Department of Pediatrics
University of Saskatchewan
Presents

2025 Child Health Research Trainee Day

Thursday April 3, 2025
12:00 pm - 4:00 pm

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JIM PATTISON CHILDREN'S HOSPITAL FOUNDATION

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SASKATCHEWAN PEDIATRIC RESEARCH AND INNOVATION GROUP

Child Health Research Trainee Day
Thursday, April 3, 2025
12:00 pm - 4:00 pm

12:00 - 1:00 pm Lunch

12:25 - 12:30 pm Welcome and Opening Remarks **(Dr. Darryl Adamko)**

12:30 - 1:15 pm **Dr. Katharine Smart** (Keynote Speaker) *How advocacy can deepen and expand your impact in your career*

1:30 - 3:00 pm Long Presentations

Dr. Rheanna Bulten (Resident - Pediatrics)
Dr. Siobhan Thornton (Resident – Pediatrics)
Dr. Savio Nguyen (Resident – Pediatrics)
Dr. Amanda Dancsok (Resident – Pediatrics)
Dr. Lauren Campbell (Resident – Pediatrics)
Craig Eling (PhD-Health Sciences)
Kristina Sobolewski (PhD-Kinesiology)
Ali Rezaei (PhD-Kinesiology)

11:15 – 11:45 am Poster Presentations (Category 1 - Graduate & Postgraduate)

Karlee Schoff (MSc-Pharmacy & Nutrition)
Chloe Langen (MSc-Pharmacy & Nutrition)
Thomas Jurrissen (Post Doctoral Fellow- Western College of Vet Medicine)
Faly Golshan (Post Doctoral Fellow- Psychology & Health Studies)
Rosina Darcha (PhD-College of Nursing)

11:15 – 11:45 am Poster Presentations (Category 2 – Graduate)

Emma Finch (PhD-College of Medicine)
Rafique Khan (PhD-Kinesiology)
Adam Luchkanych (PhD-Western College of Veterinary Medicine)
Matthew Chapelski (PhD-Kinesiology)

11:15 - 11:45 am Poster Presentations (Category 3 - Undergraduate)

Sarah Al-Mouaiad Al-Azem (Undergraduate-Kinesiology)
Samantha Bundas (Undergraduate-Medicine)
Taylor Dennison (Undergraduate-Medicine)
Rachel Kirk (Undergraduate-Kinesiology)
Aidan Doleman (Undergraduate-Kinesiology)
Lorynn Labbie (Undergraduate-Medicine)
Mahrukh Masood (Undergraduate-Medicine)

3:15-3:45 pm Poster Presentations (Category 4 – Residents)

Dr. Anulika Nwakaeze (Resident - Anesthesiology)

Dr. Huyen Vu (Resident - Obstetrics & Gynecology)

Dr. Karan Purewal (Resident - Pediatrics)

Dr. Jacqueline Harvey (Resident - Pediatrics)

Drs. Julie Le/ Jessyca Brissaw (Resident - Pediatrics)

3:15-3:45 pm Poster Presentations (Category 6 – Residents)

Dr. Devon Christoffel (Resident - Pediatrics)

Dr. Devynn McKenzie (Resident - Pediatrics)

Dr. Jessica Pappin (Resident - Pediatrics)

Dr. Julia Zdybal (Resident - Pediatrics)

Dr. Kara Place (Resident - Pediatrics)

Dr. Heather Oland (Resident - Pediatrics)

Dr. Olivia Boden (Resident - Pediatrics)

Dr. Sarah White (Resident - Pediatrics)

4:00 pm Closing Remarks (Dr. Darryl Adamko)

Dr. Katharine Smart

Presents

How can advocacy deepen and expand your impact in your career?

Katharine Smart is an experienced medical leader and advocate who constantly challenges the status quo in medicine. With over 20 years in pediatrics her current clinical focus is creating innovative and collaborative partnerships to serve marginalized children in rural and remote areas. She is the clinical lead for the Yukon's Autism diagnostic clinic. Dr. Smart is a past president of the Canadian Medical Association (CMA), where in 2021 she became the 10th woman to serve in the organization's 155-year history. A fierce and authentic leader, she has become a recognized and respected medical voice in Canada. Dr. Smart has been recognized as one of Canada's 100 Most Powerful Women, with the Medical Post's Changemaker Media Award and the Waterfalls Global Award. In recognition of her work establishing a social pediatrics program in the Yukon she was recognized with a Yukon 125 commemorative medal awarded for impact and embodiment of the values of leadership and reconciliation. She has held many leadership positions including president of the Yukon Medical Association. She sits on the boards of Ronald McDonald House charities, ACTUA a STEM education outreach organization for youth and SE Health. Dr. Smart is a passionate communicator and sought-after media expert, keynote speaker, panelist and podcast guest. She is the host two podcasts- Health Signals and SPARK: Conversations, Children's Healthcare Canada's monthly podcast series.

Long PRESENTATIONS
1:30 - 3:00 pm

Non-invasive Ventilation in Pediatric Bronchiolitis: Variables Related to Weaning Readiness and Efficiency

Rheanna Bulten, Greg Hansen, Tanya Holt

Background: Non-invasive ventilation (NIV) is emerging as a standard approach in managing bronchiolitis in PICU. There is a lack of evidence related to weaning NIV. The purpose of this study was to identify variables related to NIV weaning readiness, efficiency, and approach in bronchiolitis.

Methods: Retrospective chart review of 74 children, less than 2 years of age with bronchiolitis, on NIV and admitted to pediatric intensive care unit (PICU) from 2022 to 2023. Medical chart reviews were completed and documented demographic variables, clinical metrics and NIV mode; total and weaning duration. Descriptive statistics were used for demographic data, and difference of means or Fisher's exact test were used for further data analysis.

Results: Mean total duration of NIV therapy was 40 hours and wean time 13 hours. Duration on CPAP alone was shorter (26 hours) than for children on combination of BiPAP and CPAP (45 hours, 95% CI 4.258 to 33.742, P = 0.0123). Wean times were also shorter for children on CPAP alone (mean 5 hours) than children on BiPAP and CPAP (mean 16 hours) (95% CI 1.899 to 20.101, P = 0.0185). Patients were more likely to have a 'complex wean' (see methods) with BIPAP (44.6%) than with CPAP (18.8 %). Respiratory Rates (RR) at time of weaning initiation were 45.7bpm versus 39.3bpm respectively. RR at first wean was a significant predictor of NIV weaning duration (p=0.007).

Practice variation in the management of edema in childhood nephrotic syndrome: A Canadian survey

Siobhan Thornton, Cherry Mammen, Susan Samuel, Kayla Flood

Background: Nephrotic syndrome (NS) is a commonly acquired pediatric kidney disease, often resulting in substantial edema from the accumulation of fluid within the interstitial tissues. Edema management varies widely due to differences in clinical assessment, practice variation, and lack of consensus guidelines. How physicians manage edema within individual clinical scenarios, and the extent of practice variability, remains unclear.

Objective: This study aims to better understand the scope of clinical management of edema for children with pediatric NS within Canada, related to: (a) pharmacologic and non-pharmacologic interventions, (b) clinical decision making, and (c) perceived complications.

Design/Methods: We conducted a cross-sectional survey of pediatric nephrologists and trainees across Canada using REDCap®. The survey included a variety of question types (yes/no response, Likert scale, free response), covering demographics, practice variation, and responses to a clinical vignette describing a 3-year-old boy with NS who presented with normal vital signs and laboratory values despite clinical edema and 30% cumulative fluid overload.

Results: Forty-one pediatric nephrologists and trainees completed the survey, with around half (53.3%) having over 10 years of experience. Respondents felt that patients with a new NS diagnosis required admission primarily due to edema (76.9%) (Table 1). Most (62%) reported an average admission length of 48-72 hours. Admission decisions varied, with 41.2% opting for admission and 38.2% unsure based on the same clinical vignette. A majority (84.6%) frequently used albumin for edema management, perceiving a low risk of complications, though pulmonary edema remained the greatest concern (Table 2). Edema management was primarily stopped based on clinical symptoms (74%), improvements in physical exam findings (63%), and complete resolution of edema (46%). At discharge, 85% of physicians recommended fluid restriction, and all recommended salt restriction during relapses to prevent edema recurrence.

Conclusion(s): Edema remains the primary reason for hospital admission in children with nephrotic syndrome (NS), yet there is notable variation in admission criteria and recommended therapies. Albumin infusions are commonly administered, but their application varies widely, and the frequency of related complications remains uncertain. This variability highlights a lack of clinical research and the absence of consensus guidelines for managing edema in NS. Randomized trials studying edema management are essential to establishing evidence-based guidelines and standardized clinical protocols.

Characterization of the postnatal course of HDFN: Data from a Provincial prenatal Alloimmunization Management Program.

Savio Nguyen, Sheila Anthony, Oksana Prokopchuk-Gauk, Sheila Harding, Georgina Martin, Paula Lehto Kim Thomson, Sarah Tehseen

INTRODUCTION:

Hemolytic disease of the fetus and newborn (HDFN) occurs due to transplacental maternal antibodies (IgG) targeting fetal red blood cell antigens. It is a heterogenous condition with clinical presentation ranging from asymptomatic and self-limiting anemia to severe anemia, bilirubin encephalopathy and hydrops fetalis. Degree of hemolysis is based on the immunogenicity of the antigen-antibody complex, the titre of maternal antibodies, and the timing of expression of certain antigens on fetal RBC. Interventions correspond to severity of HDFN. Prenatal management of HDFN is well-established, however there is a paucity of literature regarding the postnatal course leading to a dearth of recommendations for postnatal surveillance and management. This study aims to determine the relationship between the maternal alloantibody type, titer, and disease severity and ascertain the time to resolution of isoimmune hemolytic anemia in infancy.

METHODS:

This study follows a retrospective cohort design. Provincial laboratory information system was queried for maternal antibody type, titers, neonatal RBC antigen status, direct antiglobulin test (DAT) and antibody screen for pregnancies from February 1, 2020 to December 31st, 2023. Prenatal RBC antibody detection and titration was performed via automated gel analyzers with a titer of 64 considered critical for non-Kell antibodies. Data was collected on all neonates born to alloimmunized mothers with a positive cognate RBC antigen who received intrauterine transfusion and/or required intervention for hemolytic anemia. Neonatal electronic medical records were reviewed for the first 100 days of life for hemoglobin, bilirubin, hemolytic markers and transfusion of red cells or IVIG. Clinical variables included type of intervention, duration of hospitalization, readmission for jaundice or anemia and time to resolution of hemolytic anemia.

RESULTS:

Clinically significant antibodies were identified in 424/76,542 (0.5%) expectant patients. 87/424 (21%) of these pregnancies had fetuses carrying the cognate RBC antigen. Of these, 43/87 (49%) fetuses or neonates required treatment for hemolytic anemia. 23/87 (26%) required readmission for hyperbilirubinemia.

CONCLUSION:

Hemolysis was evident in half of the neonates with alloimmunized mothers and a positive cognate antigen. Alloimmunization to E antigen was most frequent in this cohort with varying severity of HDFN. Consistent with current literature, HDFN was most severe due to D alloimmunization with a longer duration of anemia and need for erythropoiesis-stimulating agents and transfusions. Hemolytic anemia resolved by 60 days for all cases of alloimmunization except those that required IUT and had D-alloimmunization. This research provides a basis to formulate data-driven recommendations for post-natal surveillance of HDFN.

HEMATOLOGIC MANIFESTATIONS OF EARLY CONGENITAL SYPHILIS

Amanda R Dancsok, Rupeena Purewal, Georgina Martin

BACKGROUND: Syphilis (Treponema pallidum) is a sexually- or vertically-transmitted infection that was thought to be virtually eradicated in the 1940's with the discovery of penicillin as an effective treatment; however, infection rates across North America have recently had a dramatic resurgence, and since 2018, Canada has seen an increase of 599% in reported cases of congenitally-acquired syphilis infections [1]. Though hematologic sequelae (anemia, thrombocytopenia) are generally considered possible features of congenital syphilis, there remains little published evidence documenting the modern manifestations.

OBJECTIVE: To describe and characterize the hematologic findings of early congenital syphilis, in order to reach a better understanding of the incidence, severity, course, and management of these sequelae.

coagulopathy.

METHODS: This study represents single-center retrospective cohort analysis of all patients (under 24 months of age) treated for confirmed or probable congenital syphilis between January 2017 and July 2023 at the Jim Pattison Children's Hospital in Saskatoon, Saskatchewan, Canada. Electronic medical records were reviewed for: demographics, syphilis serologies, maternal treatment history, medical and infectious comorbidities, physical findings, laboratory investigations, transfusion data, and mortality. Infants with congenital rubella or cytomegalovirus, hemolytic disease of the newborn, or neonatal alloimmune thrombocytopenia were excluded.
RESULTS: This cohort included 189 cases, of which 40.7% had hematologic sequelae. Anemia, adjusting for age and gestation, was observed in 15.2% of cases, predominately (53.8%) normocytic. Red blood cell transfusion was performed in 11.1% of total cases (81% of cases with anemia). Thrombocytosis was seen in 11.1% of cases, while thrombocytopenia was present in 23.5%. Platelet transfusions were given to 9.5% of all cases. Leukocytosis was observed in 22.2% of cases, and of these, 34% had marked monocytosis. Leukopenia was seen in 8.7% of cases, with neutropenia in 2.6% of cases (severe neutropenia in 1 case). Coagulation studies were performed in only 15% of cases, often in the setting of clinical DIC, and of these, 10.0% had elevated INR, 57.1% had elevated aPTT, and 33.3% had hypofibrinogenemia. Among all cases, 8.5% received plasma product transfusions. The overall mortality was 3.2%, and all of these cases had severe coagulopathy.
CONCLUSIONS: Hematologic findings are common in early congenital syphilis, often in the absence of any other symptoms. While severe sequelae are rare (<10%), these findings were present in all cases of mortality associated with congenital syphilis.

Review of Antimicrobial Use for Pneumonia on 4F Pediatrics

Lauren Campbell, Magdalena Koziak, Dr. Abid Lodhi, Dr. Shauna Flavelle, Sabiha Sultana, Sanjida Newaz.

Antimicrobial stewardship is a critical focus in modern healthcare, especially with the growing concerns of antimicrobial resistance. Respiratory distress and pneumonia are common reasons for pediatric hospital admissions and indications for antibiotics. This retrospective chart review assesses antimicrobial use for patients admitted to the pediatric unit (4F) at the Regina General Hospital (RGH) and how current practices align with recommendations outlined by the Canadian Pediatric Society (CPS) and Firstline guidelines for the management of pneumonia.
The study reviewed patients admitted over a 12-month period with an admitting diagnosis of pneumonia, asthma exacerbation, viral upper and lower respiratory tract infections (URTI/LRTI), respiratory distress, or bronchiolitis. The primary outcome was to evaluate whether patients are receiving the appropriate antimicrobial therapy for pneumonia, as per CPS and Firstline guidelines. The secondary outcome focused on the duration of intravenous (IV) antibiotics before transitioning to oral (PO) antibiotics, which can impact duration of hospitalization and overall antibiotic use.
Data analysis is underway to review both primary and secondary outcomes. By identifying gaps between current antimicrobial practices and established guidelines, the study will aim to guide improvements in prescribing habits. If discrepancies are found, the development of a Practitioner Order Set will be proposed, specifically for use in the emergency department and pediatric ward. This practitioner order set will provide clear guidelines for selecting antibiotics, such as ceftriaxone versus ampicillin, based on patient indications. A future phase of this project will involve repeating the review after the implementation of the order set to assess whether adherence to the guidelines improves.

Using the COM-B Model to Identify the Facilitators of and Barriers to Digital Health Literacy in Pediatric Rheumatic Disease: A Scoping Review

Craig Eling, Alan M. Rosenberg, Jennifer N. Stinson, Maryam Mehtar, Jasmin Bhawra, Mary Chipanshi, Roona Sinha, & Donna Goodridge

Sustainable Development Goal 3 Ensure healthy lives and promote well-being for all at all ages; Sustainable Development Goal 10 Reduce inequality within and among countries

Background
Digital health literacy (DHL) encompasses the skills and knowledge required to use the Internet, various devices, and electronic communication for learning about, managing, and communicating about health.
This use of technology and the Internet for health, which is known as digital health, has the potential to address the unique health needs and challenges faced by children and adolescents (C&A) with pediatric rheumatic disease (PRD), as well as their caregivers. The aim of this scoping review (ScR) was to identify the facilitators of and barriers to DHL in this population and map the findings to the Capability, Opportunity, and Motivation Model of Behaviour (COM-B model).
Methods
This ScR applies the Joanna Briggs Institute (JBI) scoping review framework and follows the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) guidelines. Studies are limited to those identifying facilitators of and barriers to DHL in C&A (0-19-years-old) with PRD and/or their primary caregivers. English-language quantitative, qualitative, and mixed-methods research articles published since 1974 (the year the term *health literacy* was developed) from any healthcare field were included. Grey literature, complementary and alternative medicine studies, and review articles were excluded. Titles and abstracts, followed by full text, were screened for inclusion by three independent researchers, who also independently extracted the data. Identified facilitators of and barriers to DHL were first open coded, then mapped to the COM-B criteria.
Discussion
7537 studies were identified, with 40 studies being included for data analysis. Fifty-five facilitators of and barriers to DHL for C&A with PRD and caregivers of C&A with PRD were coded from these studies. Prior to mapping these to the COM-B, demographic factors, such as age and gender, were removed. This is because they are non-modifiable individualistic factors that cannot be altered through behaviour modifications. The facilitators and barriers mapped to the COM-B criteria of capability (physical and psychological), motivation (reflective and automatic), and opportunity (physical and social) provide an understanding of the underlying domains of behaviours. This information can be used by policy makers and health care providers to bolster existing DHL in the PRD population, while using behavioural interventions to target factors than minimize DHL.

Fostering Student Wellness using Movement Integration in the Classroom

Kristina Sobolewski, Dr. Alexandra Stoddart, Dr. Lee Schaefer, Dr. Louise Humbert, and Dr. Marta Erlandson

Introduction:
Less than 40% of Canadian children and youth are meeting Canada's physical activity (PA) guidelines. This is concerning as there are numerous benefits to being physically active. To address this issue and declining rates of PA, researchers and educators have developed movement integration (MI) opportunities (short bursts of PA) that can be implemented in the classroom during regular school time. However, many MI interventions targeted for children and youth fail to include their perspective, especially in Canada. The minimal research that does exist relies on singular qualitative methods, which overlooks children's and youth's diverse preferences and abilities.
Purpose: The purpose of this research was to assess students' PA, wellbeing, and capture students' experiences in a 12-week MI intervention using a write, draw, show and tell (WDST) methodology.
Methods:
All students (N = 297) from grades five to seven in two schools participated in a 12-week MI intervention. A trained facilitator implemented two 5-minute MI sessions per week at both schools and all teachers (N = 14) implemented those two MI sessions on different days that week. Students (n = 129) who provided parental written informed consent and written assent completed a set of questionnaires before and after the MI intervention to assess their PA behaviours, learning, and wellness. Additionally, a sub-sample of 5 students (n = 57) per classroom in grades five to seven participated in a WDST group discussion to share their experiences with the MI intervention.
Results:
There were no significant differences from pre to post-intervention however, grade five students had significant differences in PAQ-C scores ($p = .002$) and grade six students demonstrated significant differences in self-efficacy for PA ($p = .015$) and global happiness ($p = .040$). A total of 11 WDST focus groups were conducted and six themes were generated: (I) active together with MI, (II) breaking up learning with MI, (III) fun-filled MI moments, (IV) recharging bodies and minds, (V) the downfalls of MI, and (VI) building better MI breaks.

Conclusion:
Incorporating MI throughout the school day does impact the level of PA students are exposed to. Students perceived MI activities positively; especially activities that were gamified compared to fitness-based and include socialization among peers. Involving younger demographics in MI interventions may help improve their PA experiences in school and inform future MI interventions.

Comparison of Bone and Muscle Development in Children with Type 1 Diabetes and Their Typically Developing Peers: A 1-Year Follow-Up with Advanced Imaging

Ali Rezaei, Munier Nour, James Johnston, Saija Kontulainen

Sustainable Development Goal 3 – Good Health & Wellbeing

Altered bone and muscle development may contribute to the elevated fracture risk in children and adolescents with Type 1 Diabetes (T1D). However, prospective, advanced imaging data comparing bone and muscle changes is unavailable. Therefore, our objective was to assess annual changes in bone and muscle characteristics in children and adolescents with T1D compared to their typically developing peers (TDP).

We obtained bone and muscle properties, measured at baseline and 1-year follow-up using high-resolution peripheral quantitative computed tomography (HR-pQCT) and peripheral quantitative computed tomography (pQCT) scans from the Saskatchewan Bone Strength Development Study database. We included data from 20 participants with T1D (mean age 12.3, SD 2.7 years) and 32 TDP (mean age 10.7, SD 1.7 years). We compared follow-up bone and muscle properties, adjusted for baseline value, maturity offset, height, and body mass, using ANCOVA.

Annual changes in bone microarchitecture, estimated bone strength, and muscle density differed between T1D and TDP groups. At the distal radius, the T1D group had a lower increase in trabecular thickness (-3.8 µm, 95% confidence interval -7.4 to -0.2) and separation (-27.4 µm, -52.6 to -2.2), while the increase in trabecular number (0.1 /mm, 0 to 0.2) was greater in the T1D group. At the distal tibia, the T1D group had a lower increase in trabecular thickness (-3.7 µm, -7.2 to -0.2) and stiffness (-29.9 kN/mm, -53.5 to -6.3). Regarding muscle properties, the T1D group had a greater increase in muscle density at the forearm (75.0 mg/cm^3, 0.7 to 149.3).

Findings indicated differences in bone microarchitecture and muscle density development in children and youth with T1D compared to TDP. Lower increases in trabecular thickness at the distal radius and tibia, as well as less gain in estimated bone strength (stiffness) at the distal tibia, are concerning. However, the increase in trabecular number, less trabecular separation in the distal radius, and gain in forearm muscle density can be seen as favorable development. There is a need for prospective monitoring of bone and muscle development along with fracture incidence to better understand and prevent bone fragility development in children and adolescents with T1D.

Poster PRESENTATIONS
11:15 – 11:45 am
Category 1 - Graduate & Post Graduate

Composition of antenatal vs postnatal colostrum: A proof-of-concept-feasibility study

Karlee A Schoff, Naida Hawkins, Kelsey M Cochrane

Goal 2 (zero hunger) and Goal 3 (good health and well-being)

BACKGROUND: Colostrum is the first milk released from the mammary glands which is rich in antibodies and immunological components. Some women start producing colostrum before delivery (antenatal colostrum) and some obstetrical-focused clinicians in Saskatoon, SK currently provide More Milk Sooner antenatal colostrum collector kits at ~35-36 weeks' gestation as part of standard prenatal care. However, very little is known about antenatal colostrum expression, including whether the immunological composition of colostrum varies before and after delivery.

OBJECTIVES: This pilot study aims to: 1) provide proof-of-concept for recruiting individuals who plan to breastfeed for human milk-related research through the provision of More Milk Sooner kits in late pregnancy; **2)** gain estimates (mean ± SD) of immunomodulatory proteins (lactoferrin and secretory immunoglobulin A (sIgA)) in prenatal and postnatal colostrum specimens.

METHODS: This prospective observational pilot study aims to recruit n=60 generally healthy, low-risk pregnant individuals in Saskatoon, SK to provide an antenatal and postnatal colostrum specimen (0.5-1.0 mL each) through the provision of More Milk Sooner kits in obstetrical-focused clinics and recruitment posters displayed in patient rooms and through social media. Participants will collect colostrum specimens antenatally at ≥ 35 weeks' gestation (at home prior to delivery) and postnatally within ~24 hours after delivery (at Jim Patterson's Children's Hospital or home). All study materials will be provided in a More Milk Sooner study specific kit, including all supplies needed to collect colostrum specimens; detailed instructions will be provided and will be used to access two questionnaires (hosted on REDCap) after antenatal and postnatal colostrum collections. We will evaluate recruitment via total time to enroll n=60, and # of enrolled participants/total # of kits administered to clinics. Descriptive statistics will be used to summarize pilot data, including concentrations of lactoferrin and sIgA in antenatal and postnatal colostrum; a paired t-test (or non-parametric equivalent) will be used to compare paired measurements.

SIGNIFICANCE: There is limited evidence on the practice of antenatal colostrum expression; however, it may improve milk production, help to establish breastfeeding more quickly after delivery, and improve long-term breastfeeding success. The pilot data gained from this study can inform recruitment practices for future research to better understand the impact of antenatal colostrum expression on lactation, and improve our understanding of the compositional differences of colostrum antenatally and postnatally. Pilot data can be used to inform an adequately powered study to understand the clinical significance of prenatal vs postnatal colostrum composition for infant health.

Pasteurized Donor Human Milk for HIV-Exposed infants: A Pilot Trial

Chloe Langen, Rupeena Purewal, Alexandra King, Kelsey Cochrane

Goal 2 (zero hunger) and Goal 3 (good health and well-being)

To prevent HIV transmission through milk, formula feeding is recommended for those living with HIV. However, recent advances in antiretroviral therapies have also led to increased breastfeeding among those living with HIV, given a <5% risk of transmission with low or non-detectable viral loads. Human milk provides optimal nutrition for infants, as well as bioactive components that cannot be replicated in infant formula. Pasteurized donor human milk (PDHM) may benefit both breastfed and formula fed infants of those living with HIV. For breastfed infants, PDHM could permit caregivers to continue breastfeeding, without having to mixed feed, should the need to supplement arise (e.g., provision of infant formula while breastfeeding). For formula-fed infants, PDHM supplements formula, offering human milk benefits without HIV risk.

Despite its recognized immunological advantages in vulnerable infants (such as preterm or low birth weight infants), PDHM is primarily used in neonatal intensive care units (NICUs) and its feasibility for HIV-exposed infants outside of a hospital setting remains unknown. This study aims to evaluate the feasibility of providing PDHM for HIV-exposed infants in Saskatoon, Saskatchewan. This pilot trial in which we will recruit 10–20 caregivers of HIV-exposed infants who are being followed by Pediatric Infectious Diseases, SHA. Participants will receive PDHM for 6–8 weeks from two months postpartum. Throughout the study period, four home visits will be conducted to provide PDHM, assess caregiver experiences and infant tolerance. Data collection will include daily volume/frequency of PHDM provision, infant tolerance, any challenges with provision of PDHM (e.g., thawing, preparation, and storage or PDHM), infant weight gain, and any occurrences of illness or opportunistic infections (per SHA electronic medical records).Though not drawing Indigenous-specific conclusions, Indigenous communities are disproportionately impacted by HIV in Saskatchewan; to ensure culturally appropriate dissemination of findings and to inform next steps, we are working with Pewaseskwan (Indigenous Wellness Research Group) at the University of Saskatchewan. This collaboration will ensure that research priorities align with community needs and is guided by culturally relevant approaches. Findings will offer critical insights into the real-world challenges and feasibility of PDHM use in this population. Results will guide future research and program priorities based on patient experiences and confirm feasibility outside hospital settings. We aim to inform a future clinical trial to determine clinical benefits of PDHM provision in this population, ultimately aiming to expand infant feeding options and access to human milk for all HIV-exposed infants.

Acute isometric handgrip exercise does not improve cognitive performance in patients with Fontan circulation

Thomas J. Jurrissen, Adam M. S. Luchkanych, M. Rafique Khan, Marta C. Erlandson, Charissa Pockett, Kristi D. Wright, Corey R. Tomczak, T. Dylan Olver

Goal 3 Good health and well-being

Fontan circulation is associated with reduced cerebral blood flow and impaired cognitive performance. Isometric handgrip (IHG) exercise has been shown to improve cognitive performance, possibly by augmenting cerebral perfusion. However, such effects have only been observed in limited samples of healthy populations. Further, the role of exercise intensity in modulating these responses has not been studied. Therefore, we tested the hypothesis that acute IHG exercise will increase the neurovascular coupling response to a cognitive task as well as cognitive performance in an intensity-dependent manner in patients with Fontan circulation and healthy control groups. Blood pressure (finger cuff photoplethysmography), middle cerebral artery blood velocity (MCAv; transcranial Doppler), end-tidal CO_2 ($ETCO_2$, respiratory gas analyzer), and cognitive performance (N-2 back, targets working memory) were measured simultaneously following rest, low- (30% maximal voluntary contraction, 4 x 2-min contractions separated by 1 min rest periods), and high-intensity IHG (80% maximal voluntary contraction, 9 x 20-s separated by 1-min rest periods) in patients with Fontan circulation (n=5 (2f/3m), 18±3 years) and aged- and sex-matched healthy controls (n=5 (2f/3m), 18±3 years). Baseline mean arterial pressure was elevated (80±7 mmHg vs 87±10 mmHg), while MCAv (36±5 cm/s vs 23±8 cm/s), the cerebral vascular conductance index (CVCi, 0.46±0.05cm/s/mmHg vs 0.26±0.11 cm/s/mmHg) and $ETCO_2$ (40±3mmHg vs 30±4mmHg) were lower in patients with Fontan circulation relative to healthy control participants (P<0.0456). In response to N-2 back task, neither ∆%MCAv nor ∆%CVCi were different across IHG intensities (P≥0.9127). However, while the ∆%MCAv was not different between groups (P=0.8133), the ∆%CVCi was lower in patients with Fontan circulation relative to the healthy control participants (12±13% vs -19±31%, P=0.0013). The response time to the N-2 back was similar across IHG intensities and between groups (P≥0.2864). While N-2 back accuracy was not different across IHG intensities (P=0.8595), it was lower in the patients with Fontan circulation relative to healthy control participants following low-intensity IHG (88±2% vs 94±4%, P=0.0373). Overall, the data indicate that cerebrovascular dilation associated with neurovascular coupling is reduced in patients with Fontan circulation, and acute IHG exercise does not enhance cognitive performance in this clinical population.

Technology-Assisted Mindfulness for Emotion Regulation in Autistic Children: A Novel Approach

Faly Golshan, Ghita Wiebe, Susan Bobbitt, Amin Mousavi, Katelyn Tourigny, Marla Mickleborough

Goal 3 Good health and well-being

Autism is a rapidly increasing neurodevelopmental condition worldwide, with its growing prevalence posing a critical challenge for healthcare systems. Despite the rising demand for autism support, significant gaps remain in research on accessible, evidence-based interventions, particularly in the realm of emotion regulation.

This project aims to pioneer a Canadian study on technology-assisted mindfulness using a Canadian portable EEG device. We will investigate how home-based, technology-assisted mindfulness can support emotion regulation in autistic children. The proposed equipment for this project is a portable, non-invasive, lightweight Canadian EEG headband, MUSE™, which enables EEG data collection and neurofeedback monitoring at home. All instructions and visual neurofeedback cues will be accessible via the MUSE™ app (3+ plus) on smartphones for children. MUSE™ S (InteraXon, Inc., SCR_014418, Toronto, Ontario, Canada) measures cortical activity through four dry EEG sensors positioned across the forehead and behind the ears (AF7, AF8, TP9, and TP10), compared to a reference electrode (FpZ).

If the study demonstrates that this practice effectively supports emotion regulation, it could significantly reduce the need for frequent travel to therapy sessions, improving access to services for families. By offering a solution that can be implemented at home, this approach allows us to study how children develop emotion regulation skills in both home and school environments, addressing one of the most commonly reported challenges for this population.

This project will begin with a pilot trial to assess adherence and feasibility, followed by a longitudinal clinical trial. Our randomized controlled trial (RCT) will include four weeks of daily technology-assisted mindfulness exercises, with pre- and post-intervention assessments at Week 0 and Week 4. Participants will also be followed up at Month 2 and Month 6 to evaluate their continued engagement with the practice. Our primary objective is to compare pre- and post-intervention measures to assess the effectiveness of technology-assisted mindfulness. Our secondary objective is to examine long-term impacts on emotion regulation, interoceptive awareness, and executive functions, considering how these factors are influenced by post-intervention engagement. The technology-assisted mindfulness group will be compared to a simple breathing task group and a waitlisted control group. Participants will include Saskatchewan-based children aged 7–10 with a professional autism diagnosis. We aim to recruit at least 100 participants, with a minimum of 66 participants required for Repeated-Measures ANOVA, based on an a priori G*Power analysis, to assess within- and between-subject effects of time (Week 0 vs. Week 4) and group (technology-assisted, breathing task, waitlist). This study represents a groundbreaking investigation into technology-assisted mindfulness for autistic children, offering a novel, accessible, and home-based approach to enhancing emotion regulation.

A Scoping Review of the Perinatal Healthcare Experiences of Indigenous Childbearing People

Rosina Darcha, Jill M. G. Bally, Shelley Spurr,

Background: Globally, perinatal healthcare access, quality, and outcomes significantly vary between Indigenous and non-Indigenous childbearing people. This situation is precipitated by systemic barriers emanating from the longstanding effects of colonialization. Despite ongoing awareness of culturally safe perinatal care, Indigenous childbearing people continue to have challenging experiences. The purpose of this scoping review was to explore the perinatal healthcare experiences of Indigenous childbearing people to identify research gaps and inform future nursing interventions to improve the challenges of engaging in perinatal healthcare in this population.

Methods: The scoping review framework of Arksey and O'Malley was used in this study by searching, retrieving, and analyzing research papers from CINAHL, Ovid/Medline, PsycINFO, PubMed, and Web of Science.

Results: Nine peer-reviewed articles published between 2002 and 2021 were identified and analyzed. The experiences of Indigenous childbearing people who sought care during the perinatal period had their experiences classified into Positive, Negative, Complex, and Mediating. This scoping review reiterated the need for culturally safe healthcare, preferably delivered by Indigenous healthcare professionals in healthcare facilities situated in Indigenous communities.

Conclusion: It is crucial to continue to explore the perinatal healthcare experiences of Indigenous childbearing people through in-depth qualitative research to develop culturally safe interventions especially when life-limiting illnesses or life-threatening illnesses occur.

Poster PRESENTATIONS
11:15 – 11:45 am
Category 2 - Graduate

How Total Metabolome Compares to Creatinine Normalization for LC-MS Biomarker Analysis in a Respiratory Disease Model for Children Samples

Finch, E, Alyari, M, Michel, D, Adamko, D, El-Aneed

Liquid chromatography mass spectrometry (LC-MS) is the gold standard method for the quantification of metabolites. The quantification of metabolites is the method of choice for biomarker-discovery research and holds promise as tool for diagnosis. Urine biomarkers are ideal as urine is able to be collected non-invasively and is metabolite rich. Urine analysis requires a method of normalization to determine accurate metabolite concentrations which are not an artifact of hydration level. Creatinine is a commonly used method of LC-MS urine data normalization as its excretion is usually constant from the body and thus, can be used to normalize metabolite concentrations. However, in our previous work creatinine has shown to be an inaccurate method of normalization when comparing between children's samples.

Taking an overall concentration of metabolites from a urine sample and utilizing the overall signal from a variety of metabolites to normalize is an alternate method of normalization called the total metabolome. The method uses derivatization to determine the total signal from a representative subgroup of the metabolome, namely amine and phenol-containing metabolites, using HPLC-UV and uses this value to normalize. The purpose of our study is to evaluate the total metabolome normalization within cohorts of children's samples ages 3 and 5 to determine its ability to improve a biomarker diagnostic model regardless of age.
Based on a published method, a modified approach is used with a mixture of 24 anime or phenol containing metabolites to act as the representative sub metabolome for the total metabolome. 90 children's urine samples were collected. These urine samples were previously analyzed for LC-MS biomarkers for asthma. These biomarker values will be normalized using creatinine and total metabolome to determine if the total metabolome normalization method would allow for consistency across patient age cohorts.

When Hearts Race and Pressures Rise: Altered Exercise Pressor Reflex with Cardiac Abnormalities and Aging

M. Rafique Khan, Adam M. S. Luchkanych, Thomas J. Jurrissen, Cameron J. Morse, Sarah Al-Mouaiad Al-Azem, Enoch Yang, T. Dylan Olver, Corey R. Tomczak

Goal 3 Good health and well-being

The exercise pressor reflex describes the autonomic response that stimulates the cardiovascular system to maintain perfusion of blood flow to working skeletal muscle. However, the exercise pressor reflex is exaggerated in patients with heart failure with reduced ejection fraction (HFrEF) whereas it is blunted in congenital heart disease (CHD). While HFrEF and CHD are clinically diverse, there may be phenotypic overlap that could provide a shared thread for observed pressor responses in these patient groups. Furthermore, the existing evidence on the effect of aging between healthy young (HY) and old (HO) appears to be conflicting. We hypothesized that the pressor response would be blunted with aging and the presence of cardiac conditions. A retrospective analysis of the immediate heart rate (electrocardiography) and mean arterial pressure (finger photoplethysmography) change from rest to during a short (3-5 sec) single bout of maximum voluntary isometric handgrip contraction was performed in HFrEF, CHD, HY, and HO (HFrEF; n=20 (6 F), 61±9 yrs; CHD, n=47 (21 F), 13±3 yrs; HY, n=40 (20 F), 13±3 yrs; HO, n=22 (10 F), 61±6 yrs). Data was analyzed by 2 × 2 ANOVA (health status; healthy and cardiac condition × age; young and old). Data were extracted as the average of three cardiac cycles at rest and a single cardiac cycle at peak systolic blood pressure during MVC. The data revealed heart rate increase from rest to MVC declined with age (8.6±8.1 Δ%, p=0.0004) and health status (8.0±4.8 Δ%, p=0.0023). Multiple comparisons revealed the increase in heart rate from rest to MVC was less in CHD (9.8±5.9 Δ%, p=0.0049), HO (11.2±9.4 Δ%, p=0.0117), and HFrEF (16.9±12.4 Δ%, p<0.0001) than HY. Furthermore, mean arterial pressure increase from rest to MVC declined with age (p<0.0001), but not health status (p=0.1086). Lastly, independent sample t-tests revealed MVC was greater in HO than HY (28±13 vs. 15±8 kg, p<0.0001), but not between HO and HFrEF (28±13 vs. 24±10 kg, p=0.2148) nor HY and CHD (15±8 vs. 14±9 kg, p=0.8337). During small skeletal muscle mass contraction at maximal intensity, the pressor response is impaired with aging and the presence of cardiac conditions. Together, these altered cardiovascular responses to exercise may be implicated in the reduced exercise capacity and tolerance known in these respective groups.

Isometric handgrip exercise increases middle cerebral artery blood velocity in children with congenital heart disease

A.M.S. Luchkanych, R. Khan, N.G. Boyes, K.D. Wright, M. Erlandson, C. Pockett, C.R. Tomczak, T.D. Olver

Patients with congenital heart disease (CHD) incur neurological deficits which can be linked to decreased cerebral perfusion. Isometric handgrip exercise (IHG) has been shown to increase indices of cerebral perfusion in healthy individuals; therefore, it may be a feasible exercise modality to increase cerebral perfusion in patients with CHD.

This study tested the hypothesis that IHG would increase middle cerebral artery blood velocity (MCAv) similarly in contralateral and ipsilateral hemispheres of patients with CHD and healthy, age- and sex-matched controls. Patients with CHD (n=9 (4F, 5M); age=12±4y) and healthy controls (n=9 (4F, 5M); age=12±4y) completed 4 rounds of 2 min of IHG performed at 30% maximum voluntary contraction with each round of IHG separated by 1 min of recovery. During IHG, MCAv increased similarly in control and CHD groups in both contralateral (control=11±5cm/s vs. CHD=13±5cm/s; p=0.378) and ipsilateral (control=13±7cm/s vs. CHD=13±4cm/s; p=0.927) hemispheres. The relative magnitude of MCAv increase during IHG was also similar between control and CHD groups in both contralateral (control=18±8% vs. CHD=17±4%; p=0.800) and ipsilateral (control=20±12% vs. CHD=17±9%; p=0.944) hemispheres. These preliminary findings indicate that IHG may be a useful exercise modality to increase cerebral perfusion. Whether this can potentially improve neurological function in patients with CHD requires investigation.

Outcomes of a 6-month physical activity program on the physical literacy of children with congenital heart disease

Matthew S. Chapelski, Leah J. Ferguson, Amanda Froehlich Chow, Charissa Pockett, Kristi D. Wright, Corey R. Tomczak, Marta C. Erlandson

Introduction: Physical activity engagement is beneficial to children with congenital heart disease's (CHD) health throughout their lifetime. Physical literacy development is one way to improve physical activity engagement; however, it may be impaired in children with CHD. Additionally, in Saskatchewan children with CHD may reside in rural areas away from physical literacy development opportunities. Therefore, we conducted a 6-month virtual physical activity intervention to improve their physical literacy.
Methods: Our pre-post study included 13 children with CHD in the intervention program, 5 CHD controls, and 12 age- and sex-matched typically developing peers (TDP). The intervention utilized live virtual physical activity sessions delivered over zoom led by a facilitator as well as pre-recorded videos to be completed on their own. To measure physical literacy, PLAYfun and PLAYself were used to measure motor competence and confidence respectively. Physical activity was measured using accelerometers and age-appropriate versions of the Physical Activity Questionnaire (PAQ). A 3x2 between-within factorial MANCOVA (3 groups and 2 time-points) measured the effectiveness of the intervention, while controlling for age, sex, height, weight, maturity, and PAQ score.
Results: At baseline children in the intervention group had lower object control and total motor competence compared to TDP. Children in the intervention improved their locomotor motor competence over the 6-months. Our TDP and CHD controls had no change over time. At follow-up both CHD groups had lower balance and total motor competence compared to TDP. No change was found in the children's perceptions of their physical literacy for any group.
Discussion: Children with CHD have impaired motor competence and the intervention was unable to mitigate this difference, except for locomotor competence in the intervention group. Adherence was low (54%), which likely impacted the interventions capacity to improve physical literacy.

Poster PRESENTATIONS
11:15 – 11:45 am
Category 3 – Undergraduate

Attenuation of Cardiovagal Baroreflex Gain Resetting During Isometric Handgrip Exercise in Patients with Fontan Circulation

Sarah Al-Mouaiad Al-Azem, M. Rafique Khan, Adam M. S. Luchkanych, Thomas J. Jurrissen, Stephanie Fusnik, Marta Erlandson, Kristi D. Wright, Charissa Pockett, T. Dylan Olver, Corey R. Tomczak,

Exercise intolerance is hallmark in patients with Fontan (FTN) circulation and may be attributed to low baroreflex sensitivity and thus, a low heart rate response for a given exercise intensity. Whether resetting of the cardiovagal baroreflex gain during exercise in FTN is attenuated remains unknown. Accordingly, we tested the hypothesis that the increase in heart rate from rest to exercise would be lower and cardiovagal baroreflex gain resetting attenuated in FTN. Twenty-three patients with FTN (F = 11, M = 12; 14(4) yrs; BMI = 20(6)) were age- and sex-matched to 20 healthy controls (CTL; F = 7, M = 13; 14(4) yrs; BMI = 20(4)) that performed 2-min of isometric handgrip (IHG) exercise at 30-40% maximal voluntary contraction after 2-min of rest. Heart rate (electrocardiogram) and blood pressure (finger cuff photoplethysmography) were measured throughout. Cardiovagal baroreflex gain was determined using the spontaneous sequence method at rest and during IHG exercise. Sequences of 3 or more successive increases or decreases in SBP and heart rate (R-R interval) using a lag of 0, 1, or 2 cardiac cycles when r > 0.7 were included. Comparisons were made using mixed-designs ANOVA or unpaired t-tests and the threshold for significance was set to $P < 0.05$. In FTN, 36(21) sequences/participant at rest and 35(12) sequences/participant during IHG exercise were analyzed. In CTL, 26(9) sequences/participant at rest and 39(13) sequences/participant during IHG exercise were analyzed. Resting heart rate (FTN = 76(13) vs CTL = 70(8) bpm, P = 0.2208) and SBP (FTN = 109(13) vs CTL = 106(14) mmHg, P = 0.7188) did not differ between groups. Despite similar delta SBP responses to IHG exercise (FTN = 5(6) vs. CTL = 8(8) mmHg, P = 0.2014), the delta heart rate was lower in FTN relative to CTL (3(5) vs 15(10) bpm, $P < 0.0001$). At rest, cardiovagal baroreflex gain was lower in FTN relative to CTL (14.0(9.8) vs 24.4(6.3) ms/mmHg, P = 0.0001). Further, the delta baroreflex gain was attenuated in FTN compared to CTL (-0.2±5 vs. -9±8 ms/mmHg, P = 0.0001). The cardiovagal baroreflex gain and heart rate responses were negatively correlated in FTN (r = -0.68, P = 0.0003). Attenuated resetting of the cardiovagal baroreflex gain during exercise contributes to a blunted exercise heart rate in FTN.

Comparing the Diagnostic Profile of Fetal Alcohol Spectrum Disorder in Southern Saskatchewan with Other Prairie Provinces

Samantha Bundus and Dr. Susan Petryk

Fetal Alcohol Spectrum Disorder (FASD) is a complex brain condition associated with prenatal alcohol exposure (PAE) affecting cognitive, neurological, social and interpersonal functions leading to lifelong disability. FASD is estimated to affect up to 4% of the Canadian population. The CanFASD database compiles data from multiple Canadian diagnostic centers and thus provides the most comprehensive profiles on individuals assessed for FASD in Canada. The present study compared the CanFASD demographic and assessment data for FASD in children ages of 6 to 18 years amongst the three Prairie Provinces, Saskatchewan (SK), Alberta (AB), and Manitoba (MB).

RESULTS: This study found some similarities but several important differences amongst Canadian Prairie Provinces diagnosing FASD. There was a higher likelihood (p-value<0.05) of receiving an FASD diagnosis in AB than in SK and MB. AB had the highest rate of individuals with all three sentinel facial features (SFF) and highest rates of neurodevelopmental impairment amongst the provinces. There are numerous challenges and nuances around diagnosing FASD, making it difficult to pinpoint the reasons for differences across the three provinces. The results may indicate differing referral patterns, intake criteria, definition of PAE, age at assessment and diagnostic team composition.

Weight stigma among healthcare professionals treating cystic fibrosis in North America: a cross-sectional survey study.

Taylor Dennison; Sarah Nutter; Nita Chauhan

Background

Weight stigma affects provider judgment and decision-making and leads to healthcare delay and avoidance. However, weight stigma among healthcare providers working with patients with cystic fibrosis (CF) has not yet been examined. There has been a strong focus on maintaining an ideal-range body-mass index in patients with CF, as this has been protective for maintaining lung function. Further, the advent of highly-effective cystic fibrosis transmembrane conductance regulator (CFTR) modulators has not only promoted pulmonary health outcomes, but also contributed to weight gain in patients. Thus, the aim of this study was to answer the question: to what extent do healthcare professionals hold weight stigma towards patients with CF, and what factors influence these attitudes?

Methods

An anonymous cross-sectional online survey was distributed from August-December 2023 to multidisciplinary healthcare workers across Canada and the United States who work with patients with CF. The survey contained validated measures assessing contact quality, weight controllability beliefs, blame towards people with obesity, and weight stigma towards patients. Correlational and regression-based analyses were conducted to assess the relationships between survey measures and weight stigma. Participants who did not complete the survey, or who submitted it with excessive missing data, were removed.

Results

Data was collected from 249 participants. 54 were removed due to non-completion, leaving 195 respondents. 127 (65%) of respondents were American, 65 (33%) were Canadian, and three (2%) did not specify. 80 respondents worked with adult patients (41%), 67 worked with pediatric patients (34%), and 48 with patients of all ages (25%). The majority of participants identified as female (n=155, 79%), and as White (n=164, 84%). The most common profession was dietician (n=68, 35%). Contact quality had a significant negative indirect effect on weight stigma towards patients, via blame (*b = -0.07, 95% CI: -0.13, -0.03*). Weight controllability beliefs had a significant positive indirect effect on weight stigma, via blame (*b = 0.25, 95% CI: 0.16, 0.36*). The direct effect of contact quality and weight controllability beliefs on weight stigma was not significant.

Conclusions

Our findings highlight the importance of contact quality and weight controllability beliefs on weight stigma towards CF patients with higher body weights. Such information is invaluable given that the now-routine inclusion of CFTR modulators has contributed to patient weight gain. Next steps include further characterization of the consequences of this stigma on provider behavior and patient experience, as well as investigating ways to mitigate perceived bias.

Bone Health in Newcomer Children Compared to Canadian-Born Children

Kirk, R., Chapelski, M., & Erlandson, M.

Introduction: Bone health is crucial during childhood, as this period is essential for achieving optimal peak bone mass, which can reduce the risk of osteoporosis and fractures later in life. While research exists on the determinants of bone health, suggesting newcomer children may be at risk of impaired skeletal development, little is known of the bone health of newcomer children. The purpose of this study was to evaluate if there were differences in bone between newcomer and Canadian-born children.

Methods: Our cross-sectional study recruited forty-five children (12 newcomers and 33 Canadian-born) from 5 to 11 years of age. Bone health was assessed using high-resolution peripheral quantitative computed tomography (HR-pQCT) to measure total bone area (Tt.Ar), cortical area (Ct.Ar), trabecular area (Tb.Ar), total volumetric bone mineral density (Tt.vBMD), cortical density (Ct.vBMD), cortical thickness (Ct.Th), trabecular density (Tb.vBMD), trabecular thickness (Tb.Th), trabecular bone volume fraction (Tb.BV/TV), trabecular number (Tb.N), and trabecular separation (Tb.Sp) at the distal radius and tibia. Anthropometric measures were recorded and physical activity (PA) was evaluated using the Childhood Physical Activity

Questionnaire. Multivariate analysis of covariance (MANCOVA) was used to assess differences in HR-pQCT bone outcomes between groups while controlling for age, sex, height, weight, and PA. Statistical significance was set at $p<0.05$.
Results: Newcomer children had significantly greater Ct.Ar ($p=0.02$), Ct.vBMD ($p=0.02$), and Ct.Th ($p=0.01$) at the distal tibia compared to their Canadian-born peers. No significant differences were observed at the radius between groups ($p>0.05$).
Conclusion: Contrary to previous literature, this pilot study did not find that newcomer children had impaired bone health. Instead, newcomer children demonstrated greater values for cortical bone at the distal tibia. Future research should explore the impact of refugee status, parental education, acculturation, healthcare access, and diet with a larger and more ethnically diverse sample to better understand the bone development of newcomer children.

Body Composition between Children with Congenital Heart Disease and Typically Developing Peers: A CHAMPS Cohort Study*

Aidan Doleman, Matthew Chapelski, Kristi Wright, Corey Tomczak, Marta Erlandson

Background: Congenital heart disease (CHD) is among the world's leading birth abnormalities. Despite improvements in treatment and a steady rise in survival rates, children with CHD face significant health challenges in both the short- and long-term including obesity and low bone strength. The purpose of this study was to evaluate the body composition of children with CHD compared to healthy age- and sex- matched typically developing peers.
Methods: Body composition of 68 children with CHD and age- and sex-matched typically developing peers (n=27 females) were assessed using full body dual energy x-ray absorptiometry (DXA). Body composition measurements (bone mineral content, areal bone mineral density, lean mass, fat mass and fat mass percentage) were assessed by multiple analysis of covariance (MANCOVA) with age, height, maturity, and physical activity included as covariates for fat and lean mass measures. To evaluate bone measures, a MANCOVA with age, height, weight, maturity, and physical activity were included as covariates.
Results: Males with CHD had lower bone mineral content as well as higher trunk fat mass, fat mass, trunk body fat percentage and total body fat percentage compared to typically developing peers ($p<0.05$). There were no differences between females with CHD and matched typically developing peers ($p>0.05$).
Discussion: Our study found males with CHD have worse body composition measures for bone and fat mass compared to typically developing peers. Self-reported physical activity was lower for children with CHD thus, males may need more support to attain better body composition outcomes.

Comparing Sex Differences in Somatic Growth and Aortic Root Growth in Children with Marfan Syndrome in Saskatchewan

Lorynn Labbie, Dr. Tim Bradley

Background: Marfan syndrome (MFS) is the most common heritable thoracic aortic disease and can progress to life-threatening aortic dissection without effective management and surveillance. A common aspect of MFS surveillance is the monitoring of growth parameters and aortic root dimension (AoRD). Males with MFS have more rapid somatic growth and are more likely to meet surgical indications based on AoRD growth sooner. The aim of this study was to compare sex differences in somatic growth and AoRD growth in children with MFS in Saskatchewan and to determine if AoRd-for-height can be used as a better predictor of disease severity than AoRd-for-age.
Methods: All children with MFS (N=18) followed at Jim Pattison Children's Hospital in Saskatchewan were included in this study. A retrospective chart review was conducted to collect clinical data including demographics, genetic mutation, family history, systemic score, cardiac and extracardiac diagnoses, surgical interventions, medications, clinic visit details, follow-up plans, and serial investigations. Serial data on height-for-age, weight-for-age, BMI-for-age, AoRD-for-age and AoRD-for-height were compared between males and females with MFS and normative data (using CDC and WHO calculators). Control AoRD values were calculated via the Boston Children's Hospital Heart Center calculator.
Results: Males with MFS were taller-for-age compared with females, and both were taller-for-age compared with normative data. Weight-for-age and BMI-for-age comparison showed no sex differences in MFS and when compared with normative data. AoRD-for-age comparison showed no sex differences in MFS, but both tended to be larger-for-age when compared with normative data. AoRD-for-height was similar in both males and females with MFS patients but tended to be larger-for-height when compared with normative data. Further statistical analysis is ongoing.
Conclusions: This data suggests children with MFS, particularly males tend to be taller-for-age, and have larger AoRD-for-age and AoRD-for-height compared with the general pediatric population. This pilot project is to be expanded within the Canadian Aortopathy and Connective Tissues Disorder (CAN-ACT) Registry to determine whether AoRD-for-height is a better sex-dependent determinant of AoRD growth in approximately 600 MFS patients from across Canada.

Health Outcome of Young Children Born to Antenatal COVID-19 Positive Mothers

Mahrukh Masood, Sabiha Sultan & Polya Ninova

The SARS-CoV-2 pandemic has had a profound impact on global health, with emerging evidence suggesting negative effects on children born to mothers who contracted COVID-19 during pregnancy. This study investigates the health outcomes of these children by focusing on emergency room (ER) visits and hospitalizations as early indicators of potential long-term health challenges. Frequent ER visits, especially for acute conditions, may predict worse health outcomes. Data from children under two years old were analyzed to assess ER visit frequency, hospitalization rates, and reasons for medical consultations.
Results indicated that 63% of children born to mothers infected in the third trimester visited the ER, compared to 36% from the first and second trimesters. Although not statistically significant, this trend suggests that maternal infection during the third trimester may have a more pronounced impact on children's health, particularly with respiratory issues, which accounted for 71% of ER visits. Hospitalization rates were highest in children born to mothers infected in the third trimester, with average length of stay highest in the third trimester as well. These findings emphasize the importance of further research on trimester-specific impacts of maternal COVID-19 infection to guide healthcare strategies and interventions for affected children. Furthermore, data on vertical transmission indicating the virulence of the virus can further help identify which cohort is at higher risk for adverse outcomes.

Poster PRESENTATIONS
3:15 – 3:45 pm
Category 4 – Residents

Assessing Caregiver Understanding of Fasting Guidelines for Pediatric Day Surgeries

Anulika Nwakaeze, Krissie Urmson

Background: Caregivers of pediatric patients are provided with preoperative fasting instructions prior to their child's surgery to reduce the risk of pulmonary aspiration during the induction of anesthesia. Previous research suggests that this information is poorly understood, leading to low rates of compliance. Minimal research on the communication of fasting guidelines has been conducted in the pediatric population and is an area that warrants further investigation. The primary objective of this study is to investigate caregiver understanding of fasting instructions for pediatric day surgeries. The potential significance of this research is to improve the communication of fasting guidelines and contribute to lower rates of surgical delays and cancellations due to fasting noncompliance.

Methodology: This project is a prospective cohort study assessing caregiver understanding of preoperative fasting instructions. We aimed to recruit at least 51 caregivers of pediatric patients scheduled for elective day surgery. Participants were asked to complete an online or paper survey in the post-operative waiting room pertaining to pediatric fasting guidelines. If the survey was not completed in the waiting room, caregivers were allowed up to 1 week following the pediatric procedure to complete the survey. The questionnaires asked caregivers about their understanding of fasting guidelines, whether they were followed, and suggestions for improvement. Descriptive statistics will be provided of the results.
Results/Findings: Preliminary findings suggest that caregivers are aware of pediatric fasting guidelines and most are knowledgeable in the rationale for preoperative fasting to reduce the risk of pulmonary aspiration on induction of anesthesia. Fasting guidelines were received from multiple sources, with the minority being provided by anesthesiologists. The majority of caregivers ensure that their child is fasted for over 8 hours for food, and an irritable child has been identified as the main reason for difficulty in following instructions.
Conclusions: We expect to find that caregivers are ensuring that pediatric patients are fasted for surgery but are fasting their children for longer than recommended guidelines, which contributes to anxiety and irritability in pediatric patients. The researchers intend to use the information gathered to create solutions that will improve the communication of current pediatric fasting guidelines, which will contribute to better patient outcomes and caregiver satisfaction.

Onco-Fertility Needs Assessment of Adolescent Young Adult Cancer Survivors in Saskatchewan, Canada

Huyen Vu; Sierra Leonard; Saima Alvi; Trustin Domes; Elke Mau; Laura Hopkins; Paul D'Alessandro

Background: Onco-fertility counselling for pediatric and adolescent/young adult (AYA) cancer patients is a standard of care, even with limited fertility preservation (FP) options or centralized resources. There is one fertility clinic Saskatchewan, serving 1.2 million people across 651,900 km^2. As part of initiatives to standardize counselling/FP referrals provincially for pediatric/AYA cancer patients, we aimed to capture pre-existing practice patterns by surveying a cohort of AYA cancer survivors followed in our tertiary pediatric hospital long-term follow-up clinic.
Objective: To describe the onco-fertility experiences of a cohort of AYA cancer survivors (aged 15-39 years at study, >5 years off-treatment for a childhood or AYA cancer.) Exploratory aim was to determine if distance from home residence to our centralized fertility clinic impacted rates of counselling or referral.
Methods: Eligible patients participated in a single cross-sectional study visit. Self-reported demographics, experiences, and perceived barriers were collected via survey. Clinical variables were collected via medical record. Descriptive statistics were reported. The impact of distance from home residence to centralized clinic will be calculated using postal code/geocoding software.
Results: Thirty-two participants completed surveys: age 21.2 y (15.1-35.8 y); 56% male; 44% female; 69% White; 31% Indigenous/First Nations/Metis; 3.6% LGBTQ2S. 48% of patients recalled onco-fertility discussions as part of their cancer care (29% of which occurred prior to treatment) and 28% recalled FP referral. 34% had discussions documented in medical record. Most frequent self-reported barriers to accessing FP options were: potential for extra procedures (53.8%); too sick at diagnosis (50%); procedure not available (46.1%); and cost (46.1%). Geocoding analysis for exploratory aim is ongoing.
Conclusions: Historic counselling/FP referral rates were low. Patients endorsed extra procedures, clinical status at diagnosis, cost, and lack of FP options (not distance/travel) as barriers. These data can serve as our baseline from which to measure practice changes after provincial onco-fertility algorithm implementation.

Analysis of the T-cell Receptor Excision Circles (TREC) and Kappa-Deleting Recombination-Excision Circles (KREC) Newborn Screening Protocol in Saskatchewan, Canada

Karan S. Purewal, Darryl Adamko, Gina Martin, Nick Antonishyn, Luis Murguia-Favela

Background:
Newborn screening for severe combined immunodeficiency (SCID) relies on T-cell receptor excision circles (TREC) as a biomarker for newly formed T cells[1]. This method, introduced in 2005, identifies SCID by detecting low or absent TREC levels, indicating T-cell lymphopenia[2,1]. Saskatchewan implemented SCID newborn screening in February 2022[2].
In Saskatchewan, a multiplex real-time PCR-based assay, amplifies and detects four targets: TREC, KREC, SMN1 exon 7 and RPP30, in a single PCR reaction. The cut-off values for TREC screening in Saskatchewan classify a result as normal when TREC values exceed 300 copies/10^6 cells, with a KREC crossing threshold (Ct) of less than 40. A borderline result is defined by TREC values between 100 and 300 copies/10^6 cells, requiring repeat testing in duplicate. The result is considered abnormal if TREC values fall below 100 copies/10^6 cells.
In addition to TREC-based SCID screening, Saskatchewan is the only province in Canada that has integrated Kappa-deleting recombination excision circles (KREC) screening into its newborn screening program. KREC is a biomarker of newly formed B cells and has been proposed as a screening tool for primary B-cell immunodeficiencies such as X-linked agammaglobulinemia[3,2]. However, KREC screening is still being validated and has shown a high false-positive rate[3]. A newborn with a KREC (Ct) greater than 40 is flagged as abnormal (low or undetectable) and requires repeat testing. If KREC (Ct) remains greater than 40 on repeat testing after three weeks of age, the result is confirmed as abnormal and reported as screen-positive.
Methods:
This study is a retrospective chart review of all newborns who screened positive for low TREC or KREC levels in Saskatchewan since February 2022. Ethics approval from the Research Ethics Board (REB) and Saskatchewan Health Authority (SHA) operational approval have been obtained. Newborn screening data will be obtained from the RRPL (Roy Romanow Provincial Laboratory) and charts will be accessed through Electronic Medical Records (EMR). Data collection will begin in the coming months.
Anticipated Benefits:
The results of this study will evaluate the incidence of SCID true and false positives and determine optimal cut-off values for TREC screening. The study will assess the clinical utility of KREC screening in identifying primary B-cell immunodeficiencies. Preliminary findings suggest that KREC screening may have facilitated an early diagnosis of an Autosomal Recessive Agammaglobulinemia (IGLL1 mutation) in Saskatchewan. Findings from this study may inform future modifications to national newborn screening protocols.

Variations of care with bronchiolitis associated apneas in infants: A retrospective study

Jacqueline Harvey, Tanya Holt, Gregory Hansen

Introduction: Bronchiolitis-associated apneas are a life-threatening complication that are observed more frequently in younger infants born premature. Although apneas associated with viral bronchiolitis are relatively common, at present there is no consensus on management. We hypothesized large variations in our clinical practice, explored factors related to our outcomes, and suggest areas to consider for standardizing care.
Methods: This study was a retrospective chart review of viral bronchiolitis in children less than 2 years old, admitted to the pediatric intensive care unit (PICU) between July 1st 2023 and June 30th 2024, with at least one reported pre-hospital apnea. Electronic chart reviews were completed and documented demographics, pre-PICU clinical metrics and PICU interventions including maximal respiratory support, caffeine use, and antibiotics. Descriptive statistics were used for demographic data, and difference of means or Fisher's exact test were used for further data analysis of PICU outcomes.

Results: A total of 48 charts met inclusion criteria and underwent review. Young age (mean 0.27 years), female (58%) and RSV infections (64.6%) were common presenting variables, with a history of prematurity in 33.3% (n = 16) of cases. CRP was not significantly different between infants with or without bacterial infections. There was significant variability in caffeine use, antibiotics, and respiratory supports used. There were no deaths, and the average PICU stay was 3.9 days.
Conclusion: Our study documented wide variability in the clinical management of patients with bronchiolitis-associated apneas. Discussions around standardized care may include the initial modality for respiratory support, completion of a partial septic workup, biomarkers for bacterial infections, antimicrobial initiation, and the role of short duration caffeine.

Physician Well-being: Apply Your Own Oxygen Mask First

Jessyca Brissaw, Julie Le, Shuaa Basalom, Nita Chauhan, Rachel V. Silverberg, Tova Dybvig, Jagmeet Bajwa

Burnout, the intersect of emotional exhaustion, depersonalization and inefficiency (West, 2018), is an important marker of physician well-being with negative personal, financial, and patient care consequences. Since the beginning of the COVID-19 pandemic, studies found significant increases burgeoning on crisis. Our study establishes a baseline for the comparison of burnout and well-being scores. By better understanding the climate of burnout in our province, targeted interventions can be developed at a personal and institutional level.
We invited Saskatchewan physicians via departmental email lists to participate in a virtual survey. Exclusion criteria were non-practicing physicians, medical students, and residents. The survey involved demographics and the validated Physician Well-Being Index-Expanded (ePWBI) questionnaire, developed by Mayo Clinic. The ePWBI measures burnout, depression, suicidal ideation, fatigue, overall quality of life, and career-related outcomes (intent to reduce work hours, intent to leave medical practice).
Of the 129 participants, the majority were between the ages of 33-55 (N=73, 58.9%). The survey uptake skewed female (N=69, 53.4%), with 17 participants not disclosing their gender. Most participants were medical specialists (MS, N=93, 75%) or general practitioners (GP, N=29, 23.4%). Two responses were submitted by surgical specialists (1.6%), and four did not respond to this demographic (3.1%). Most participants work in an urban setting (N=112, 86%) and there was a balanced distribution of numbers of years in practice (ranging from <5 years to >30 years).
Analysis of ePBWI scores identified most participants as “at risk” (N=77, 62%). We investigated potential relationships between ePBWI risk score and the aforementioned demographic characteristics. Crosstabulations were performed to determine relationship between demographic characteristics and ePBWI risk score. An alarming 80% of GPs and the statistically significant majority of MSs were found to be at risk (N=24, 80% and N=52, 57%, respectively, $P<0.05$). There were no significant relationships between risk score and other demographics collected.

Poster PRESENTATIONS
3:15 – 3:45 pm
Category 6 – Residents
Non-Judged

Provider Perceptions of Changes in Self-Image in Adolescent and Young Adult (AYA) Oncology Patients

Devon Christoffel, Paul D’Alessandro

Gram Positive Cocci Infections in Canadian Pediatric Hospitalized Patients

Devynn McKenzie, Rupeena Purewal, Shauna Richards Athena McConnell

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Accidental Methadone Toxicity in a 3-year-old: A Case Report

Jessie Pappin, Gregory Hansen, Tanya Holt

Reducing Hospital Admissions for Croup Through Implementing a Guideline-Driven Orderset

Julia Zdybal, Selvy Kumaran, Grazyna Burek and Sey Shwetz

Scedosporium in a Pediatric Patient with Primary Ciliary Dyskinesia

Kara Place, Nita Chauhan, Rupeena Purewal

Reducing the Risk of ATV-related Harm in Saskatchewan Children

Heather Oland, Tyler Wenzel

Invasive Late Onset Group B Streptococcus Infection

Olivia Boden, Rupeena Purewal, Patrick Seitzinger, Shaun K. Morris

Persistent hyperbilirubinemia in a 1-week-old male

Sarah White, Sarah Tehseen, Karen S Leis, Morgan J Hewitt, Daphne Yau

Thank you

Our Presenters

Our Judges

The Department of Pediatrics, Research Office

The College of Medicine, University of Saskatchewan

The Jim Pattison Children's Hospital Foundation of Saskatchewan

SPRING (Saskatchewan Pediatric Research and Innovation Group)

For comments, suggestions, or more information on child health research at USask, please contact Tova Dybvig, Pediatric Research Facilitator, tova.dybvig@usask.ca or Oluwafemi Oluwole, Pediatric Resident Research Coordinator, at oluwafemi.oluwole@usask.ca

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