential to guide clinical practices to improve outcomes and quality of life for affected children by optimizing the usage of antibiotics in MSK infections. This review may also demonstrate a need for randomized controlled trials to experimentally compare the outcomes observed between pre-culture and post-culture antibiotic administration.

1659 – 1707:

Orthopaedic Implant Migration in the Femur After a Sideways Fall Impact

Author: Sophia Katramadakis
Supervisors: Emily Bliven, Peter Cripton, Pierre Guy

Purpose: Many elderly adults are particularly vulnerable to subsequent hip fractures, which can lead to severe outcomes, including disability and mortality. Internal fixations are one of the most common and effective methods for the treatment of hip fractures, and in some cases, are used as a preventative measure in vulnerable patients to strengthen the femur in hopes of preventing a fracture. With an increase in the number of surgeries due to the growing elderly population, it is important to understand how these surgical fixations act in response to traumatic impacts. Here we propose a method to quantify migration of an orthopedic implant within the bone after impact from a simulated sideways fall. Specifically, this study proposes a quantitative measurement method, using three-dimensional registration of the pre and post fall femur.

Method: Six cadaveric pelvis-femur specimens (H1388, H1393, H1398, H1495, H1407) were implanted with the Gamma Nail and lag screw as a means of prophylactic augmentation and were tested using an inverted pendulum sideways fall impactor. All six specimens have the pelvis and both proximal femurs sectioned at the mid-thigh with the joint capsule carefully maintained during dissection. CT scanned images of both the pre and post fall configurations were used to obtain masks of the femur and Gamma Nail, in order to study implant migration in 3D space. Implant migration after impact was measured in the medial-lateral direction for the lag screw, inferior-superior direction for the nail, and anterior-posterior direction for both the nail and lag screw for all six specimens.

Results: The resulting data showed that generally the highest level of migration occurred for lag screw in the anterior-posterior direction with an average migration value across all six specimens of 2.25mm. The lowest level of migration generally occurred for the nail in the anterior posterior direction with an average migration value across all six specimens of 1.01mm. The overall highest migration was seen by H1398's lag screw in the anterior-posterior direction with a value of 4.05mm posteriorly, and the overall lowest migration was seen by H1388's lag screw in the medial-lateral direction with a value of 0.30mm laterally. Finally, there were no signs of femur fracture or gross migration in any of the six specimens.

Conclusion: Our findings address the study's aim to understand the migration behavior of surgically implanted orthopedic implants in response to traumatic impacts, a factor in improving orthopedic treatments for elderly patients. Understanding implant migration is not only important for assessing the robustness and reliability of the implant but also for anticipating potential complications in traumatic situations. Through this deeper exploration into the migration behaviors of the Gamma Nail, we contribute valuable insights for the next generation of femoral fixation devices. This understanding can aid in preventing additional injuries adjacent to an orthopedic device, thereby enhancing patient outcomes.

1707 – 1715:

Review Team Closing Comments

1715 – 1730:

Career in Orthopaedics Information Session with Dr. Fay Leung, Residency Program Director

1730 – 1800:

Canapes, Refreshments and Networking
