Department of Pediatrics
University of Saskatchewan
Presents

2024 Child Health Research Trainee Day

Thursday April 18, 2024
12:00 pm - 4:00 pm

UNIVERSITY OF SASKATCHEWAN
College of Medicine
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SASKKIDS PEDIATRICS

JIM PATTISON CHILDREN'S HOSPITAL FOUNDATION

spring
SASKATCHEWAN PEDIATRIC RESEARCH AND INNOVATION GROUP

Child Health Research Trainee Day
Thursday, April 18, 2024
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. Terry Klassen** (Keynote Speaker) *Pediatric Emergency Medicine: The Journey from single center study to international knowledge mobilization*

1:30 - 3:00 pm Long Presentations

Dr. Alyssa Zucchet (Resident - Pediatrics)
Dr. Danielle Olmstead (Resident – Pediatrics)
Sahanna Ramamoorthy (PhD- Community Health and Epidemiology)
Kristina Sobolewski (PhD-Kinesiology)
Matthew Chapelski (PhD- Kinesiology)
Rafique Khan (PhD-Kinesiology)
Ali Rezaei (PhD-Kinesiology)
Natalia Alaniz Salinas (PhD-Community Health and Epidemiology)

3:00 – 3:30 pm Poster Presentations (Graduate)

Nahin Shakurun (MSc- Community Health and Epidemiology)
Zahra Ghafouri (PhD - Kinesiology)
Craig Eling (PhD-Medicine)

3:00 – 3:30 pm Poster Presentations (Residents)

Dr. Meghan Gallagher (Resident -Pediatrics)
Dr. Piranavi Jeyagaran (Resident – Pediatrics)
Drs. Magdelena Koziak & Piranavi Jeyagaran (Resident - Pediatrics)
Dr. Cailey Turner (Resident – Pediatrics)
Dr. Madeline Parker (Resident – Pediatrics)

3:00 - 3:30 pm Poster Presentations (Outside of Medicine)

Breanna Morrison (Undergrad-Pharmacy)
Khoi Tran (Undergrad-Psychology)
Makayla Robinson (Undergrad – Engineering)
Lyuba Patushenko (Undergrad – Medicine)
Indiana Best (Undergrad- Medicine)

3:00-3:30 pm Poster Presentations (Postgraduate)

Jae Newton (Undergrad-Medicine)
Jaira Cross Childs (Undergrad-Kinesiology)
Alishba Muzaffar (Undergrad – Psychology)
Monica Ouellet (Undergrad- Medicine)
Taylor Dennison (Undergrad – Medicine)

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

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Dr. Terry Klassen

Presents

Pediatric Emergency Medicine: The Journey from single center study to international knowledge mobilization

Dr. Terry Klassen is a Pediatric Emergency Physician and Clinician Scientist. He is focused on the design and conduct of randomized controlled trials and systematic reviews to improve the outcomes of acutely ill and injured children presenting to the emergency department. He is working to improve the methods and conduct of research in this area. For this work he has been selected to join National Academy of Medicine (US) and Canadian Academy of Health Science (Canada). He has held major academic leadership roles across Canada, including Professor and Chair at Department of Pediatrics, University of Alberta and Stollery Children's Hospital (1999 to 2009). Most recently he was CEO and Scientific Director of Children's Hospital Research Institute of Manitoba (2010 to 2024) and Head, Department of Pediatrics and Child Health, University of Manitoba (2014 to 2019). He assumed the role as Provincial Department Head of Pediatrics, USask and SHA on April 1, 2024.

Long PRESENTATIONS
1:30 - 3:00 pm

Reducing the risk of all-terrain vehicle (ATV)-related harm in Saskatchewan children: A retrospective chart review of patients presenting to hospital from 2016-2021

Alyssa Zucchet, Tyler J. Wenzel

Background: All-terrain vehicles (ATVs) are a leading cause of serious injury in children. Certain Canadian regions have implemented legislation to promote safety, including age restrictions, mandatory training and helmet use. For example, Saskatchewan law restricts the use of ATVs by children aged 12-16 and bans the use of ATVs by children under the age of 12 on public land. Despite this, many children enter Saskatchewan hospitals for ATV-related injuries, and there is no province-specific data on these injuries.

Objectives: To estimate the burden of ATV-related injuries in children under the age of 20 in Saskatchewan, Canada in order to identify where social and legislative advocacy projects should be directed to reduce harm.

Methods: A retrospective chart analysis of the 354 children presenting to a hospital in Saskatoon, Saskatchewan for ATV-related injuries between 2016-2021.

Results: Accidents most commonly occurred in male children (69.77%) aged 12-16 (44.9%), riding a quad (as opposed to a dirt bike or other ATV) (36.44%) in the summer months (50.84%). Fractures were the most common injury (49.72%), though a number of moderate/severe head injuries (5.93%) and polytrauma cases (5.65%) were documented. The type of injury was significantly associated with the patient's health region of residence, with Saskatoon children accounting for the highest proportion of fractures (46.59%), mild head injuries (71.43%), and soft tissue injuries (62.11%), while children from the North and Far North Saskatchewan accounted for the highest proportion of moderate/severe head injuries (76.19%) and polytraumas (50%). Interestingly, while dirt bikes accounted for 26.8% of incidents and quads accounted for 36.4%, accidents involving quads resulted in an average hospital stay of 10 days, compared to 2 days for cases involving dirt bikes. This is likely because rollovers occurred more frequently on quads (49%) than dirt bikes (1%), resulting in more severe injuries (14% moderate/severe head injuries and polytraumas with quad use compared to 2% with dirt bikes). There was also a significant association between the use of helmets and the type of ATV ridden. 91.2% of children using dirt bikes were wearing a helmet compared to 48.3% of children using four-wheeled ATVs (quads, side-by-sides, and other ATVs), suggesting there may be a false perception of safety with regards to four-wheeled ATVs.

Conclusions: In collaboration with the Saskatchewan Prevention Institute, a non-profit organization working to prevent injuries in children, new public education initiatives are in development to address risks of ATVs and the importance of helmet use, based on these findings. We are hoping to also collaborate with the Saskatchewan ATV Association in advocating for ATV training for all drivers. There is a complex landscape of stakeholders, including rural municipalities and northern communities, and we have asked for a meeting with the Saskatchewan SGI minister to present our data, and specifically the inequity in injury severity present in the northern part of the province.

Evaluation of the critical sample in the investigation of pediatric hypoglycemia

Daphne Yau, **Danielle Olmstead**

Sustainable Development Goal 3 – Health & Wellbeing

Introduction: The differential diagnosis for pediatric hypoglycemia is broad, ranging from benign causes such as ketotic hypoglycemia to endocrine and metabolic disorders, requiring further investigations and ongoing management. The critical sample is a set of laboratory investigations collected at the time of hypoglycemia aiding in diagnosis and management. However, there are frequently delays between detection of hypoglycemia and collection of the critical sample such that investigations are collected when the patient is no longer hypoglycemic. This renders the results non-diagnostic or difficult to interpret. Furthermore, as the critical sample contains several investigations that are not performed routinely, there is often confusion regarding which tests to order and how to collect the sample. Our aim was to evaluate the timeliness and completeness of critical sample collection in pediatric inpatients at a tertiary centre.

Methods: Pediatric patients (<18 years) seen at JPCH for whom a critical sample was attempted or obtained between July 1, 2022 to February 1, 2023 were identified through a data pull from the Laboratory Information System (LIS). Results for glucose, cortisol, growth hormone, insulin and urine or serum ketones were extracted. Patients were excluded if investigations were obtained for reasons other than critical sample. Patient charts were reviewed to correlate POC glucose, time between hypoglycemia detection and collection of critical labs, use of PPO, or any obstacles to sample collection.

Results: 44 critical samples were identified with 41% of the samples (n=18) coming from NICU, 29.5% (n=13) from the ED and 20% (n=9) from PIPD. The average patient age was 1.96 years with 54.5% of the population being female (n=24). Of the 44 samples, 12 (27%) were complete, including glucose, ketones, cortisol, growth hormone and insulin. 31.8% of the samples utilized the pre-printed order set (n=14). 21 of the 44 samples (47.7%) were drawn while the patient was still hypoglycemic. Time between hypoglycemia detection and critical sample collection was widely variable with times ranging from 15 mins to 24 hours with a mean of 290 mins.

Conclusions: At this time, at our pediatric centre, critical samples are being utilized sub optimally, including incomplete critical samples, delays in obtaining labwork from the time of hypoglycemia detection, poor uptake of the PPO and correction of hypoglycemia prior to critical sample. Our next steps include involving multi-disciplinary leaders to identify barriers to obtaining critical samples and implementing sustainable changes to improve our critical sample draws and interpretation, thereby improving patient care.

In Tandem or Apart? Exploring self-reported and parental perceptions regarding children and adolescents' mental health changes and support needs during the COVID-19 pandemic

Sahana Ramamoorthy, Nazeem Muhajarine

Amidst the wealth of research exploring the COVID-19 pandemic's impact on children and adolescents' mental well-being, this study ventured further to investigate whether children and their parents share similar perceptions of these changes. Using data from 510 child-parent pairs, the study examined the alignment between self-reported mental health changes and support needs among children and adolescents aged 8-18 and their parents' reporting, during the pandemic and the factors that are associated with child-parent agreement. The findings reveal low levels of agreement among child-parent pairs regarding pandemic-induced mental health changes and support needs, with Kappa values of 0.4 and 0.2, respectively. While most children and adolescents reported a decline in mental health, only 62% of parents concurred. One in four expressed a need for support, contrasting with only one in eight parents echoing this sentiment. Factors such as children and adolescents' pre-pandemic mental health status, online schooling experience, and changes in physical activity levels positively correlated with child-parent agreement on pandemic-induced mental health changes. Household income had varying effects on agreement based on ethnicity; minority children showed decreased odds of agreement at lower income levels but increased odds at higher income levels, while White children displayed consistent likelihood of agreement across income levels. Lower odds of child-parent agreement on support needs were identified among children and adolescents with emotional dysregulation and inadequate sleep. Higher odds of agreement were noted among those with immigrant parents. Navigating the post-pandemic landscape requires tackling lingering and evolving mental health challenges among children and adolescents through innovative, adaptable, and equitable interventions, while fostering open communication between children and their parents.

Exploring Experiences of Children and Youth in Physical Activity Interventions in the School Setting: A Scoping Review

Kristina Sobolewski, Dr. Marta Erlandson.

Introduction:

Only about 28% 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 combat declining PA rates in this demographic, schools have been called upon to promote various PA opportunities.

One strategy to increase PA during school time is implementing classroom-based PA opportunities (e.g., movement breaks) during instructional time. Previous school-based PA interventions have used a 'top-down' approach where researchers and external collaborators develop the intervention protocol with limited input from administrators, teachers, and students which can lead to poor and short-term implementation. There is also scarce literature featuring children and youths' voices in school-based PA interventions in North America.
Purpose:
The purpose of this scoping review was to investigate the experiences of children and youth ages five to 14 in PA interventions in the elementary school setting.
Methods:
Arksey and O'Malley's (2005) methodological framework with recent enhancements was utilized and four databases (ERIC, MEDLINE, Public Health Database, and SPORTDiscus) were used to identify relevant studies published between January 2010 and January 2023.
Results:
From a total of 2,821 articles, five were deemed eligible. PA interventions consisted of policy programs (e.g. daily physical activity; DPA), Energizers, POWER activity breaks, active video game (AVG) program, and exergaming sessions. Child and youth experiences were captured using questionnaires and surveys as well as focus group interviews. Six themes were generated: (i) enjoyment, (ii) positive student views, (iii) enhanced attention, (iv) improvement in psychological health, (v) positive behaviour changes, and (vi) social support.
Conclusion:
Overall, children and youth positively view and enjoy physical activities in the classroom. Future work is warranted on the development of PA interventions based on the perspectives from children and youth as well as the method of collecting experiences from this demographic using comprehensive and creative approaches as opposed to singular quantitative methods.

Children with Congenital Heart Disease and the Canadian 24-hour Movement Guidelines: A Scoping Review

Matthew S. Chapelski, Megan Tomyn, Susan Bolton, Kristina Sobolewski, Amanda Froelich Chow, Corey R. Tomzcak, Leah J. Ferguson, Marta C. Erlandson.

Sustainable Development Goal 3 – Good Health & Well-Being
Sustainable Development Goal 10 – Reduced Inequalities

Background: Physical activity (PA) is essential for the short- and long-term health of children with congenital heart disease (CHD). However, other factors like sedentary time (ST), screen time, and sleep affect their holistic health. Despite this, their proximity to reaching the Canadian 24-hour movement guidelines for PA, ST, screen time, and sleep is not well known.
Methods: This review sought to synthesize evidence for PA, ST, and sleep behaviour of children with CHD and compare it to the Canadian 24-hour movement guidelines.
Sources of Evidence: Six online databases were searched for research published from 2010 to 2022. Eligible articles were included on children 4 to 20 years of age with any type of CHD lesion as well as at least a measure of one of PA, ST, screen time, or sleep.
Results: The search resulted in 8,281 articles and after removing ineligible articles, 27 were identified for this review. Of the included articles, twenty-six measured moderate-to-vigorous PA, eight measured light PA, twelve measured ST, two measured screen time, and three measured sleep time.
Conclusions: Children with CHD may be close to attaining the moderate-to-vigorous PA Canadian 24-hour movement guidelines and are likely attaining the guidelines for light PA. The differences in how PA are evaluated cautions an exact comparison to the guidelines. No comparison could be made for ST because it has no recommendation in the Canadian 24-hour movement guidelines. Future research should include evaluations of children with CHD's screen and sleep time.

Effect of acute isometric handgrip exercise on vascular function in children and emerging adults with congenital heart disease

M. Rafique Khan, Natasha G. Boyes, Adam M. S. Luchkanych, Ibrahim Al-Mouaiad Al-Azem, Thomas J. Jurrissen, Marta Erlandson, Kristi D. Wright, Charissa Pockett, T. Dylan Olver, and Corey R. Tomczak

Sustainable Development Goal 3 – Good Health & Well-Being

Endothelial dysfunction is common in congenital heart disease (CHD). Isometric handgrip (IHG) exercise may improve endothelial function; however, whether this applies to patients with CHD is unknown. We investigated brachial artery flow-mediated dilation (FMD) pre- and post- acute IHG exercise using duplex ultrasound in CHD and healthy controls (CTL; n=19 (7 F) vs. 21 (9 F), age: 13±4 vs. 13±4 y). Whereas IHG improved mean FMD in controls, it had no effect on the mean FMD response in patients with CHD. Subsequently, participants within each group were categorized based on ΔFMD response (post-pre IHG FMD), in which those that experienced a decrease were classified as non-responders (NRESP) and those that experienced an increase were classified as responders (RESP). Among NRESP, ΔFMD was lower in CHD vs. controls (p=0.0224). Among RESP, ΔFMD was lower in CHD vs. controls (p=0.0543). Data during pre-occlusion in NRESP from pre- to post-IHG exercise showed improved antegrade shear rate (condition effect, p=0.0078), retrograde shear rate (interaction effect, p=0.0410), and oscillatory shear index (interaction effect, p=0.049) in CHD compared to controls. Potentially, IHG exercise enhanced vascular sensitivity to shear, resulting in an increase in baseline diameter and reduced FMD in CHD NRESP. Thus, reduced FMD after acute IHG exercise is influenced by improvements in resting shear rate parameters in patients with CHD.

Site-specific differences in bone area, density, and micro-architecture between monozygotic twins discordant for type 1 diabetes: a case-control study

Ali Rezaei, Munier Nour, James Johnston, Saija Kontulainen

Sustainable Development Goal 3 – Good Health & Well-Being

Introduction: Introduction: Type 1 Diabetes (T1D) is known to have detrimental effects on bone, however, confounding factors such as genetics, environmental exposures and lifestyle differences influence bone development. Twin studies offer the ability to control for genetic influences on bone development, however, are extremely difficult to perform in T1D given the high concordance of developing T1D in monozygotic twins..
Objective: This study aimed to describe and compare the bone area, bone mineral density, and microarchitecture of a twin pair discordant for T1D.
Design and Methods: We report a case-control study on a pair of monozygotic twins, obtaining data through High-Resolution peripheral Quantitative Computed Tomography. We calculated Z-scores for each bone outcome using reference data and described differences between the twin with T1D and control twin (without T1D).
Results:
The twins, both male, were 12.1 years old, with the twin with T1D measured 142 cm and having a BMI of 16.6, while the control twin measured 146.6 cm with a BMI of 17. PAQ-C scores showed slight difference in physical activity level (T1D = 3.1, TD = 2.7). Dietary analysis revealed differences in protein (T1D = 46.5 g, TD = 34.8 g), vitamin D (T1D = 109.6 IU, TD = 33.9 IU), and calcium (T1D = 533.3 mg, sibling = 226.7 mg) intake. The twin with T1D had diabetes for 5.9 years and an HbA1c level of 9.1%. He had lower radius total area than the control, as well as relative to the mean of the reference population (Z-score = -1.77 for T1D and -0.28 for TD, respectively), while tibia total area was comparable between the twins (Z-score = -1.67 for T1D and -1.31 for TD, respectively). Although the twin with T1D had a higher tibia trabecular number compared to his sibling (Z-score = -0.58 for T1D and -1.77 for TD, respectively), his tibia trabecular thickness was markedly lower (Z-score = -0.85 and Z-score = 0.17). Additionally, we observed relatively lower tibia cortical porosity (Z-score = 0.87 for T1D and 2.35 for TD, respectively), along with higher radius cortical bone mineral density in the twin with T1D (Z-score = 4.57 for T1D and 3.01 for TD, respectively).
Conclusions: The findings suggested site-specific effects of T1D on bone area, density, and micro-architecture, characterized by lower total area and higher total and cortical mineral density in the radius, as well as higher trabecular number and lower trabecular thickness and cortical porosity in the tibia.

The Whats and Whys of School Lunches: A mixed-methods study of the nutritional value of lunches eaten by elementary students during schooldays and their caregivers' attitudes and practices towards school lunches.

Natalia Alaniz-Salinas - Supervisor: Dr. Rachel Engler-Stringer

Sustainable Development Goal 2 – Zero Hunger

Introduction: School-age children spend a significant portion of their day at educational facilities, consuming meals such as lunch. Most children in Canada have poor-quality diets, especially during school day. The lack of universal national or provincial school food programs and policies in Canada limits the utility of dietary recommendations. Families most often provide lunch during the school day, with a minority of students accessing small-scale lunch programs. This research studied the nutritional value of school lunches of elementary students, explored their caregivers' attitudes and practices towards these lunches, and related these attitudes and practices with what children eat for lunch at school. Methods: Mixed-method research design. It starts with a descriptive quantitative component using plate waste methodology to assess nutritional contribution and nutrient density of lunches, followed by a naturalistic phase, involving interviews which explore caregivers' attitudes and practices regarding lunches. Lastly, it comprises triangulation of results. Results: Lunches' mean, and median energy contribution were 442.6 kcal (SD 209.6) and 413.5 kcal (IQR 287.6), 13.6% of which were proteins. There were statistically significant differences in calorie content across grades. Lunches' nutritional contribution fell below Canadian references for most critical nutrients for childhood, such as calcium and vitamin D. Mean NRF9.3 Index score for school lunches was 346.8, with statistically significant variations between grades. Parents reported that preparing school lunches was a stressful chore. Various factors affected them, such as nutrition, cost, portability, and time constraints. Caregivers aimed to include options their children would like to eat, ensuring they were going to be fed during school hours. Conclusion: Most school lunches have low contribution of critical nutrients for childhood and low nutrient density, which can be attributed to various circumstances within the families' and students' contexts. Public policies could play a crucial role in addressing this issue, such as a universal school lunch program.

Poster PRESENTATIONS
3:00 – 3:30 pm
Graduate Category

Mood states of children and youth in Saskatchewan in the second year of COVID-19 pandemic: Insights from See Us, Hear Us 2.0 study

Shakurun Nahin, Adeyinka Daniel Adedayo, Hinz Tamara, Muhajarine Nazeem

Background: During the 2021-2022 school year, the COVID-19 pandemic had posed unprecedented challenges and disruptions to the children and their families. The mental health and psychological wellbeing of children became a major concern amidst the pandemic. Research on how Saskatchewan children and youth fared in the 2021-2022 year is necessary to inform an ongoing response to child and youth mental health crisis. This study aimed to examine the current mood states and associated factors in children and youths in Saskatchewan two years into the pandemic.

Methods: We used data (N=563 dyads) from the "See Us, Hear Us (SUHU) 2.0," a cross-sectional study of Saskatchewan children aged 8-18 years and their parents/caregivers. Data were collected between May and July 2022. The dependent variable, current mood state, was a composite score measured by Coronavirus Health Impact Survey (CRISIS) scale. The independent variables identified from the literature include sociodemographics, behavioural factors, household conditions, and coping ability. Multiple linear regression modeling was conducted. Significant interaction and mediational effects were also identified. Data missingness were addressed through imputation and data were weighted to ensure sample representativeness.

Results: The participants reported eight negative mood symptoms ("moderate" to "extreme") according to the CRISIS scale ranging from 23-38%. Negative moods score was 0.37 units higher among children between the ages of 16 and 18 compared to those aged 8-11. Individuals who did not identify strictly as either boys or girls experienced more negative moods, with a difference of 1.26 units compared to boys. Mixed learning modalities (online and in-person) (β=0.21) disrupted extracurricular activities (β=0.17), and increased screen time (β=0.32) were significantly associated with worsen moods. The ethnic minority groups (BIPOC) living in mid-sized cities/towns were more likely to be associated with negative moods compared to Whites residing in cities (Saskatoon/Regina). Also, BIPOC children with Canadian-born parent experienced higher negative moods compared to White children. Moreover, coping ability significantly mediates the relationship between extracurricular activities and mood states in children and youth.

Public health implications: Our study recognizes eight different dimensions of mental health symptoms in children and youth. The findings from our study underscore the importance of proactive mental health support, tailored interventions for specific age groups, gender identities, ethnicities and addressing the adverse effects of the pandemic-related disruptions on mental and well-being of school children in Saskatchewan.

Thyroid stimulating hormone is negatively associated with cortical bone volume and micro-architecture in children with type 1 diabetes

Zahra Ghafouri, Munier Nour, Saija Kontulainen

Sustainable Development Goal 3: Good Health and Well-being

Introduction: Thyroid hormones are essential for bone growth and development. Childhood hypothyroidism may cause delayed skeletal development, retarded linear growth and impaired bone mineral accrual. Multiple imaging modalities have demonstrated altered bone development in children and youth with type 1 diabetes. It is unknown if variations in thyroid hormone metabolism are associated with bone micro-architectural, density and morphologic differences in children with T1D. Thus, we explored correlations between thyroid hormones and bone outcomes in children with T1D.

Methods: We obtained measures of thyroid stimulating hormone (TSH; mIU/L) and free thyroxine (fT4; pmol/L) from clinical health records of a total of 54 participants of the Bone Strength Development Study in children with T1D, (N= 22 male, median age = 12.4, SD = 2.2). High-Resolution peripheral Quantitative Computed Tomography (HR-pQCT) scans of the distal radius and tibia were obtained and evaluated using standard evaluation and advanced cortical analysis to quantify bone measures. We tested nonparametric partial correlation between thyroid hormones and bone outcomes of HR-pQCT after accounting for sex using IBM SPSS 27. Significance was set to $p < 0.05$.

Results: The correlation analysis in children with T1D between TSH and distal radius and tibia cortical total volume, cortical bone volume, cortical area, and apparent cortical thickness was negative $r(49) = -0.3$, $p = 0.03$. There was no significant correlation between fT4 and bone outcomes in either site.

Conclusions: The negative association between TSH and cortical bone volume, area, and thickness in the sample of children with T1D indicates that alterations in thyroid hormone metabolism may alter cortical bone segmental size outcomes. Further longitudinal research is needed to elucidate the clinical impact, underlying mechanisms and establish causality.

Identifying Facilitators of and Barriers to Digital Health Literacy in Pediatric Rheumatic Disease: The Development of a Scoping Review Protocol

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

Sustainable Development Goal 3 Good Health & Wellbeing

SDG 10 Reduce inequality within and among countries

Background

Digital health technologies can improve access to healthcare, enhance convenience and efficiency for both patients and providers, and empowerment individuals through tools that provide real-time health data and personalized feedback.

However, to effectively access, understand, and use these digital health tools and online health information to manage health, users must have a set of skills known as digital health literacy (DHL). Specific to pediatric rheumatic diseases (PRD), factors that improve or harm DHL are a knowledge gap. To address this, a scoping review (ScR) protocol was developed to allow for the collation and appraisal of the current knowledge around DHL in the PRD population.
Methods
The scoping review (ScR) protocol will apply the Joanna Briggs Institute (JBI) scoping review framework and the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) guidelines. The protocol will be limited to studies and dissertations that identify facilitators of and barriers to DHL in children and adolescents (aged 0-19 years) with PRD and/or their primary caregivers. Eligible studies will include English-language quantitative, qualitative, and mixed-methods research articles published since 1974 (the year the term *health literacy* was developed) from any healthcare field, without geographical restrictions. Grey literature, complementary and alternative medicine studies, and review articles will be excluded. Three independent researchers will screen titles and abstracts for inclusion, followed by a full-text review for data extraction. Descriptive statistics will be provided around the identified facilitators of and barriers to DHL, the populations studied, and other relevant data. Qualitative data will be open-coded and categorized around the research question and the findings will be presented in a narrative summary.
Discussion
This ScR protocol will establish a comprehensive framework for the examination of the intersection of technology, healthcare, and the unique challenges endured by those with PRD. The novel and comprehensive search strategy developed will enable researchers, healthcare providers, and policymakers to gain valuable insights that can guide future research and be used to design of more inclusive and accessible digital health solutions, ultimately promoting equity and improving the health-related outcomes of children, adolescents, and families affected by PRD**.**

Poster PRESENTATIONS
3:00 – 3:30 pm
Resident Category

Intermittent Pulse Oximetry Protocol in Bronchiolitis: A Quality Improvement Initiative

Meghan Gallagher; Ayisha Kurji; John Melville

Bronchiolitis is the most common reason for admission to hospital in children under one year of age.(1) Rising admissions for this have been costly to both the healthcare system and also to families.(2,3) Continuous pulse oximetry is typically used at the start of an admission to monitor the patient's clinical status, but prolonged usage without step-down to intermittent oxygen saturation monitoring has been shown to increase length of stay,(4) which in turn may increase the burden on the health care system and on families. In 2014 the American Academy of Pediatrics released its bronchiolitis guidelines which questioned the need for continuous pulse oximetry, and suggested that in certain patients, intermittent pulse oximetry would be sufficient. This quality improvement initiative took place on the pediatrics inpatient ward at the Jim Pattison Children's Hospital. It involved developing a protocol detailing oxygen support weaning guidelines for patients admitted with bronchiolitis, with the hope that when implemented safely, intermittent pulse oximetry may prove to be an important tool in shortening admission length. Data was collected on length of stay for patients admitted with bronchiolitis during the 2022-2023 and 2023-2024 winter seasons and demonstrated a decrease in length of stay from the 2021-2022 season (prior to initiation of this protocol). There was no increase in return visits to the emergency room at the Jim Pattison Children's Hospital after discharge, which was used as a safety indicator for this new protocol. This protocol currently remains in use, and work is ongoing to expand this protocol to support respiratory therapy-initiated weaning of high flow nasal canula support.

Navigating pCRPS Management - A Scoping Review

Adedeji Ologbenla, **Piranavi Jeyagaran,** Allen Finley, Krista Baerg, Susan Tupper, Stephanie Blackman, Darlene Chapman

Sustainable Development Goal 3: Good Health & Well-Being

Background and Aims:
Pediatric Complex Regional Pain Syndrome (pCRPS) is a chronic pain condition characterized by continuous pain that is out of proportion to the inciting trauma in the context of autonomic, motor, and trophic changes.[1,2] Though it is quite rare with a minimum Canadian incidence of 1.14/100 000 children,[3] outcomes are quite significant and hugely affect quality of life.[4] Although a multi-disciplinary approach is thought to be best for management, there is still a great degree of treatment variability.[3] Management variability highlights the need for consensus guidelines based on up-to-date evidence on the management of pCRPS.
We are conducting a scoping review to summarise and evaluate for the most effective ways of managing pCRPS and to identify gaps in the literature where future research should be undertaken. Based on this review, consensus guidelines can be formed in future.
Methods:
With the aid of a professional health sciences librarian, we searched for relevant articles from 1994 – February 2022 using MEDLINE, EMBASE, COCHRANE and CINAHL databases. We included 1) studies on patients 2-18 years old with pCRPS and its synonyms; 2) studies on pharmacological and non-pharmacological management of pCRPS; and 3) RCTs, cohort studies, case control studies, retrospective chart reviews and case series. We followed the scoping review guideline for the Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA-ScR).[5] We intend to report findings thematically: non-pharmacological, pharmacological management and outcomes of pCRPS. Descriptive statistics will be used where necessary to summarise findings e.g. distribution of studies, CRPS characteristics, interventions and outcomes.
Results:
Upon completion of abstract and full text screening in duplicate, we ended up with a total of thirty-two papers for data extraction. Thirteen of the papers (40.6%) were retrospective chart reviews while ten of the studies (31.2%) were case series. There were three (9.4%) longitudinal cohort studies and only two randomized trials (6.2%). 56.3% of the studies were from North America, 31.3% from Europe, 6.3% from Australia and 3.1% respectively from Japan and Uruguay**.** Thirteen of the studies (40.6%) were published over the last decade while the remaining nineteen (59.4%) were published prior to 2012. Twenty studies (62.5%) evaluated the use of a multimodal approach in the management of pCRPS while twelve studies (37.5%) assessed single interventions e.g., pharmacotherapy, physiotherapy, acupuncture, or intensive rehabilitation.
Conclusion:
Our preliminary results reveal a shortage of high-quality studies in the management of pCRPS with most studies being case series and retrospective chart reviews. Many of the studies from around the world employed some form of multimodal approach to pCRPS management. We hope to further.

Hemoglobin A1C Measurement via Dry Blood Spot in Youth At-Risk for Type 2 Diabetes in Saskatchewan

Magdalena Koziak, Piranavi Jeyagaran, Tova Dybvig, Linda Kessler, Tanya Conacher, Alicia Oliver, Reanna Chief, Ashley DeBusschere, Nail Imran, Daphne Yau.

Sustainable Development Goal 3: Good Health & Well-Being

Background: In the past decade, the incidence of type 2 diabetes has increased significantly – by 60% in youth overall with a 50% increase specifically in Indigenous youth (36.6 per 100,000 Indigenous youth per year). Recent studies have demonstrated the aggressiveness of youth-onset type 2 diabetes with a high risk of chronic complications. Given this, more effects on screening and prevention in high-risk populations have been proposed to help prevent progression to diagnosis and early identification to reduce future risks of complications from diabetes.

Methods: Our study looked at screening youth at risk for type 2 diabetes using a dried blood spot sample to measure hemoglobin A1C in grade 8 students from Onion Lake Cree Nation, Saskatchewan. The study involved a day of activities to promote awareness around type 2 diabetes as well as an opportunity to be screened for type 2 diabetes via dried blood spot testing. Participants who consented to screening also had height and weight measured, and completed a health survey. The latter addressed the presence of symptoms of diabetes as well as risk factors including family history and associated conditions (hypertension, dyslipidemia, non-alcoholic fatty liver disease, and acanthosis nigricans).
Results: Of 42 who consented, 23 students participated in the screening, and 5 (22%) tested positive for diabetes (A1C $\geq$ 6.5%) or pre-diabetes (A1C 6.0 – 6.4%). A positive family history was more common in those who screened positive (40% vs 11%). There was no difference in BMI Z-score (positive/pre-diabetes median +2.2, range -1.0 to 4.6; negative median +2.6, range -0.8 to 3.1), diabetes-associated symptoms between those who screened positive for diabetes or pre-diabetes vs negative, and similarly, no difference in associated conditions. The caveat is the self-reported nature of the health survey affecting the accuracy of these associations, particularly given the age of the participants.
Conclusion: High risk children may screen positive for diabetes or pre-diabetes and have no features on history or clinical exam that distinguishes them from those screening negative. These findings suggest that there may be a large population of at-risk youth who are going undetected until later in life or are not overtly symptomatic. This emphasizes a potential need for screening protocols for youth at risk for type 2 diabetes in Saskatchewan to prevent future complications of diabetes.

Use of Antibiotics for Community Acquired Pneumonia in an Inpatient Pediatric Ward

Cailey Turner, Ayisha Kurji, Rupesh Chawla, Justin Kosar

BACKGROUND: Uncomplicated community acquired pneumonia (CAP) is a common pediatric infection and remains a common cause of hospital admission. Current guidelines recommend using Amoxicillin or Ampicillin as first line treatment for this infection. However, our team recognized that often broad-spectrum Ceftriaxone was used as a first line treatment for children admitted to the pediatric inpatient ward with CAP. The goal of this quality improvement study was to reduce broad spectrum antibiotic use in the treatment of uncomplicated CAP.
METHODS: Data was collected from the pediatric inpatient ward from 2017-2018 during the respiratory season to determine the frequency of each antibiotic use for the treatment of CAP. A pre-printed order (PPO) set and algorithm on Firstline app were created to provide guidance to practitioners on antibiotic choice for treatment of CAP. Following implementation data was collected from 2022-2023 during the respiratory season to determine if there was improved use of Amoxicillin and Ampicillin for treatment of uncomplicated CAP and decreased broad-spectrum Ceftriaxone use.
RESULTS: Prior to implementation of the PPO and the CAP Firstline algorithm the pediatric ward was using Amoxicillin/Ampicillin 34% of the time for treatment of uncomplicated CAP and Ceftriaxone 34% of the time. Following implementation of the PPO set and the Firstline algorithm the rate of Amoxicillin/Ampicillin increased to 54% and Ceftriaxone use decreased to 23%. Unfortunately, the PPO set was not used, however the CAP algorithm was the number one Firstline algorithm used for the entire province of Saskatchewan.
DISCUSSION: The simple implementation of the Firstline algorithm for CAP resulted in decreased use of Ceftriaxone and increased use Amoxicillin/Ampicillin. The implementation of the Firstline algorithm far succeeded the use of the PPO set. Therefore, we would recommend further use of the Firstline app for creating algorithms for treatment protocols for common pediatric infections to help improve antimicrobial stewardship.

Case Report: Treatment of hypoglycemia due to a rare pathogenic variant in AKT2 with waxy maize heat modified starch

Madeline Parker, Daphne Yau

The serine-threonine kinase AKT2 is a critical mediator of insulin's anabolic effects, particularly cellular glucose uptake. The gain-of-function c.49G>A, p.(Glu17Lys) AKT2 variant results in hypoketotic hypoglycemia with suppressed insulin and free fatty acid levels due to constitutive activation of the insulin signaling cascade. Although biochemical similarities exist among the eight individuals identified to date, the associated phenotype varies considerably. Treatment of these patients remains challenging, consisting primarily of frequent feeds with uncooked cornstarch. We describe a female with hemihypertrophy, developmental delay, and dysmorphic features who presented to our center with hypoglycemic seizures at age 6 months. Critical sample revealed hypoketotic hypoglycemia, undetectable insulin, and suppressed free fatty acids. Molecular testing confirmed a pathogenic c.49G>A, p.(Glu17Lys) AKT2 mutation. Glycemic control was initially difficult to establish, with recurrent hypoglycemia despite high glucose infusion rates. Following in-hospital administration of waxy maize heat-modified starch at age 4-years, she remained euglycemic overnight, despite a previous report showing no benefit compared to uncooked cornstarch in an infant with the same mutation. Our report suggests waxy maize heat-modified starch is a viable treatment option for patients with activating c.49G>A AKT2 mutations and provides further evidence of a broad phenotypic spectrum.

Poster PRESENTATIONS
3:00 – 3:30 pm
Undergraduate Category 1

Adverse Effects Coinciding with Amatandine Use in Pediatric Patients for Pscyiatric Indications: A retrospective Case Series

Morrison, Breanna; Almas, Laura; Clarke, Ashley; Dalton, Courtney; Parkinson, Patrick; Tang, Andrea; Halpape, Katelyn

Background: Current pharmacotherapy may be ineffective in controlling behavioural disorders such as attention-deficit/ hyperactive disorder (ADHD), autism spectrum disorder (ASD), obsessive-compulsive disorder (OCD), and oppositional defiant disorder (ODD) in some pediatric patients. Despite limited available evidence, amantadine is used off-label as an adjunctive therapy for pediatric psychiatric conditions.
Objective: To identify and describe the pediatric patients admitted to the Royal University Hospital campus who experienced amantadine-related adverse effects when it was used for psychiatric indications over a 15-year period.
Methods: Cases were identified by screening through the inpatient pharmacy and clinical care software to identify patients 17 years or younger with amantadine orders between January 2007 and December 2022 who experienced adverse effects that may be related to amantadine. One case was identified through routine pharmacist patient care activities. Cases were excluded if clinical presentation did not match a pre-defined list of known amantadine adverse drug effects. Data was analyzed using descriptive statistics.
Results: Twenty patients were identified that fit the study inclusion criteria. There were a range of physical and psychiatric adverse effects noted that coincide with known amantadine adverse effects. However, several confounding factors (e.g. co-morbid conditions, concurrent medications) and limitations (e.g. retrospective design) were present. The most frequently observed adverse effect was aggression in 16 (80%) patients.
Conclusion: This study highlights potential safety concerns regarding the use of amantadine in pediatric patients. Given the limited evidence for amantadine use in pediatric psychiatric patients and the adverse effects seen in this real-world study, amantadine should be used cautiously. More rigorous, studies should be performed to draw conclusions regarding amantadine use, dosing, and safety in this patient population.

Examining The Joint Effects of Malnutrition and Early-Life Stress on the Behavioral and Physical Development of Wistar Rats

Khoi Tran, Wendie Marks, Afzal Javed

Sustainable Development Goal 3: Good Health & Well-Being

Malnutrition and early life stress can independently cause adverse neurodevelopmental and physiological effects, but it is unclear whether these factors work in an additive or synergistic manner. This study aimed to fill this gap in knowledge by examining the joint effects of malnutrition and early life stress on physical and behavioral development in a Wistar rat model. We subjected female Wistar rats and their offspring (*N*=24 litters) to 4 conditions: (1) control conditions, (2) protein-restricted diet, (3) maternal separation stress, and (4) simultaneous exposure to a protein-restricted diet and maternal separation stress. Physical development was assessed by tracking developmental milestones such as body weights, eye opening, ear opening, and fur development, as well as performance on physical tests such as the righting reflex, negative geotaxis, and grip strength in male and female pups. Behavioral development was assessed through ultrasonic vocalizations (USVs) and the open field test in pups. Mixed factorial ANOVAs revealed that protein-deficient pups consistently weigh significantly less than control pups. Maternally separated pups had significantly delayed ear opening, performed worse on measures of grip strength, and emitted significantly fewer USVs than control pups, suggesting impaired communication. Pups on control conditions or exposed to the cross-interaction of diet and stress had significantly earlier eye opening than either protein-restricted pups or maternally separated pups. The majority of evidence did not suggest an additive or synergistic effect of the simultaneous exposure to a protein-deficient diet and maternal separation stress on other variables. Overall, these findings underscore the importance of both diet and stress in ensuring healthy physical, behavioral, and social development of rat offspring.

Does Finite Element Modeling Simulating a Fall on the Outstretched Hand Differentiate Children with and without Type 1 Diabetes?

Makayla Robinson, Yuwen Zheng, Munier Nour, Saija Kontulainen, J.D. Johnston

Sustainable Development Goal 3: Good Health & Well-Being

Children with type-1 diabetes (T1D) appear to be more prone to fractures than typically developing children (TDC). Finite element (FE) modeling is a technique which can estimate structural properties of bone, such as the failure load of the fracture-prone distal radius. Such a tool could help identify children with T1D susceptible to fractures, which is important for preventative treatment (e.g., pharmacology, exercise). Prior FE modeling research comparing children with T1D to TDC have had conflicting results. This may be due to simplified FE modeling approaches, notably that prior research applied a single elastic modulus (E) for bone, which ignored heterogeneous material properties, and simulated pure compressive loading, which ignored the effects of bending associated with a fall onto the outstretched arm. Using a novel FE modeling approach which accounts for varying material properties and simulates a fall onto the outstretched hand, the objective of this study was to compare structural properties of the distal radius (stiffness, failure load) of children with T1D to TDC. Participants (54 TDC; 44 T1D) aged 6-17yrs were matched in terms of sex and maturation status. FE models were developed from high resolution peripheral quantitative computed tomography (HR-pQCT) imaging data. Material properties were assigned via an experimentally derived density-modulus relationship linking varying HR-pQCT imaged bone mineral density (BMD) to E. A loading scenario simulating a fall onto the outstretched hand was modeled. Failure load was determined when 0.3% of elements reached critical strain limits (tension: 7000mstrain; compression: 10000mstrain). Non-parametric Mann-Whitney tests were used to compare structural properties between TDC and children with T1D. Results indicated no difference between groups for axial, shear, bending, or torsional stiffness or for failure load (p-value >0.05 for all tests). These results indicate that FE modeling does not differentiate children with and without T1D. This lack of differentiation could be due to alterations in bone material properties (as reported in animal studies of diabetic bone). However, these potential alterations are unaccounted for in current HR-pQCT-based FE models and could contribute to bone fragility in children with T1D. These limitations need to be addressed in future research.

A Retrospective Review of Children with Genetically Acquired Aortopathy in Saskatchewan

Lyuba Pastushenko, Tim Bradley

Background: Genetically acquired aortopathy is often undiagnosed and may present with life-threatening aortic dissection. Long-term survival depends on early diagnosis, expert medical management, and elective aortic surgery. The aim of this study was to identify all children being followed in Saskatchewan with genetically acquired aortopathy and describe their genotype and clinical phenotype.

Methods: We conducted a retrospective chart review of all children with genetically acquired aortopathy followed in Saskatchewan collecting data on genotype, clinical presentation, medical and surgical management, and rate of aortic growth.

Results: Of 18 children included (mean age 12.6±5.6 years, 13 males), 17 had Marfan syndrome and 1 had Loeys-Dietz syndrome. Medical management included angiotensin receptor blockers, beta-blockers, or a combination of both in 13 children and elective valve sparing aortic root replacement was required in 3 children. Annual growth of aortic root dimension and initial aortic root z-score for body surface area were higher in the children who required surgery or were approaching surgical indication.

Conclusions: To date, this is a descriptive study pending further analysis. This data will be submitted to the Canadian Aortopathy and Connective Tissues Disorder (Can-ACT) Registry, which aims to develop national management guidelines and improve care for all children with genetically acquired aortopathy across Canada.

Clinical Audit: Clinical Practices in the Management of UTI in preterm infants

Indiana Best, Dr. Rupeena Purewall, Dr. Asma Nosherwan

Introduction: Given that 30% of late onset sepsis in preterm infants is due to Urinary Tract Infection (UTI), UTI's need to be routinely ruled out during septic workup in the Neonatal Intensive Care Unit (NICU). The reported prevalence of UTI is up to 13%. There is a noticeable paucity of guidance in the management at this age, with guidelines addressing those >2 months. This lack of guidance leads to misdiagnosis and inappropriate antimicrobial use. Objectives: We aimed to analyze our clinical practice surrounding the management of UTI in our NICU with infants born at < 32 weeks gestational age (GA). Material and Methods: The chart review was conducted on preterm infants born at < 32 weeks (GA) in our level III NICU between January 2020 and December 2022. The data was collected from clinical charts, laboratory results and radiological findings. Demographic information, including sex, birthweight, mode of delivery, etc., is seen in Table 1.0. With guidance from Canadian Paediatric Society and American Association of Pediatric guidelines on management of UTI, three distinct UTI diagnostic criteria were created for accurate diagnosis of true UTI, UTI in progression, and false positive UTI Results: Through ICD coding, a total of 43 episodes of UTI in 31 patients (prevalence 11%) were identified. According to our diagnostic criteria, 27 episodes were falsely positive with an alternate diagnosis (Table 2.0). Enterococcus Faecalis was the most common organism identified; this increased prevalence may give insight into the overuse of specific antibiotics in the NICU. A total of 550 doses of antibiotics were used in infants with falsely diagnosed UTI. We estimated that 218 doses of antibiotics could be avoided with false positive UTI diagnosis. Conclusion: The UTI diagnostic criteria developed can be validated by incorporating the guidelines into clinical practice for UTI's in extreme preterm infants. The UTI diagnostic criteria can be used as a quality improvement intervention for judicious use of antibiotics in the NICU, which should be followed by a repeat PDSA cycle study.

Poster PRESENTATIONS
3:00 – 3:30 pm
Undergraduate Category 2

Improved diagnosis of hypoxic ischemic encephalopathy in newborns using a targeted urine mass spectroscopy platform.

Jae Newton, Salah Almubarek, Maryam Alyari, Sibasis Daspal, Kim Davis, Anas El-Aneed, and Darryl J Adamko**.**

Sustainable Development Goal 3: Good Health & Wellbeing

The birth of an infant is a physiologically stressful event, and a degree of hypoxemia occurs. Unfortunately, some deliveries are more difficult with more hypoxemia causing end-organ damage. Such damage to the brain is called hypoxic ischemic encephalopathy (HIE). Neuroprotective cooling therapy is used to prevent HIE, but it must be applied within a relatively short period of time. While cooling therapy is successful in preventing hypoxic ischemic encephalopathy (HIE), current diagnosis is limited to history and serum lactate. There are many infants at risk of HIE that do not receive therapy. Metabolomics allows for the rapid non-invasive assessment of a multitude of breakdown products of physiological processes. We hypothesized that urine mass spectrometry (MS) analysis could better identify infants at risk of HIE. Newborns admitted to the NICU for cooling therapy for HIE, were recruited (n=11) and compared to 4 healthy infants in normal nursery. A targeted MS-MS platform measured 42 metabolites in urine samples. Using PLS-DA analysis, we identified 12 urinary metabolites that differentiated HIE versus healthy infants. This was better than using physiologic measures alone. Metabolomic profiling of urine has potential for identifying neonates that have undergone episodes of hypoxia.

Exploring Indigenous girls' identities in sport

Jaira Cross Child, under the supervision of Dr. Leah Ferguson

Indigenous girls are an underrepresented group in sport. Participation in sport is important because Indigenous youth can have rewarding experiences that can impact their wholistic health (i.e., spiritual, physical, emotional, and mental health). An important component of wholistic health is identity. Identity is positively impacted by sport participation. Exploring Indigenous girls' identities in sport will help us better understand the impacts and experiences of sport for this underrepresented group and may help more Indigenous girls experience the wholistic benefits that sport has to offer. The purpose of this qualitative study was to apply a strengths-based approach to explore Indigenous girls' identities in sport. Two First Nations girls (Mean age = 15.0 years) who currently participate in sport engaged in a sharing circle and photovoice reflection where a strengths-based approach was used through the celebration of participants' voices and the incorporation of Indigenous ways of knowing. Transcribed data was analyzed and four themes were generated: (1) The multi-sport athlete experience. Both participants reported participating in a variety of sports (i.e., softball, track and field, volleyball, basketball, futsal, and soccer), which added a diversity of experiences to the conversation. (2) Sport is a wholistic experience. Participants spoke about mental, physical, and emotional experiences within their sport journeys. (3) Accomplishment is important to who I am. Discussions included how accomplishments are fulfilling moments in sport and that resiliency and goal-setting are important within sport journeys. (4) Identity is rooted in our connection to others. How participants identified themselves was based on how they show up in the world and on their connections to others. The results add to the knowledge base that sport experiences can impact wholistic health and identity development, specifically for Indigenous girls. Because sport is a place where Indigenous girls can develop their identities, we should create more spaces in sport for these girls.

Pediatric Pain Management during Non-Invasive Procedures: Caregiver Perspectives

Alishba Muzaffar, Tracey Carr, Johnathan Melville

This study explores caregivers' knowledge and expectations regarding pediatric pain management in, focusing on minor procedural pain through qualitative interviews conducted with caregivers at Jim Pattison Children's Hospital. Despite the critical role of caregivers in pain management, gaps persist between evidence-based knowledge and current practices, particularly in minor, non-invasive procedures for children aged 0-18 years. Operationalizing pediatric procedural pain as sensory and emotional experiences related to non-invasive procedures, the study seeks to gather caregivers' knowledge, expectations, and experiences surrounding pediatric pain management. Caregivers were asked about their expectations from healthcare professionals, their satisfaction levels with current communication and collaboration practices, and their insights on information, education, and decision-making processes related to pediatric pain management. Caregivers offered valuable suggestions for improving pediatric pain management, advocating for improved dissemination of information, collaborative decision-making, and tailored interventions that address the unique needs of children undergoing painful procedures. Central to caregivers' narratives is an overall appreciative perception of healthcare providers, as well as an expressed need to be heard and understood, and for consequences of painful procedures to be addressed. By focusing on minor procedural pain, this study aims to harness caregiver insights regarding their child's pain management to inform clinical improvement strategies to mitigate the long-term effects of poorly managed pain and foster improved trust and communication between healthcare providers and caregivers.

Best Practice for Transition from Pediatric Complex Pain Care: A Scoping Review

Monica Ouellet, Amanjot Kaur, Susan Tupper, Janet Gunderson, Krista Baerg

Background: Many adolescent and young adults (AYA) experiencing chronic pain often continue to have pain in adulthood and thus must make the transition from pediatric care to adult care. Persistent pain and disability due to chronic pain throughout young adulthood can disrupt the attainment of important developmental milestones at transition to adulthood that impact quality of life. Inadequate transition planning may be associated with poor health outcomes and increased health utilization. However, only few studies have described the specific transition protocol from pediatric to adult care that AYA with chronic pain must make.

Objectives: To improve understanding of transitional care needs during transition planning and after transition (quality of care), this paper will determine known barriers to successful transition from pediatric chronic pain care to adult care as well as factors associated with successful transition from pediatric multidisciplinary pediatric chronic pain care, identify patient care needs at transition from pediatric chronic pain care, and finally describe the best practice (existing frameworks) to support youth at transition from pediatric chronic pain care.

Methods: This scoping review used previously published Arksey and O'Malley framework and followed the PRISMA guidelines. It sought to answer the following questions. What are the barriers to successful transition and what factors are associated with successful transition from pediatric chronic pain care to adult care? What are patient care needs at transition from pediatric chronic pain care? How can we best support youth at transition from interdisciplinary pediatric chronic pain care? A literature search was carried on Ovid Medline and 12 studies (11 research articles and 1 dissertation) published from 2015 to 2022 were included in the review, with only one theoretical transition framework that may be useful in the Canadian healthcare setting.

Results: In this scoping review, interpersonal, organizational, and systemic barriers and enablers for successful transition were identified. The most frequently identified barriers to successful transition include lack of self-efficacy, trust, communication, coordination of care between pediatric and adult care. A need of early transition, an individualized approach, fluid and dynamic transition process, and age-appropriate resources were identified as primary patient care needs during transition. Four frameworks supporting transitional care for AYA with chronic health conditions were identified.
Conclusion: Limited evidence suggests that there is lack of standardized transition protocol for clinical use. There is an urgent need for an evidence-based transition tools for clinical use for AYA with chronic pain.

Weight Bias Among Canadian Pediatric Healthcare Professionals

Taylor Dennison, Sarah Nutter, Nita Chauhan

Sustainable Development Goal 3: Good Health & Wellbeing
SDG 16: Peace, Justice, and Strong Institutions

Introduction: Weight bias negatively affects provider judgment and decision-making, as well as leads to healthcare delay and avoidance. While weight bias in healthcare professionals towards adult patients has been well-documented, there remains little work done regarding weight bias in pediatrics, particularly in Canada. This research examined weight bias in healthcare providers working in pediatrics in a Canadian healthcare region.
Methods: An anonymous cross-sectional survey was distributed to multidisciplinary healthcare workers across the health region who work with pediatric patients. The survey included measures of provider perceptions of parents of pediatric patients with obesity, weight stigma towards pediatric patients with obesity, weight controllability beliefs, and blame towards people with obesity.
Results: 113 respondents were included. 88% of respondents identified as women, and 73% identified as White. The most represented profession was Nursing at 50%. Weight controllability beliefs were directly and indirectly, via blame, associated with negative perceptions of parents of pediatric patients with obesity. Weight controllability beliefs were also indirectly associated with weight stigma towards pediatric patients with obesity themselves, via blame.
Conclusion: These findings highlight the importance of weight controllability beliefs in the stigma towards parents and their children with obesity, and the ensuing blame that can occur when healthcare providers believe that weight is within individual control. Further research in our institution is in progress to broaden respondent diversity so that our results may be generalizable to across Canada, and to elucidate the consequences of this bias on provider behavior and pediatric patients' experiences.

Submitted Abstracts – Did not attend.

Ironing out the BPAN phenotypic spectrum: A report of three new BPAN cases and review of the literature

Caitlin Goedhart, *Stephanie Skinner, Caroline Brost, Shuaa Basalom*

Background:
Neurodegeneration with brain iron accumulation (NBIA) refers to a spectrum of disorders, which as the name suggests, involve abnormal iron accumulation within the brain that leads to progressive nervous system degeneration. NBIA type 5, which is more commonly referred to as Beta-propeller protein-associated neurodegeneration (BPAN), is one example of a disorder within this group. BPAN is an X-linked condition and is typically caused by loss of function mutations in the WDR45 gene. Classically, BPAN has been characterized by global developmental delay (GDD) and seizures in childhood, followed by neurodegeneration in adulthood. Neurological symptoms can progress to include parkinsonism, dystonia, and dementia.
Methodology:
We have identified three new cases of BPAN as well as provided updated clinical information on a previously reported case. All four patients are followed at a single center in Saskatchewan, Canada. Consent for file review and publication of anonymized information was obtained for each case. Identification of WDR45 variants was accomplished through multi-gene testing panels or whole exome sequencing.
Results:
Of the three unpublished cases, two of the patients were found to have de novo pathogenic frameshift variants (NM_007075.3: c.954del, p.Lys319Argfs*11 and NM_007075.3: c.561_564dup, p.Ile189Hisfs*8). The third patient was found to have a missense variant of uncertain significance (NM_007075.3: c.359T>C, p.Leu120Pro) but with clinical signs and symptoms supporting a BPAN diagnosis. All the patients shared common features including seizures, GDD followed by intellectual disability, and abnormal MRI findings. The severity of symptoms ranged between patients. Of interest, the male patient in the cohort demonstrated pulmonary hemosiderosis, which has yet to be associated with BPAN in the literature. He was first seen by Pediatric Respirology for pulmonary hemorrhage at almost 2 years of age. Bronchoscopy showed signs of inflammation and lung biopsy of his right middle lung lobe revealed pulmonary hemosiderosis, mild lymphoid hyperplasia, mild bronchiolar smooth muscle hypertrophy, and alveolar duct and airspace distension.
Conclusion:
Improved awareness of the phenotypic variability of BPAN, the uptake of more comprehensive diagnostic modalities like whole exome sequencing, as well as advances in neuroimaging have greatly improved clinicians' abilities to diagnose the disease. In conclusion, although common features are shared among cases, there is phenotypic variability related to the severity of features seen as well as the presence of additional diagnoses like pulmonary hemosiderosis. Further study is needed to elucidate the prevalence of iron deposition in organs other than the brain.

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. We hypothesized this survey would indicate alarming rates of burnout, emotional exhaustion and low satisfaction of work-life balance among physicians in Saskatchewan. The data supports the hypothesis, with over half of participants scoring "at risk" on the ePWBI, and general practitioners experiencing the brunt of it. Our findings are congruent with the recently published National Physician Health (NPHS) Survey conducted in 2021, which found dramatic increases in burnout among Canadian physicians compared to pre-pandemic data. This study will serve as a tool to inform physician mental health support resources, and as a baseline to follow burnout trends over time.

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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