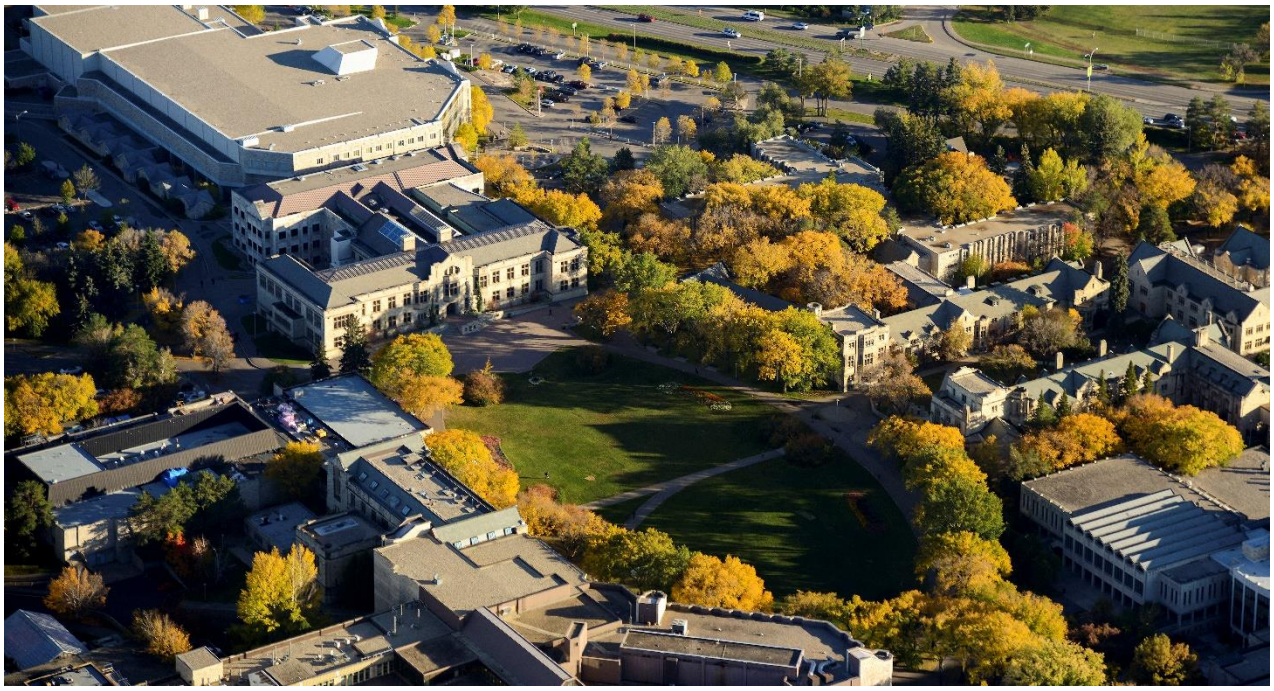
Department of Pediatrics
University of Saskatchewan



Presents

2022 Child Health Research Trainee Day

Thursday April 28, 2022
12:00 pm -4:00 pm

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INNOVATION GROUP

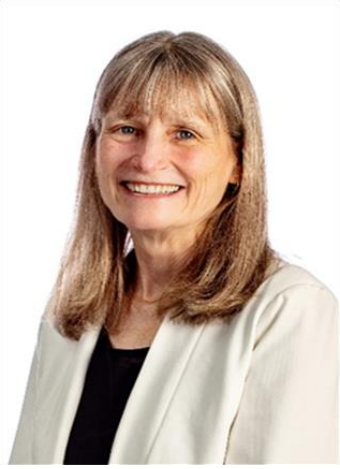
Child Health Research Trainee Day
Thursday, April 28, 2022
12:00- 4:00 pm

12:00-12:05 pm	Welcome and Opening Remarks **(Dr. Darryl Adamko)**
12:05-12:50 pm	**Dr. Sandra Davidge** (Keynote Speaker) *"It started with a question and a passion....my research in maternal and perinatal cardiovascular health and the lessons learned along the way"*
1:00-1:10 pm	Lightning Round (Undergraduate)
	Riley Plett (Medicine)
	McKenzie Van Eaton (Medicine)
	Emily Harwood-Johnson (Medicine)
1:10-1:25 pm	Lightning Round (Graduate)
	Yekeen Abu-Shiraz (MSc. Kinesiology)
	Melissa Leonzio (MSc. Kinesiology)
	Pamela Farthing (Ph.D Nursing)
	Geneveave Barbo (Ph.D Nursing)
	Keely Shaw (Ph.D Kinesioogy)
1:30-1:35 pm	*Break (Trivia Questions)*
1:35-1:55 pm	Lightning Round (Residents)
	Chris Christensen (Pediatrics)
	Amelie Cyr (Pediatrics)
	Kaitlyn Lopushinsky (Pediatrics)
	Natasha Mense-Dietrich (Pediatrics)
	Mackenzie Simpson (Pediatrics)
	Olivia Griffin (Pediatrics)
1:55-2:00 pm	*Break (Trivia Questions)*
2:00-3:30 pm	Long Presentations
	Morgan Schatz (Undergraduate – Medicine)
	Marley Wacker (Undergraduate – Medicine)
	Shea Beaulieu (MSc. – Kinesiology)
	Rafique Khan (MSc. -Kinesiology)
	Matthew Chapleski (Ph.D – Kinesiology)
	Kristina Sobolewski Ph.D – Kinesiology)
	Joshua Emery (Resident – Pediatrics)
	Kaitlyn Lopushinsky (Resident- Pediatrics)
	Mallory McNiven & **Netusha Thevaranjan** (Residents- Pediatrics)
3:30 pm	Closing Remarks

Keynote Speaker **Dr. Sandra Davidge**

will present

"It started with a question and a passion....my research in maternal and perinatal cardiovascular health and the lessons learned along the way"



Dr. Sandy Davidge is the Executive Director of the Women and Children's Health Research Institute, a Distinguished University Professor at the University of Alberta, Edmonton Canada and a Fellow of the Royal Society of Canada and Canadian Academy of Health Sciences. Dr. Davidge serves on many national and international grant panels and serves on the editorial board for the American Journal of Physiology, Hypertension and Biology of Sex Differences. Dr. Davidge's research program encompasses studying cardiovascular function as it relates to 1) complications in pregnancy (preeclampsia and maternal aging) and 2) developmental origins of adult cardiovascular disease. This research is focused on understanding maternal vascular complications as well as developing early intervention/prevention strategies for improving long-term cardiovascular health for the offspring. With her team of trainees, for whom she has mentored >40 national and international graduate students and postdoctoral fellows, Dr. Davidge has published over 250 original peer-reviewed manuscripts and review articles in these areas.

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LIGHTNING ROUND – UNDERGRADUATE PRESENTATIONS

Empowering sickle cell patients and families through innovative education methods

Riley Plett, Sarah Tehseen, Kathleen Felton, Craig Eling, Vivian Sheppard, Megan Pegg, Roona Sinha

Sickle Cell Anemia (SCA) is a group of inherited blood disorders caused by a mutation in the beta subunit of hemoglobin (HbS). There are approximately 5000 Canadians living with SCA including children. Pediatric SCA patient education can: improve knowledge, decrease hospitalization, improve medication possession ratio, lead to better SCA related functioning, and lower pain impact. An innovative educational cartoon video targeted towards adolescents with SCA was developed to improve knowledge and self-efficacy regarding illness management of patients and parents/guardians. Patients (aged 10 – 18) with SCA and parents/guardians of patients (aged 0 – 18) were recruited online via flyers emailed to patients and posted to patient organization sites. Participants completed pre and post-tests that assessed knowledge, self-efficacy and satisfaction. The educational video improved knowledge scores in participants ($p = 0.04$). The educational video did not statistically significantly improve self-efficacy scores in participants ($p = 0.22$). 100% of participants were "Very Satisfied" with the educational video. Recruitment is ongoing for multiple focus groups (for caregivers and patients) to gather additional feedback.

Physician Health and Wellness- A Peer Support Program at the Pediatric Department Of Regina General Hospital

McKenzie Van Eaton, BSc (Hons); Sanjida Newaz, MBBS, MSc; Polya Ninova, MD

Physicians experience high rates of burnout due to the job related demands and emotional stressors. As a result, physician health and wellness initiatives have been sought out to mitigate burn out, and work towards advocating for physician well-being. Peer support programs have been used, and found to be effective, in mitigating burn out by utilizing the innate tendency to respond and empathized with shared difficulty. Our study evaluated the effectiveness of peer support and the recommendations needed to implement such a program on a larger scale. 14 physicians from the Regina General Hospital Pediatric department were paired to have informal virtual meetings (during COVID-19) every two weeks for three months. Following the program, physicians were individually interviewed and participated in a short cross sectional survey to understand the experience and perception of the program. Results showed a perceived benefit and value towards the program with an interest in continuing in a more formal fashion. The small department and the inability to meet naturally in person (due to COVID-19) provided limitations. Future indications of the program include continuation, expansion, and advocacy for the program. While providing a more formal structure with administrative support for schedule integration and protected time.

Community treatment of latent tuberculosis in pediatric and adult refugee populations: Outcomes, successes, and challenges.

Emily Harwood-Johnson, Dr. Mahli Brindamour, Dr. Jacelyn Hanson, Dr. Karen Leis, Dr. Yvonne Blonde, Dr. Jordan Olfert

Tuberculosis is a leading cause of death due to infectious disease worldwide (1). In Canada, the majority of latent tuberculosis infections (LTBI) are experienced by newcomers from endemic regions(2). Prophylactic treatment is needed in certain cases to avoid the development of active tuberculosis. The purpose of this study was to measure LTBI prophylaxis completion rates at a local refugee clinic and compare to rates reported in Canadian refugee health literature. A secondary outcome of this study was to measure LTBI screening test positivity (Mantoux and IGRA) in our patient population. Clinic charts were reviewed for all refugee clinic patients with a positive IGRA or Mantoux from January 2017-June 2021 (N=125). Screening test positivity was 24.2% and 24.3% for Mantoux and IGRA tests,

respectively. Treatment prophylaxis was available to all patients who tested positive on screening tests. At the refugee clinic, the prophylaxis initiation rate was 86.1% and the prophylaxis completion rate was 93.3%. Completion rates did not vary significantly by age, gender, or region of origin, however varied significantly depending on prophylaxis regimen ($p<0.0001$). The refugee clinic completion rates in this study appear to be higher than those reported in the Canadian refugee health literature (3)(4).

1. Tuberculosis (TB) [Internet]. [cited 2021 May 14]. Available from: https://www.who.int/news-room/fact-sheets/detail/tuberculosis
2. Kiazyk S, Ball T. Latent tuberculosis infection: An overview. Can Commun Dis Rep. 2017 Mar 2;43(3–4):62–6.
3. Rennert-May E, Hansen E, Zadeh T, Krinke V, Houston S, Cooper R. A Step toward Tuberculosis Elimination in a Low-Incidence Country: Successful Diagnosis and Treatment of Latent Tuberculosis Infection in a Refugee Clinic. Can Respir J. 2016 Feb 24;2016:e7980869.
4. Benjumea-Bedoya D, Becker M, Haworth-Brockman M, Balakumar S, Hiebert K, Lutz J-A, et al. Integrated Care for Latent Tuberculosis Infection (LTBI) at a Primary Health Care Facility for Refugees in Winnipeg, Canada: A Mixed-Methods Evaluation. Front Public Health [Internet]. 2019 [cited 2021 May 18];7. Available from: https://www.frontiersin.org/articles/10.3389/fpubh.2019.00057/full

LIGHTNING ROUND – GRADUATE PRESENTATIONS

Evaluation of the Body Composition of Children with Congenital Heart Disease in comparison to Healthy Peers

Abu-Shiraz, Y., Chapelski, M.S., Chartier, M., Tomczak, C.R., Baxter-Jones, A.D.G., Pockett, C., Kakadekar, A., Pharis, S., Bradley, T.J., Wright, K.D., Erlandson, M.C.

Introduction: Congenital heart disease (CHD) is among the world's leading birth abnormalities. Advancements in detection and treatment mean more of these children will have longer lifespans. Despite the promising improvements and steady rise in survival rates, children with CHD face significant health challenges in both the short- and long-term. Specifically, this is highlighted by emerging evidence showing CHD is associated with disproportionately higher obesity, morbidity, and health care costs in adulthood. As such, understanding the body composition of children with CHD will help us better understand its impact on their development, while also allowing us to discover new ways to mitigate health disparities in this population. Therefore, the purpose of this study was to evaluate the body composition of children with CHD compared to healthy age and sex matched controls using Dual Energy X-Ray Absorptiometry (DXA).

Methods: Forty-five children with CHD (age = 11.3 ± 2.5 n = 20 females) and twenty-five healthy age- and sex-matched controls (age = 11.6 ± 2.5 n = 13 females) were examined using full body DXA. Demographics such as age, height, and weight were examined using independent sample t-tests. Body composition measurements (fat mass, lean mass, bone mineral content, bone mineral density and bone area) were assessed by analysis of covariance (ANCOVA) with age, sex, height, weight, and physical activity included as covariates. All analyses were performed using SPSS version 28 and significance was set at $p<0.05$.

Results: No significant differences between groups for age (11.31 ± 2.5 vs 11.6 ± 2.5), height (145.3 ± 15.8 vs 149.4 ± 16.5), weight (41.9 ± 19.1 vs 43.7 ± 15.4) , waist circumference (69.0 ± 13.0 vs 67.0 ± 10.0), and BMI (19.0 ± 4.5 vs 18.9 ± 3.6) were found ($p>0.05$) (CHD vs control). However, control participants reported significantly higher levels of physical activity ($p < 0.05$). When comparing CHD and control participants there were no significant differences in any of the body composition measures between the groups.

Conclusion: Our preliminary findings suggest that there is no difference in body composition of children with CHD and their healthy counterparts. Future studies should focus on increasing the sample size, as this might influence the significance between groups. Furthermore, focusing on sex differences between group could also have important implications.

Body fat measurement in adolescences: comparison of skinfold equations with DXA

M. LEONZIO, S. BEAULIEU, A. HIDALGO-MAZZEI, T. HYRICH-KRUGER, A.D.G. BAXTER-JONES and M.C. ERLANDSON

Background: There are numerous methods to assess percentage body fat (PBF) in children and adolescents including: underwater weighing, air displacement plethysmography, labeled water techniques, and dual-energy X-ray absorptiometry (DXA). However, these laboratory methods are not suitable for field studies. Skinfold thickness is often used as a field method. Several equations exist to predict PBF from skinfolds, most are age and sex dependent. Adolescence is a critical period of growth when there is great variation in maturity status, which influences fat accrual. However, very few equations control for maturity when predicting PBF. The purpose of the present study was to compare commonly used equations and align them by a measure of maturation, namely years from peak height velocity (PHV). **Methods**: Participants were drawn from the University of Saskatchewan's Pediatric Bone Mineral Accrual Study (PBMAS; 1991-2017). The study used a mixed longitudinal cohort design recruiting, between 1991-93, 251 children into 8 age-cohorts (8 to 15 years) and measuring them serially between 1991 to 2017. Serial measures of anthropometry (height, weight, skinfolds, etc.) and DXA scans were collected. PHV was estimated by fitting cubic splines to height velocity data. A biological age was calculated as age at test-age minus age at PHV. Two equations of body composition were used Slaughter et al (S) and Lean et al (L) to predict PBF from skinfold assessments. PBF was also obtained from a DXA scan. Data were aligned by biological age groupings and differences between equation estimates calculated. **Results**: In males it was found that prior to PHV there was good agreement in PBF between the S equations and DXA scans ($p>0.05$); however, after PHV percentage body fat was systematically underestimated ($p<0.05$), a similar pattern was observed in females. Equation L underestimated percentage fat mass from -5 years from PHV ($p<0.05$) with the difference increasing with increasing biological age, in both males and females. **Discussion**: These results illustrate skinfold equations systematically underestimate PBF and the differences are biological age dependent. These results suggest that to improve accuracy in predictions in addition to being age and sex dependent they also need to be maturity dependent.

Managing the Unmanageable through Interdependence in Adolescents Living with Type One Diabetes and their Parents: A Constructivist Grounded Theory

PAMELA FARTHING, RN, BA, MSC, PHD(C); DR. JILL BALLY, RN, PHD; DR. MARIE DIETRICH LEURER, RN, PHD; DR. LORRAINE HOLTSLANDER, RN, PHD; DR. MUNIER A. NOUR, MD, FRCP; DR. DONNA RENNIE, RN (Ret.), PHD

Background and Purpose: Management of type 1 diabetes (T1D) is complex and requires continuous care and monitoring that place many demands on adolescents with T1D and their parents. The purpose of this study was to explore the nature of interdependent T1D management with adolescents and their parents.

Methodology: Using a constructivist grounded theory approach, 32 open-ended interviews were conducted, transcribed, and analyzed from 11 adolescents aged 10-18 years with T1D and eight parents. The data were coded using three coding phases: initial, focused, and theoretical and this process continued until theoretical saturation was reached.

Findings: The substantive theory that emerged from the data describing parents' and adolescents' main concern of *Maintaining Optimal Glycemic Control* was *Managing the Unmanageable through Interdependence.* Four related subprocesses were found: *Completing T1D Tasks*, *Attaining Support*, *Balancing Independence*, and *Reconciling Reality*. These occurred within the context of the ever-changing *Nature of the Illness*. There is a dynamic relationship associated with interdependence between adolescents with T1D and their parents that varies situationally and by age. Participants in this study defined interdependence as having a support network or being on a team, adding that members of their team included mainly parents, but also family members, diabetes health care specialists, teachers, coaches, and peers, all working together through different roles to support a stronger, healthier adolescent with T1D.

Implications: Knowledge of the complexity and flexibility of care required to manage T1D seems important to ensure healthcare professionals can regularly re-evaluate interdependence in daily management of T1D by parents and

adolescents. Attaining support for both the adolescents and the parents with completing T1D tasks, stress management, and balancing independence from inside and outside of the family may be useful. Healthcare professionals could instruct how to complete relevant T1D tasks, assist in establishing a support network, and encourage parents and adolescents to appropriately share the responsibility of managing T1D.
Future research into the dynamic nature of interdependence with T1D management during adolescence is required. Conclusion: Current practice in the care of adolescents with T1D is encouragement towards independence and self-reliance in disease management. Results from this study suggest that adolescents and their parents benefit from an interdependent relationship that includes the support of others within their community. The relationship is dynamic and varies depending on tasks as they seek to attain optimal glycemic control. Interdependence extends beyond the family environment and additional research is needed.

An integrative review on mental health access barriers encountered by youth refugees and asylum seekers and their potential solutions

GENEVEAVE BARBO

Children and youth represent 30% of the world's population; however, they account for 42% of those who were forcibly displaced in 2020, which includes refugees and asylum seekers. This percentage is rapidly increasing each day due to conflicts, natural disasters, and human rights violations. A refugee is someone unable or unwilling to return to their country of origin owing to a well-founded fear of being persecuted, while an asylum seeker is a person who is in the process of claiming refugee status. Children and youth refugees and asylum seekers are particularly vulnerable to mental health difficulties. Serious post-traumatic stress disorder, depression, and anxiety symptoms have been attributed to such population during their resettlement to host countries. Yet, they encounter numerous barriers to accessing mental health care, particularly during the COVID-19 pandemic. Without access to these services, children and youth refugees and asylum seekers will likely experience more psychological traumas and physical conditions, while decreasing their life expectancy and ability to achieve future contributions to society. This presentation aims to demonstrate our review that focused on the following questions: what are the barriers to mental health access experienced by youth refugees and asylum seekers and what are the implemented or proposed solutions in addressing these barriers. Through an integrative review of literature, published and unpublished articles on "youths", "refugees/asylum seekers", "mental health conditions", and "access/utilization of healthcare/health services" were screened for eligibility. Sources of data include CINAHL, PubMed, PsycINFO, EMBASE, Web of Science, ProQuest Dissertations & Theses Global, and other relevant organizations' websites. Eligible articles will then be assessed for their methodological quality. Next, pertinent data will be extracted and analyzed using thematic analysis. We anticipate that findings will reveal major barriers relating to cultural and language differences, stigma, discrimination, lack of affordable services, long wait times, and unavailability of services. With better understanding of the access to barriers, more targeted solutions may be developed and examined. Potential solutions may include the integration of newcomer navigators, cultural competence training for health care providers, and/or transformative care. This review will assist in determining the gaps in the literature and future research directions to ensure the mental health needs of youth refugees and asylum seekers are met.

Wearing of a facemask in ice-hockey playing youth during the COVID-19 pandemic does not affect performance

KEELY A. SHAW, SCOTTY J. BUTCHER, JONG BUM KO, ABDI ABSHER, JULIANNE GORDON, CODY TKACHUK, GORDON A. ZELLO, PHILIP D. CHILIBECK

During a game of ice hockey, players are regularly in close contact with each other, increasing the risk of spreading infectious diseases that travel through respiratory droplets, such as the SARS-CoV-2 virus. The close contact and increased breathing rates that occur during intense exercise have led to a high number of COVID-19 outbreaks within hockey teams across North America. Face masks are an effective measure in reducing the spread of respiratory droplets which, in turn, decreases the spread of such infectious diseases. Our previous research found that wearing a face mask during exercise has no impact on performance or oxygenation during short-duration, high-intensity exercise (Shaw et al., Int J Environ Res Public Health, 2020), but no known research has been carried out investigating the impact of wearing face masks on sports performance in children and youth. The purpose of our research was to examine the effect of wearing a face mask during a progressive skating test in youth hockey players (9-14y). Twenty-four youth (19 males, 5 females, age 11.9±1.6y) completed an on-ice progressive skating test (Yo-Yo IR1-IHmax) and a simulated hockey period on a cycle ergometer with and without a surgical mask in a randomized cross-over trial. No differences were observed between the two conditions (mask=290±119m covered; sham mask=301±104m covered; p=.85) for the on-ice testing or for performance, heart rate, or arterial oxygen saturation during the simulated hockey period. However, tissue oxygenation index was lower from shifts one to six for males ($p < 0.05$) and shift seven for females ($p < 0.01$) while wearing a mask compared to not wearing a mask, although these differences were small and not likely of clinical significance. Our results suggest that youth hockey players can wear a face mask while skating with no impact on their performance and minimal impact on muscle oxygenation. Funded by the Jim Pattison Children's Hospital Foundation through the Saskatchewan Health Research Foundation.

LIGHTNING ROUND – REDISENT PRESENTATIONS

Metabolomic Predictors of Childhood Asthma

CHRISTENSEN, C., CONLY, C., AND ADAMKO, D.

Irreversible damage to the airways results from undiagnosed asthmatics, resulting in reduced lung function into adulthood. Asthma frequently starts before the age of 6, when a diagnosis has to be made clinically. Mass spectrometry has previously identified several metabolomic urinary products that correlate with respiratory illnesses. This project intends to compare reported and observed asthma severity to urinary metabolomic products. Fifteen pediatric patients with a known diagnosis of asthma were recruited for longitudinal assessment over 6 months. Pulmonary function tests, questionnaires assessing burden of disease, and daily tracking of asthma severity were measured on each visit, and compared against the urinary metabolomics markers found in respiratory illnesses. Positive results may predict disease severity and aid in the diagnosis of childhood asthma prior to initial presentation.

Presence of Pulmonary Edema on Lung Ultrasound as an Indicator of Hemodynamically Significant Patent Ductus Arteriosus in Preterm Neonates

AMÉLIE CYR, SIBASIS DASPAL, VERONICA SAMEDI, PROSANTA MONDAL

Background: Patent ductus arteriosus (PDA) is a common clinical condition in preterm infants. Different clinical and echocardiographic markers have been identified to determine whether a PDA is hemodynamically significant (hsPDA) or not (non-hsPDA). Determining whether a PDA is hemodynamically significant or not in a neonate is clinically relevant to evaluate the risk of associated morbidities and to determine the subsequent management course. Pulmonary edema is a known consequence of hsPDA and can be evaluated with a bedside neonatal lung ultrasound. Compared to echocardiograms, neonatal lung ultrasounds are a more accessible bedside tool that is easy to interpret.

Objective To evaluate whether the assessment of pulmonary edema by lung ultrasound is a reliable sonographic indicator of hsPDA. Lung ultrasound could then be an accessible bedside tool used to evaluate if a PDA is hemodynamically significant and to assist with decision-making regarding its management along with other clinical and echocardiographic indicators.

Material/Methods Twenty infants with a mean gestational age of 27 weeks underwent echocardiography and lung ultrasonography at a postnatal age of 7 days. PDAs were classified as hsPDA or non-hsPDA based on echocardiogram indicators. Lung ultrasound scores were correlated with echocardiogram findings.

Results Fourteen neonates had an hsPDA and 6 neonates had a non-hsPDA. The mean lung ultrasound scoring was significantly different between neonates with HsPDA (10.6) and neonates with non-HsPDA (6.1, p-value 0.006).

Conclusion This study shows that higher ultrasound scores suggesting pulmonary edema correlate with the presence of a hemodynamically significant PDA. There are several limitations to this study including the small sample size and the limited specificity of lung ultrasound scores for pulmonary edema only. Like other sonographic markers, neonatal lung ultrasound scores must be used in correlation with other clinical findings as part of decision-making processes. However, these findings could serve as the basis for future research with bigger sample sizes.

Looking Back to Gauge the Path Forward: Retrospective Review of the Provincial Pediatric Trauma Program

Kaitlyn Lopushinsky MD[1]; Tanya Holt MD, FRCPC, MSc[1,2]; Gregory Hansen MD, FRCPC, MPH, MSc[1,2]

A coordinated pediatric trauma program was recently developed for the province of Saskatchewan without knowledge of baseline statistics of provincial pediatric trauma cases or trends in case data.

To bridge this gap in knowledge, an extensive retrospective chart review was performed to determine case variables that will guide further development of the pediatric trauma program as well as to find trends that exist within pediatric trauma transports in Saskatchewan. Cases from 2019 to 2021 pediatric trauma transports directed to Jim Pattison Children's Hospital were reviewed in context of research validated scores such as the Pediatric Trauma Score and National Advisory Committee for Aeronautics score for pre-hospital severity status. Other variables reviewed included case-specific factors like mechanism of injury as well as general in-hospital severity markers including the presence of airway instrumentation or use of inotropic support. These data were then compiled into a provincial data set that will be further analyzed for trends in the pre-hospital and hospital admission data.

The data gleaned from this review will guide the ongoing development and growth of the provincial pediatric trauma program through analysis of the case variables as well as through comparison between these data and those found from other pediatric trauma programs nationally and internationally.

PoCUS for Determining Neonatal Heart Rate by NICU Healthcare Providers

NATASHA MENSE-DIETRICH, MD; DANIKA ETHIER, RN; ASMA NOSHERWAN, MD; SIBASIS DASPAL, MD

Heart rate is a key measure used to determine the need for escalation of care in neonatal resuscitation at the time of delivery. Current research suggests that electrocardiography (ECG) monitoring is the fastest method for heart rate determination, followed by pulse oximetry (PO) monitoring. Doptones are also readily available and used for fetal heart rate assessment in delivery rooms around the world, and more research on its use in neonates is emerging. While point of care ultrasound (PoCUS) has increasingly become available in pediatric care settings, it has not been explored strictly for the assessment of heart rate in newborns.

This two-part study will assess a purpose-made program developed to train neonatal rescuscitation program (NRP) providers to use PoCUS and fetal Doptone technologies accurately, as well as directly compare the speed of acquisition and accuracy of first acquired heart rates determined by PoCUS, Doptone, PO, and ECG methods. NRP providers of multiple roles (including nurses, respiratory therapists, residents, neonatologists) will be provided a systematic and succinct training course to develop new skills in PoCUS and fetal Doptone use to determine heart rate. Qualitative data relating to the technologies and the course design will be collected prior to and following the coursework. Simulated resuscitation trials will be timed and heart rates documented to compare all four modalities. This non-inferiority study will directly compare mean and median values for heart rates collected by each method with a p-value of 0.05 used to detect significant difference. This study could offer an additional approach to assessing heart rate during neonatal resuscitation as well as contribute to the interprofessional medical education literature as it relates to specific skill acquisition.

THE EFFECTS OF ROUTINE WEIGHT CHECKS ON THE PEDIATRIC PATIENT EXPERIENCE

MACKENZIE SIMPSON, PGY-3; DR. AYISHA KURJI, MD

INTRODUCTION: The biopsychosocial effects of weight stigma are known to be some of the greatest complications of pediatric obesity and overweightness, although they affect youth of all sizes. Weight stigma itself is associated with multiple poor outcomes, including disordered eating and weight bias internalization, without any evidence to suggest an improvement in BMI or health. Instead, there is a growing body of literature suggesting that weight destigmatization is one of the most promising approaches to minimizing obesity/overweightness and the consequent effects on health. From both a review of the literature, as well as clinical our own clinical experience, we worry that some of this weight stigma and discomfort can be driven by the medical community.

METHODS: We are conducting a cross-sectional, anonymous survey to determine whether routine weight checks may be contributing to weight stigma. Our goal is to survey 100 patients (ages 8 and above) attending pediatric outpatient appointments at the Jim Pattison Children's Hospital (JPCH) and Kinsmen Children's Centre (KCC).

RESULTS: While we are unlikely to have all 100 surveys submitted by the time of the Child Health Trainee Research Day, we anticipate discussing preliminary results.

CONCLUSION: This study will explore if youth are affected by routine weight checks. By understanding how these measurements are received by youth, we may better understand some of the factors that perpetuate weight stigma within healthcare. Ultimately, we hope this study provides information to continue fostering a safe environment for our patients.

LESSONS LEARNED FROM A SMALL PEDIATRIC CONTINUOUS RENAL REPLACEMENT THERAPY PROGRAM

OLIVIA GRIFFIN, TANYA HOLT, AMELIE CYR, REBECCA BROCKMAN, LAURA WIHAK, GREGORY HANSEN

Continuous renal replacement therapy (CRRT) has become a pillar of care in pediatric intensive care units (PICUs) over the past few decades. Quality indicators (QIs) have been evaluated that reflect safe and accountable CRRT. However, there is a paucity of data on outcomes and QIs in smaller-volume CRRT programming. The purpose of this retrospective study was to evaluate the efficiencies, effectiveness, and outcomes of a small-volume CRRT program. Eighty-two patients received CRRT over a 13-year period, and

79% survived to discharge. Sepsis or nonseptic shock (*n* = 11 (22%) versus *n* = 6 (50%); value = 0.004) and time to CRRT initiation after PICU admission (1.1 versus 5.0 days; value = 0.005) were independent predictors for mortality. The program also had positive outcomes for QIs related to CRRT efficiency and time of initiation, dosing delivery, and rate of adverse events. This study is important as it illustrates the opportunity that smaller centers have to initiate CRRT programming and provide safe and effective care.

LONG PRESENTATIONS

Impact of shift to virtual care during the COVID-19 pandemic: Retrospective review of clinic metrics in a clinic providing general pediatric and team based virtual services

MORGAN SCHATZ, LUAN CHU, NIGATU GEDA, KRISTA BAERG

Introduction: The COVID-19 pandemic necessitated a large-scale implementation of virtual care services at many outpatient clinics.
Objectives: To evaluate the impact that virtual care had on various clinic metrics (visit volumes, duration, no-show rates, and wait-times) at two clinics located at Jim Pattison Children's Hospital: the General Pediatric Clinic (GPC) and the team-based Interdisciplinary Pediatric Complex Pain Clinic (IPCPC). The secondary objective was to determine patient travel time.
Methods: Pre- and post-pandemic 1-year cohorts were compared for this retrospective cohort study: the pre-pandemic (March 2019-February 2020) patients received traditional care and post-pandemic (May 2020-April 2021) received a blended model with both virtual and in-person care at the GPC (MD-only in-person, video, and phone visits) and virtual care only at the IPCPC (team video visits). The Electronic Medical Record was accessed to collect visit data and complete chart review. This data was entered into an excel spreadsheet and descriptive analysis was performed using SPSSX.
Results: During the study period there were 804 visits that corresponded to 287 patients. The GPC had 313 visits in the pre-pandemic cohort and 281 visits in the post-pandemic cohort. The IPCPC had 115 visits in the pre-pandemic cohort and 95 visits in the post-pandemic cohort. The GPC appointment durations were significantly longer ($p<0.001$) by approximately 7 minutes in the post-pandemic cohort, while the IPCPC had no significant change in appointment durations between the two cohorts. There were no significant differences in wait-times between the two cohorts at either clinic. At the GPC, phone visits had the highest no-show rate (8.3%), followed by in-person visits (6.1%), and then video visits (5.8%). At the IPCPC video visits had the highest no-show rate (8.7%), followed by in-person visits (2.8%).
Conclusion: Virtual care did not save physician time or improve clinic wait-times, but may have other benefits. No-show rates were higher for virtual care compared to in-person visits, and highest for phone visits. Clinic reminders for in-person visits may be a factor. Pre-pandemic, patients received a text reminder for in-person appointments and post-pandemic patients received a phone call to complete a COVID screening protocol.

A Retrospective Review of Coronary Complications in Children with Kawasaki Disease in Saskatchewan

MARLEY WACKER, TIM BRADLEY

BACKGROUND: Kawasaki Disease (KD) is an acute medium-sized vasculitis of childhood and associated with the development of coronary artery aneurysms (CAA), and is the most common cause of heart disease in infants and children in developed countries. The diagnostic criterion for typical KD is fever for 5 or more days and 4 out of 5 findings of bilateral conjunctival injection, oral mucosa involvement, lymphadenopathy, extremity changes and rash. Atypical KD is fever for 5 or more days and 2 to 3 out of the 5 clinical findings. Timely treatment with immunoglobulin (IVIG) has lowered the rates of CAA in KD from 25% to about 4%. The aim of this study was to determine in children

presenting with KD in Saskatchewan, if there are delays in IVIG treatment and increased rates of CAA, compared with other centres.

METHODS: We conducted a retrospective chart review of all children with KD presenting in Saskatchewan seen by the Pediatric Cardiology Service over the last 10 years. We abstracted data including patient demographics including location of residence, clinical presentation, diagnostic criteria for KD, treatments given and duration from KD onset to IVIG treatment, evidence of CAA on echocardiogram (maximum coronary artery z-scores >5), other system involvement, lab findings and clinical outcomes. We compared our results with data from a much larger study performed at the Hospital for Sick Children in Toronto.

RESULTS: Of 155 charts reviewed, 124 children with KD (aged 4.1±3.0 years, 88 males) were included, of which 71 had typical KD and 53 had atypical KD. In our study, 110 patients had prompt IVIG treatment ≤10 days (89% vs. 83%; CAA 4% vs. 4%), 8 had delayed treatment >10 days (6% vs. 10.5%; CAA 12% vs. 16%) and 6 had no treatment (5% vs. 6.5%; CAA 0% vs. 8%), when comparing to the Hospital for Sick Children study.

CONCLUSIONS: Children presenting with KD in Saskatchewan receive IVIG treatment more promptly and develop less CAA, compared with other centres.

Is there an association between critical growth periods in childhood and adolescence and adulthood obesity?

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Background: The increasing rates and prevalence of obesity is a growing concern; especially related to short- and long-term health consequences. It has been suggested that fat mass accrual during critical periods of growth contributes to overweight and/or obesity (OWO) status later in life. As a result, researchers have made vast efforts to analyze the relationship between critical growth periods and adulthood obesity. Critical periods include intrauterine growth (indexed by birth weight), post-natal catch-up growth (the period of adiposity rebound), and the period of adolescence (period of accelerated maturation). Previous research suggests that birthweights are associated with maturational timing. This is important as maturity timing (early, average, or late) is a risk factor for adiposity in adulthood. These previous studies have relied mostly on cross-sectional studies to retrospectively address this question. The objective of this longitudinal study was to determine if there was an association between birthweight, early biological maturation, and weight status in adulthood. **Methods**: Participants were drawn from the University of Saskatchewan's Pediatric Bone Mineral Accrual Study (PBMAS; 1991-2017). The study used a mixed longitudinal cohort design recruiting, between 1991-93, 251 children into 8 age-cohorts (8 to 15 years) and measuring them serially between 1991 to 2017. Demographic data was collected including birth weight and at each measurement occasion, anthropometrics (including BMI and Peak Height Velocity) and DXA scans (measuring body composition) were obtained. Multiple categories were then created including birthweight (BWCat), maturational timing (MatTiming), and BMI status. **Results**: Males born with low birth weight attained PHV at a later age ($p<0.05$) compared to those born with normal or high BW, contrasting with females in whom those with low birth weight obtained PHV at earlier ages ($p<0.05$). Normal weight and obese adult males tended to be early or average maturers while no relationship between maturity and adult weight status was observed in females. **Discussion**: Although some trends aligned with those from previous research, results in this cohort were ambiguous. Future research should continue to focus on the causal effects between critical growth periods and adulthood weight status to generate future intervention strategies to prevent adulthood obesity.

Effect of Acute Isometric Handgrip Exercise on Vascular Function in Children with Congenital Heart Disease

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Objective: Endothelium-dependent vasodilation measured through flow-mediated dilation (FMD), is thought to be impaired in individuals with congenital heart disease (CHD). Isometric handgrip (IHG) exercise is a proposed

intervention to improve vessel reactivity by optimizing shear stimuli in the arm to provoke changes in arterial diameter. Indeed, IHG training has been found to improve FMD in healthy adults and children. Whether IHG training improves endothelial dysfunction in children with CHD remains unknown. The effects of acute IHG exercise on the brachial artery were examined in children with CHD.
Hypothesis: We tested the hypothesis that acute IHG exercise would increase FMD in children with CHD.
Methods: Four subjects with CHD (mean, 13 ± 1 year, 3 female) completed a single session of 4 × 2 mins of acute IHG (30% maximum voluntary contraction using the right hand) with 1-min rest intervals between bouts. Before and after IHG exercise, the right brachial artery was imaged with Duplex ultrasound using a 1-min baseline, 5 mins of forearm circulatory occlusion, followed by 3 mins of cuff deflation. Blood pressure and heart rate were measured continuously.
Results: Pre-FMD (baseline) mean arterial pressure (pre: 102 ± 17 mmHg vs. post: 110 ± 16 mmHg, p = 0.496) and heart rate (pre: 75 ± 13 bpm vs. post: 66 ± 5 bpm, p = 0.253) were not different. Baseline brachial artery diameter increased following acute IHG in 3 of 4 subjects (pre: 3.11 ± 0.45 mm vs. post: 3.23 ± 0.39 mm, Cohen's d = 0.3). Peak shear rate was greater post-IHG in 3 of 4 subjects (pre: 995 ± 346 sec^{-1} vs. post: 1158 ± 501 sec^{-1}, Cohen's d = 0.4). FMD% (4.7% vs. 6.3% and 8.2% vs. 10.5%) and FMD% normalized to shear rate area under the curve (AUC) ratio (2.2E-5 vs. 7.4E-5 a.u. and 3.1E-5 vs. 4.3E-5 a.u., Cohen's d = 2.0) increased post-IHG in 2 of 4 subjects. When brachial artery diameter increased, peak shear rate, FMD%, and FMD% normalized to shear rate AUC improved post-IHG in 2/3 subjects whereas subject four showed a decrease in brachial artery diameter, FMD% and FMD% normalized to shear rate AUC, with the exception of peak shear rate post-IHG.
Conclusion: Favorable changes in brachial artery diameter, peak shear rate, FMD% and FMD% normalized to shear rate AUC following acute IHG may be a promising intervention for improving vascular tone and endothelial function in children with CHD.

The Impact of a Multi-setting Intervention on the Motor Competence of Children in Kindergarten and Grade One

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Introduction: Motor competence (MC) can be defined as an individual's ability to proficiently execute motor skills. High MC has been positively linked to children's physical activity levels. Previous MC interventions have generally targeted only one setting such as the school. However, multi-setting interventions tend to be more effective. Therefore, the purpose of this study was to assess the effectiveness of a 12-week home, school, and community-based motor development intervention on MC of kindergarten and grade one children.
Methods: Eight classrooms, in four schools from two Saskatchewan communities, matched for demographics, were assigned to receive the intervention (n=2 schools), or continue with their usual practice (n=2 schools; controls). The intervention included weekly motor development activities practiced with family at home, curricular-based motor development within physical education classes at school, and biweekly community activity nights. MC was assessed pre- and post-intervention in 103 intervention (41 female) and 83 control (36 female) children. An age-appropriate version of the PLAYfun tested motor development of 10 different fundamental motor skills in the movement domains of run, locomotor, object control, and balance. In addition, PLAYparent and PLAYcoach were used to assess differences at the home and school level, respectively. A MANOVA was used to evaluate the intervention effect with alpha set at $p<0.05$.
Results: Children in both the intervention and control groups significantly improved their overall MC post-intervention but children in the intervention group had a greater increase than controls ($p<0.05$). The changes in MC for both groups were specifically observed in the locomotor and object control domains ($p<0.05$). Control parents perceived their child's object control MC improved ($p<0.05$), while teachers of children in the intervention viewed their student's balance, object control, locomotor, and total MC improved ($p<0.05$). Group differences in PLAYfun favoured children in the intervention for run, skip, gallop, kick, and balance ($p<0.05$) post-intervention. While children in the control group had higher MC for jump post-intervention ($p<0.05$). There were no groups differences in MC for PLAYparent ($p>0.05$). Finally control teachers scored their students MC higher than intervention teachers at baseline ($p<0.05$).

Conclusion: A 12-week multi-setting intervention was found to improve the MC of kindergarten and grade one children.

Teachers' Perspectives on Implementing Movement Integration: A Job-Embedded Professional Development Intervention and Evaluation

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Introduction Movement integration (MI) is a tool that can be used in schools to help promote additional physical activity opportunities for children and youth. MI is associated with numerous positive outcomes related to physical activity, behaviour, and learning. However implementation of MI in classrooms is low among elementary school teachers.
Purpose This study investigated the perceptions of 12 elementary school teachers involved in a job-embedded professional development (JEPD) intervention for MI. JEPD is evidence-based, professional development that takes place directly in the classroom for teachers during instructional time.
Methods A one-phase model of an embedded mixed methods study design was utilized to combine both qualitative and quantitative data together into a summative process evaluation. Post-intervention surveys (qualitative and quantitative), memoing (qualitative), and informal conversations (qualitative) were included in the process evaluation and analyzed using grounded theory. The post-intervention survey was administered one month later and assessed quantity of MI sessions and confidence and competence to use MI. Questions about the benefits and challenges teachers' experienced from the intervention were also examined. The intervention component occurred over three weeks (three intervention visits/participant).
Results Pre-intervention interview data demonstrated barriers to MI (e.g. time, space, confidence, and competence), envisioned MI strategies (e.g. new resources and strategies), and reasons for having a movement educator for MI (another perspective and teacher learning). At post-intervention there was a statistically significant increase in teachers self-reported MI use ($Z = -2.138$, $p = 0.0165$, $r = 0.6$), improved confidence ($p = 0.048$), and a strong, positive correlation between confidence and competence. Teacher's perspectives about the intervention were categorized into six themes: (a) employable strategies, (b) increased student engagement, (c) value of additional support, (d) environmental and institutional barriers, (e) recall and transitioning back to sedentary learning, and (f) increasing intervention length.
Conclusion JEPD was effective for supporting teachers and addressing common barriers associated with implementing MI in the classroom. Qualitative findings provided insight to teachers' varied perspectives associated with JEPD for MI including benefits, challenges, and future recommendations for MI trainings. The variables that may lead to the success of professional development for MI and positively impact MI implementation may include valued MI strategies by teachers including different movement activities for classroom spaces and grades, as well as student engagement, and additional support.

Nursing initiated protocol for the management of dehydration in the pediatric emergency setting: A quality improvement initiative

Dr. Joshua Emery and Dr. Ben Thomson

Introduction: Dehydration is a common presenting complaint in the pediatric emergency, with most managed using oral rehydration therapy (ORT). Multiple studies suggest that implementation of nursing-initiated protocols for ORT and ondansetron in the emergency department decreased the use of IV fluid and decreased length of hospital stay. Currently, our tertiary pediatric center has no such protocols in place.
Aim: To create a standardized nursing-initiated pathway for administration of ORT and ondansetron without a physician's order in Children's Emergency Services (CES). We obtained qualitative feedback from physicians and nurses, and measured pathway use. Presenting complaint, presenting diagnosis and need for IV fluid resuscitation were also determined.
Methods: Evidence for ORT pathways and use of ondansetron were reviewed in collaboration with The Canadian Agency of Drugs and Technologies in Health (CADTH). Ethics exemption was granted by the Research Ethics Board. We worked with pharmacy to create a medical directive allowing nurses to administer ondansetron without a

physician's order. Dehydration was assessed using the Gorelick score. A clinical pathway was created to guide initial nursing management of patients at risk of dehydration. Pathway and ondansetron use were measured over a 5-month period by charge nurses after each shift. Charts were reviewed retrospectively to determine outcomes.
Results: Forty-one children received ORT or ondansetron. Fifty-one percent of participants were male with an average age of 4.19 years. Thirty-seven patients (90.4%) received both ORT and ondansetron. Vomiting was the most common presenting complaint (82.9%). Viral gastroenteritis was the most common discharge diagnosis (63.4%). Two patients did not receive ORT due to other presentations (concussion and appendicitis). Two patients did not present with symptoms requiring ondansetron. Three patients (7.3%) received IV fluid in the ED. Of these, only one received a bolus secondary dehydration refractory to ORT. Most qualitative feedback from nursing and physicians was positive, with many commenting on the pathway improving flow and providing better symptom management.
Discussion/ Conclusion: A nursing-initiated protocol for ORT and ondansetron without a physician's order in the pediatric emergency department was successfully implemented. Vomiting was the most common presentation for patients receiving oral fluid challenges. One patient out of 41 receiving ORT required IV fluid secondary to failure of ORT. General perceptions from nurses and physicians were positive with implementation of this pathway.
Future directions: Additional input from patients about their satisfaction around earlier symptom management would aid in getting additional nursing directives implemented in our department.

Innovations in Postgraduate Medical Education: Using Remote Presence Robotic Technology in a Multidisciplinary Simulation Program

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Introduction: In our community hospital setting, remote presence robotic technology (RPRT) has been used for pediatric intensivist consultation, and experiences from such cases have shaped its implementation in a multidisciplinary simulation program.
Case Description: We present a case series at a community hospital where RPRT was used for pediatric intensivist consultations. In these consultations, RPRT was used for a variety of functions, including leadership of acute resuscitation, breaking difficult news, and for initiating discussions regarding end-of-life care. Given the important role that RPRT held in these cases, it was translated into use for a multi-disciplinary, postgraduate trainee-led simulation program.
Discussion: Although the medical contexts of the cases differ, the versatility of RPRT demonstrates the importance of this medium for remote pediatric intensivist consultation. The variety of roles that RPRT utilization can have in clinical management also makes it attractive for postgraduate medical education and multi-disciplinary team learning. RPRT use in a multi-disciplinary, postgraduate trainee-led simulation program is increasing provider familiarity with RPRT in a practice environment, helping guide multi-disciplinary team learning, and underlines the importance of telemedicine in medical education.
Conclusion: The use of RPRT as described in our case series as well as its implementation in a multidisciplinary, postgraduate trainee-led simulation program emphasize the importance of telemedicine in pediatric care. The implementation of RPRT in the described simulation program provides a framework that could be adapted for other purposes in medical education.

DRIED BLOOD SPOT (DBS) TEST FOR HBA1C MEASUREMENT IN PEDIATRIC DIABETES CARE IN SASKATCHEWAN

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Background: Glycated hemoglobin (HbA1c) is a representation of a patient's serum glucose over approximately 3 months and is a common method used for diagnosis, monitoring and screening of pediatric type 1 and 2 diabetes. However, the frequency of HbA1c testing required (3-4 times per year), remote laboratory access, poor weather and transportation conditions, needle poke fear, and most recently COVID19 laboratory restrictions and public concern

regarding accessing healthcare institutions, all impede timely, consistent access to HbA1c testing. The dried blood spot (DBS) card is a novel method for measuring HbA1c, allowing patients to collect small volumes of blood through a self-initiated, at-home capillary sample; these cards can be mailed into the lab for analysis and reporting. DBS cards for HbA1c measurement have been validated in the adult population, but there is no current pediatric data to support their use.

Aim: This study's aim is to validate the use of DBS cards to measure HbA1c levels compared to the standard approach of a venous HbA1c as well as to identify potential barriers to implementing this novel method provincially secondary to time (processing) and transportation factors.

Methods: Venous and dried blood spot card samples were collected simultaneously from 59 patients. Venous samples were collected as per routine laboratory protocols and processed at specific laboratories across Saskatchewan; capillary samples were collected by patients upon presentation to their local laboratory by using basic written instructions with pictorials and DBS cards. Samples were time stamped and mailed between the community laboratories and the Saskatchewan provincial laboratory for single-site DBS card analysis and reporting. Correlation analyses will be conducted to assess inter-assay agreement (Bland-Altman plot, Lin concordance correlation, and Pearson correlation). The feasibility of DBS collection and processing will be assessed based on timing, processing, and transportation of samples.

Results/Discussion: Data collection is complete as of March 2022. Preliminary results will be available for the presentation. Based on our review of the current literature and our preliminary data, we are expecting the DBS HbA1c to correlate reasonably strongly with the venous HbA1c result. The novelty of this study is that the use of DBS cards to measure HbA1c levels has never been validated within the pediatric population. If validated, this model would be used in the next phase of research to be assessed as a screening tool for type 2 diabetes in remote and underserved populations.

Thank you

Our Presenters

Our Judges

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