UNIVERSITY OF ALBERTA

PEDIATRIC RESEARCH DAY

April 17th, 2024

ABSTRACTS

When citing abstracts presented at Pediatric Research Day, please consider using the following format:

<Author names>. <Abstract title>. <Oral or poster presentation>. <Page number>. Presented at Pediatric Research Day (April 17, 2024). Department of Pediatrics, Faculty of Medicine & Dentistry, College of Health Sciences, University of Alberta, Edmonton, AB, Canada.

For example:

Alexander RT, Grimbly C. The impact of renal health on overall health-related quality of life in children and adolescents. Poster presentation. Page 12. Presented at Pediatric Research Day (April 17, 2024). Department of Pediatrics, Faculty of Medicine & Dentistry, College of Health Sciences, University of Alberta, Edmonton, AB, Canada.

Schedule of the day:

Time	Description	Room		Time	Description	Room
10:00 - 11:15 AM	Poster Viewing + Judging	Prairie / Aurora				
11:15 - 11:30 AM	Welcome + Introductions	Maple Leaf				
3 minutes	Welcome /Land Acknowledgement/Opening Remarks	Dr. Ball / Dr. Grimbly				
	Welcome from FoMD/Intro Dr. Davidge	Dr. Todd Alexander				
	Welcome from WCHRI	Dr. Sandra Davidge				
	Enjoy the Day	Dr. Ball / Dr. Grimbly				
11:30 - 12:30 PM	**Residents (Pediatrics) x 6**	**Maple Leaf**		**11:30 - 12:30 PM**	**Graduate Students Session #1 x 6**	**Glacier**
11:30-11:40	Asha Hollis			11:30-11:40	Rebecca Zafrani	
11:40-11:50	Katharine Jensen			11:40-11:50	Danielle Lysak	
11:50-12:00	Nikki Mitchell			11:50-12:00	Dalal Alzaid	
12:00-12:10	Dinesh Dharel			12:00-12:10	Nazanin Arjomand Fard	
12:10-12:20	Elizabeth Ziming Yan			12:10-12:20	Paul Lerner	
12:20-12:30	Linlei Ye			12:20-12:30	Si Ning Liu	
12:30 - 1:00 PM	Lunch + Poster Viewing	Maple Leaf / Prairie / Aurora		12:30 - 1:00 PM	Lunch + Poster Viewing	Maple Leaf / Prairie / Aurora
1:00 - 2:00 PM	**Dr. Deena Hinshaw Keynote**	**Maple Leaf**		**1:00 - 2:00 PM**	**Dr. Deena Hinshaw Keynote**	**Maple Leaf**
2:00 - 2:15 PM	Break / Poster Viewing	Maple Leaf / Prairie / Aurora		2:00 - 2:15 PM	Break / Poster Viewing	Maple Leaf / Prairie / Aurora
2:15 - 3:15 PM	**Residents (Sub Specialty) x 6**	**Maple Leaf**		**2:15 - 3:15 PM**	**Junior Faculty + Fellows x 6**	**Glacier**
2:15-2:25	George Slim			2:15-2:25	Lotenna Kalu	
2:25-2:35	Paige Burgess			2:25-2:35	Osnat Wine	
2:35-2:45	Natasha Mense-Dietrich			2:35-2:45	Nicola Culliford-Semmens	
2:45-2:55	Amelie Cyr			2:45-2:55	Flavio Teixeira Vieira	
2:55-3:05	Mallory McNiven			2:55-3:05	Matthew Martens	
3:05-3:15	Andrew Mackie			3:05-3:15	Peter Yamoah	
3:15-3:20 PM	Transition	Maple Leaf / Prairie / Aurora		3:15-3:20 PM	Transition	Maple Leaf / Prairie / Aurora
3:25 - 4:15 PM	**Graduate Students Session #2 x 5**	**Maple Leaf**		**3:25 - 4:15 PM**	**Undergraduate Students x 5**	**Glacier**
3:25-3:35	Sabrin Bashar			3:25-3:35	Sela Scott	
3:35-3:45	Marwa Ramsie			3:35-3:45	Ida John	
3:45-3:55	Raj Somasundaram			3:45-3:55	Maria Ren	
3:55-4:05	Qiuyu Sun			3:55-4:05	Angela Hamie	
4:05-4:15	Juliana Lasso-Mendez			4:05-4:15	Ricky Liu	
4:15 - 4:20 PM	Transition	Maple Leaf / Prairie / Aurora		4:15 - 4:20 PM	Transition	Maple Leaf / Prairie / Aurora
4:20 - 4:30 PM	Closing Remarks / Prizes	Maple Leaf		4:20 - 4:30 PM	Closing Remarks / Prizes	Maple Leaf

Table of Contents

Qiuyu Sun, Cory S. Wagg, Nathan Wong, Liye Fang, John M. Seubert, Timo D. Müller, Gary D. Lopaschuk. ***Increasing ketone supply to the heart does not exert functional benefits in mice with heart failure with preserved ejection fraction (HFpEF)***

Introduction:
Heart failure with preserved ejection fraction (HFpEF) is a heterogenous and complex disease associated with many risk factors. Dramatic alterations of cardiac energy metabolism occur in HFpEF mice hearts, including a decrease in glucose oxidation and an increase in fatty acid oxidation. However, although oxidation of ketones is an important source of ATP it remains unclear how the heart oxidizes ketones in HFpEF. It is also unclear whether elevating ketone supply to the heart can improve cardiac energetics and/or provide functional benefit for the hearts in HFpEF. The goal of the study is to investigate the physiological and molecular effects of increasing ketone supply to the heart via ketone ester supplementation or SGLT2 inhibitor treatment.

Methods:
13-month-old C57BL/6N female mice were administered a 60% high fat diet and L-NAME (0.5g/L/day in the drinking water) to induce HFpEF. In parallel, two other groups of mice were maintained on the HFpEF protocol while also receiving either a ketone ester supplement (1-3 butanediol 1g/kg/day) or SGLT2 inhibitor (empagliflozin 10mg/kg/day) for 6 weeks. Cardiac function was assessed with transthoracic echocardiography prior to isolated working heart perfusions. Hearts were perfused with 5 mM glucose, 0.8 mM palmitate, 100 μU/ml insulin, at both low (0.6 mM) and high (1 mM) concentration of [3-^{14}C] β-hydroxybutyrate to quantitatively assess heart ketone oxidation rates.

Results:
Mice receiving HFpEF protocol showed accelerated weight gain, glucose intolerance, and elevated blood pressure. Cardiac %EF was preserved in HFpEF mice, but a worsening of diastolic function was seen. In isolated working control hearts, ketone oxidation rates significantly increased in response to higher concentration of β-hydroxybutyrate in the perfusate (0.6 mM vs 1mM) (from 861 ± 63 to 1377 ± 94 nmol·g dry wt^{-1}·min^{-1}). However, in HFpEF hearts, the increase in ketone oxidation rates was significantly decreased (from 707 ± 65 to 881 ± 115 nmol·g dry wt^{-1}·min^{-1}). This was associated with a decreased expression of the ketone oxidative enzyme succinyl-CoA:3-oxoacid CoA transferase (SCOT) in HFpEF hearts. While both ketone ester supplementation and SGLT2i treatment restored ketone oxidation rates in HFpEF hearts, this was not associated with an increased expression of SCOT, or with an improvement in cardiac function.

Conclusion:
Cardiac ketone oxidation is impaired in HFpEF. While increasing ketone supply to the heart restores cardiac ketone oxidation rates, this is not associated with improvements in cardiac function in HFpEF mice.

Vijay Anand, Angela Bates, Mohammed Al Aklabi, Amélie Cyr. ***Deep Sternal Infections in Pediatric Cardiac Surgical Patients with Delayed Sternal Closure Receiving Cephazolin Prophylaxis***

Introduction:
Delayed sternal closure can be an effective intervention to improve hemodynamics and ventilation after pediatric cardiac surgery1. However, delayed sternal closure is a known risk factor for sternal wound infections2. Consensus guidelines regarding peri-operative prophylaxis have been published, but more evidence is needed to support the use of ongoing antibiotics until the sternum is closed in terms of regimen choice and duration3. Our center introduced a practice change in January 2020 with respect to all pediatric cardiac surgical patients undergoing delayed sternal closure with the goal to decrease the incidence of deep sternal wound infections, including mediastinitis. This change included continuous intravenous Cefazolin (30 mg/kg/dose every 8 hours) until the sternum is closed as well as 2 additional doses after sternal closure, per our institution standard practice. This would allow for targeted antimicrobials to prevent infections from bacteria normally colonizing the skin, while not selecting out for more resistance bacteria or fungus. With this study, we aimed to compare the incidence rate of mediastinitis between patients who received Cefazolin until chest closure and those who only received the standard two doses post-operatively. Our hypothesis was that the incidence of deep sternal infectious would decrease with ongoing Cefazolin prophylaxis without an increase in morbidities such as resistant organisms and acute kidney injury.

Methods:
Retrospective, single-center, observational study in a pediatric Cardiac Critical Care Unit (PCICU) at a tertiary children's hospital.
Pediatric patients (younger than or equal to 18 years old) with delayed sternal closure after cardiac surgery between January 2018 and December 2021. We then compared

Results:
For patients having delayed sternal closure after cardiac surgery, we compared the rates of mediastinitis between patients who received Cefazolin until chest closure (after January 2020) and those who only received the standard two doses post-operatively (before January 2020). The rate of deep sternal infections in patients without continuous antibiotic prophylaxis was 4%, which was statistically significantly higher than in patients who received continuous antibiotic prophylaxis (1%).
Of note, full statistical analysis currently being completed.

Conclusions:
In this study, ongoing prophylaxis with Cefazolin until after sternal closure resulted in fewer rates of mediastinitis after cardiac surgery with delayed sternal closure. There was no increase in morbidities seen. Further randomized controlled studies are needed to establish the ideal antimicrobial regimen in terms of agent choice and dosage.

Morgan Morrissey, Patricia Kawada. ***Atypical presentation of HSD3B7 deficiency***

Introduction:
Bile acid synthesis disorders are the result of deficient activity of one of 17 enzymes required for conversion of cholesterol into bile acids. One such bile acid synthesis disorder is 3β-hydroxy-Δ5-C27-steroid oxidoreductase (HSD3B7) deficiency, an autosomal recessive inherited disorder caused by a defect in 3β-hydroxy-Δ5-C27-steroid dehydrogenase (C27 3β-HSD) enzyme. Ultimately, this bile acid synthesis disorder is due to a HSD3B7 gene mutation. With only 53 cases reported between 1993 and 2015, HSD3B7 deficiency is rare. Additionally, the existing literature is primarily in the form of case reports, with the majority of patients with HSD3B7 deficiency presenting in the neonatal period, often with cholestatic jaundice.

Methods:
Case report, chart review, and literature review.

Results:
11 year old male who initially presented to Pediatric Hematology with prolonged PTT
and INR in the context of recurrent epistaxis and easy bruising. Upon further work up, the patient was found to have low levels of vitamin K dependent factors, as well as low vitamin levels of A, D, and E. Additionally, the patient had elevation of AST, ALT, GGT, ALP, and total bilirubin. Normalization of the INR and PTT were achieved with vitamin K supplementation. Genetic testing was sent to work up the abnormal liver enzymes and revealed HSD3B7 deficiency. Fast atom bombardment ionization was subsequently completed and confirmed the diagnosis.

Conclusions:
There is limited clinical data available regarding HSD3B7 deficiency. The classic presentation of this bile acid synthesis disorder is in a neonate with cholestatic jaundice, hepatomegaly, fat-soluble vitamin deficiencies, and lipid malabsorption. Therefore, the initial presentation of an 11 year old with recurrent epistaxis and prolonged INR and PTT is thus an atypical presentation of HSD3B7 deficiency. This case report demonstrates that there is diversity in the age of presentation and accompanying signs and symptoms in HSD3B7 deficiency.

SANCHEZ, L. Fernando, PENAL, Alexandra, POPE, Elena. ***Prospective study to assess the utility and validity of a chromameter in the assessment of infantile hemangiomas.***

Introduction:
To date, there are no validated tools to objectively measure changes in infantile hemangiomas (IHs). Chromameter, designed to assess color differences and reflection is a potential objective tool to predict and monitor IH proliferation and involution.

Methods:
A single-center prospective cohort study was conducted in Toronto, Ontario, Canada (SickKids) from 2019-2022 to evaluate the utility, validity and responsiveness to change of Chromameter CR-400 (Konica Minolta®) in quantifying the evolution of IHs. Statistical analyses included means, standard deviations (SD), or medians and interquartile ranges for non-normally distributed data. Correlation coefficients (Spearman rho, Cronbach alpha, ICC) were used to show reproducibility, validity, and responsiveness to change. A p-value <0.05 indicates statistical significance.

Results:
This study included 34 infants [mean age-3.8 (SD=1.35) months], mostly females (84%). IHs were small [mean size=2.6 (SD=1.9) cm], uncomplicated, and superficial (88%), affecting the face and trunk. 60% received treatment; 85% systemic and 15% topical. Redness was analyzed using a 100 mm visual analog scale (VAS) (0 normal–100 intense red).

The correlation between the chromameter and VAS scoring was not statistically significant (Adj. R2=0.155, p=0.317). Inter-rater and intra-rater consistency was statistically significant, showing ICC scores of 0.96 [95%CI:0.93–0.98] and 0.95 [95%CI:0.90–0.97], respectively. Correlation coefficients scores denoted a strong, and positive correlation at baseline [Spearman r(34) =0.633, p =0.000; Cronbach alpha 4 items; α=0.98], and at follow-up [Spearman r(21) =-0.275, p=0.226; Cronbach alpha 3 items; α= 0.88]. Responsiveness to change scores were VAS -0.6 [mean VAS=–13.85 (SD=22.84)], ΔE -3.55 [mean ΔE=–21.90 (SD=5.91)], and Δa -1.15 [mean Δa=–1.6 (SD=1.39)].

The chromameter was considered easy and safe to use by parents and investigators.

Conclusions:
The chromameter is safe, fast, and reliable for assessing IH proliferation, and can potentially aid in treatment decision algorithms, and monitoring treatment response.

Samina Ali, Maala Bhatt, Serge Gouin, Scott Sawyer, Antonia Stang, Maryna Yaskina, Patricia Candelaria, Anna Heath, Petros Pechlivanoglou, Terry Klassen, Martin Offringa, Amy Drendel, Serena Hickes, Naveen Poonai. ***Non-steroidal or opioid analgesia for children with acute musculoskeletal injuries: the No OUCH trials***

Introduction:
Musculoskeletal (MSK) injury is associated with moderate to severe pain in most children. While ibuprofen is recommended as first-line therapy for children's mild-moderate MSK pain, optimal management for more severe pain remains unclear, especially when considering family concerns surrounding opioids.

Methods:
Using a novel preference-informed complementary trial design, we conducted 2 simultaneous randomized, double-blind, controlled trials. Children 6-17 years, presenting to one of six Canadian pediatric emergency departments with an acute MSK injury (<24 hours) of a single limb and a verbal numerical rating scale (vNRS) score >5/10 were recruited from April 2019 to March 2023. Our primary objective was to determine the effectiveness of a combination of oral opioid and non-opioid analgesic medications [ibuprofen (IBU-10mg/kg) + acetaminophen (ACET-15mg/kg); IBU (10mg/kg) + hydromorphone (HM-0.05mg/kg); IBU (10mg/kg) alone]. The primary outcome was self-reported vNRS score at 60 minutes.

Results:
A total of 699 children were randomized and 653 were included in the primary analyses (IBU+ACET=295, IBU+HM=110, IBU alone=294). Mean (SD) age was 11.5 (3.5) years, 47.4% (331/699) were female, and initial mean (SD) vNRS score was 6.4 (1.8); demographic characteristics were similar across the three study groups. The most frequent injury location was the upper limb 43.3%, 302/698). Mean (SD) vNRS scores 60 minutes post drug administration were 4.6 (2.4) IBU+ACET, 4.8 (2.6) IBU+HM, and 4.6 (2.3) for IBU alone. Mean (SD) pain reduction at 60 minutes was -1.9 (2.2) IBU+ACET, -1.7 (2.1) IBU+HM, and -1.8 (1.9) for IBU alone. Mean (SD) pain reduction at 120 minutes was -2.0 (2.4) IBU+ACET, -1.6 (2.2) IBU+HM, and -2.0 (2.3) for IBU alone. Proportions of children achieving a VNRS <3 were 19.9%, 23.4%, and 19.3% for IBU+ACET, IBU+HM, and IBU alone. The proportion of children achieving a vNRS score reduction of >2 were 53.0%, 55.1%, and 51.3% for IBU+ACET, IBU+HM, and IBU alone. Adverse events occurred most frequently in IBU+HM (28.2%) compared to IBU+ACET (6.1%) and IBU alone (6.1%). No serious adverse events occurred.

Conclusion:
Combining ibuprofen with either acetaminophen or hydromorphone did not provide better analgesia than ibuprofen alone for children with an MSK injury. Adverse events were over 4-fold more frequent with hydromorphone use. These trials' results do not endorse adding oral hydromorphone or acetaminophen to ibuprofen for moderate-severe MSK injury pain in children.

Dalaal Alzaid, Florence Birru, Deborah Olmstead, Joanna MacLean. ***Long-term non-invasive ventilation in Children with Central Nervous System Disorders-A Systematic Review Protocol***

Introduction:
Long-term non-invasive ventilation is a common treatment for sleep-related breathing disorders in children. Children with central nervous system disorders often experience sleep-related breathing disorders, particularly congenital or acquired brain injuries and respiratory control disorders. These conditions can lead to respiratory challenges due to pharyngeal muscle dysfunction, resulting in obstructive sleep apnea or gas exchange disruption due to impaired carbon dioxide and oxygen sensing. Although non-invasive ventilation has demonstrated benefits in improving respiratory function and quality of life in various medical conditions, its effectiveness for children with central nervous system disorders remains uncertain.
Objective:
To assess the impact of non-invasive ventilation on mortality rate, hospitalization duration, respiratory function, sleep quality, quality of life, and adherence in children with central nervous system disorders.

Methods:
This systematic review will be an extension of a scoping review conducted on long-term non-invasive ventilation in children. The scoping review's search strategy utilized Medical Subject Headings (MeSH) and free-text terms for "child" and "non-invasive ventilation." It included human studies published since 1990 and searched across various databases, including MEDLINE, Embase, CINAHL, and Cochrane Library. The results of the scoping review will be searched for studies on children with central nervous system disorders using long-term non-invasive ventilation. All study designs will be included, and reference lists will be reviewed for relevant articles. We will include children aged 0-18 years with nervous system disorders receiving non-invasive ventilation via a mask interface but exclude those using non-invasive ventilation only in acute care settings.

Results:
The last update of the scoping review included 473 articles. The preliminary review of titles and abstracts identified 15 articles referencing central nervous system disorders within broader discussions of non-invasive ventilation. Among these 15 articles, three studies were specifically focused on children with cerebral palsy, neurocognitive deficits, and neurodevelopmental deficits, respectively. After reviewing their findings, they emphasized the need to explore the use of non-invasive ventilation in this population.

Conclusion:
The protocol will prioritize studies exploring non-invasive ventilation in children with central nervous system disorders. However, the preliminary review revealed that some articles mention these disorders within the text rather than in the abstract. This makes it difficult to exclude studies during abstract review, which may highlight the need for further research in this area.

Nazanin Arjomand Fard, Michael Bording-Jorgensen, Christopher Cheng, Katie Kerr, Harmol Aujla1, Sarah Mansour, Wael Elhenawy, Troy Perry, Eytan Wine. ***Exploring the Role of Klebsiella variicola and Klebsiella pneumoniae in Pediatric Ulcerative Colitis Pathogenesis***

Introduction:
Recent studies indicated that Klebsiella (K) pneumoniae (isolated from the stool of IBD patients) and K. variicola (isolated from the mesenteric tissue of Crohn disease patients) have the potential to induce inflammation in epithelial and preadipocyte cells, exacerbating colitis in murine models. We isolated these strains from pediatric ulcerative colitis (UC) patients' appendix (relevant to UC pathogenesis given the protective effects of appendectomy) and other non-inflamed colon sections. We hypothesized that these isolates are invasive and induce inflammation in UC. These strains have not been previously studied in UC.

Methods:
K. variicola and K. pneumoniae were isolated from two pediatric UC patients' appendices and other non-inflamed colon sections and identified using 16S DNA Sanger sequencing. Virulence of the two strains was determined by infecting Caco2 cell lines and performing adhesion and invasion assays, quantifying biofilm formation, and assessing barrier functions using transepithelial electrical resistance (TEER) measurement. Importantly, we monitored the production of pro-inflammatory (e.g., IL-8, TNF-α) and anti-inflammatory (IL-10) cytokines using reverse transcriptase quantitative polymerase chain reaction (RT-qPCR).

Results:
K. variicola and K. pneumoniae exhibited high levels of biofilm formation compared to adherent-invasive Escherichia coli (AIEC), which are commonly isolated from IBD patients. Furthermore, the Klebsiella strains adhered to epithelial cells within 2-3 hours post infection. TEER experiments showed compromised barrier integrity after 6 hours and overnight infection. Except for K. pneumoniae isolated from the ascending colon, the tested strains exhibited a significant increase in IL-8 expression. Similarly, K. variicola from the peri-appendicular region demonstrated elevated TNF-α gene expression.

Conclusions:
K. variicola and K. pneumoniae isolated from UC patients have the potential to form biofilms, disrupt barrier integrity, and trigger inflammatory responses. These findings unravel a potential role for pathogenic Klebsiella strains in driving UC pathogenesis. Importantly, these data shed light on the role of appendix-associated bacteria in the development of UC. Future work includes using comparative genomics to map the virulence determinants of these bacteria.

Khorasaniha R, Tollenaar S, Jovel J, Ba I, Voisin A, Miller R, Mahmood R, Bording-Jorgensen M, Cheng C, Bernstein CN, Knox N, Bar-Or A, Marrie RA, Yeh EA, Zhao Y, Banwell B, Waubant E, Zhu F, Mirza AI, Karimi-Abdolrezaee S, Tremlett H, McGregor K, Willing B, Armstrong H. ***Unfermented dietary β-fructan fibres worsen multiple sclerosis outcomes, mediated by altered gut microbiota***

Introduction:
Dietary fibres are not digested in the gut; they are fermented by microbes, typically promoting health. We showed that if fibre fermenting microbes are decreased, specific unfermented fibres (β-fructans) can induce inflammation and gut damage in inflammatory bowel diseases (IBD). This occurred via TLR2 and the NLRP3 inflammasome, increasing cytokine secretion (eg. IL-1β, IL-23, IL-5). Similar to IBD, some multiple sclerosis (MS) patients display changes in their gut microbiota and worsened symptoms and quality of life scores following a high-fibre diet. We hypothesize unfermented β-fructans induce inflammation in MS, mediated by decreased fibre-fermenting gut microbiota in select children with MS.

Methods:
Study I: Stool samples were collected along with participant diet data (Block Kids Food Screener) from the Canadian Pediatric Demyelinating Disease Network (n=45 MS, n=52 healthy controls; <22 years age and sex matched) at a single time point. We calculated approximate daily fibre subtype intakes. Gut microbiota abundance and functions were determined (shotgun metagenomics; Kraken2 and HUMAnN3) and correlated with fibre consumption between patients and controls. Study II: Direct response to unfermented β-fructans was examined in a germ-free EAE mouse model of MS (unable to ferment fibres). EAE and non-EAE control mice were fed β-fructans (n=11EAE, n=8cont) or control fibre diet (n=12EAE; n=6cont) beginning at symptom onset (day 14) until 29 days. EAE scores and weights were recorded daily. Intestinal and CNS tissues were collected (day 28) and paraffin embedded to examine inflammation and demyelinating lesions (LFB-HE, H&E).

Results:
Study I: Children and youth with MS consumed significantly less β-fructans (2.4g/day; S.D. 0.32; $p<0.05$) than healthy participants (3.6g/day; S.D. 0.39) which was associated with altered gut microbiota, reflecting decreased fibre fermenting abilities (taxonomic and metabolic). Study II: Unfermented β-fructans sustained worsened EAE symptoms in mice following symptom peak (day 20-28; $p<0.05$) and increased demyelinating lesions in the CNS, compared to control diet only in EAE.

Conclusions:
Results from Study II where unfermented β-fructans sustained worsened symptoms and MS specific CNS damage in mice supported Study I findings that decreased fibre fermenting microbiota was associated with decreased β-fructan consumption in MS patients. Perhaps this is a learned behavior related to β-fructan intolerance and avoidance. It is possible personalized dietary fibre guidelines reducing consumption of detrimental fibres and increasing consumption of safe fibres could improve outcomes in MS.

Asha Hollis, Simone Lebeuf, Kate Storey. ***miyo-mahcihoyān: Exploring how indigenous youth perceive vaping and its risks***

Introduction:
Vaping and e-cigarette use among youth in Canada is common. 34% of youth in grades 7 to 12 report having tried e-cigarettes. Vaping consequences for youth are serious and can include nicotine addiction, respiratory disorder exacerbation, and impaired brain development. However, 48% of youth believe occasional vaping has little to no risk. Data show that Indigenous youth have similar or higher rates of vaping or e-cigarette use, and it is known that tobacco has a cultural significance among Indigenous populations. There is a paucity of resources for youth, including Indigenous youth, on vaping risks. Indigenous youth feel existing resources are not contextually relevant for them and are thus not effective in terms of prevention. This research aims to (1) better understand perspectives of First Nations youth on initiation and use of e-cigarettes, and (2) to obtain feedback on an educational program on vaping risks, HeartSmartSOLVE, to understand how it can be modified to address needs and cultural context of First Nations youth.

Methods:
All research will be done with the Alexander Research Committee (ARC), a community university partnership. This research is grounded in participatory approaches and methods will be qualitative in nature. Data generation will occur through talking circles with youth, where traditional customs will be respected. Inclusion criteria will be students in grades 7 to 12 who attend Kipohtakaw Education Centre in the community of Alexander First Nation. Students will participate in a first talking circle, during which conversation will be guided to discuss perspectives on youth vaping, including but not limited to reasons to initiate vaping, and any cultural significance given the role of tobacco in First Nations traditions. Participants will then be asked to complete a freely available vaping risks education program, HeartSmartSOLVE. Lastly, participants will return for a second talking circle to discuss their impression of the program and suggestions on how the program could be modified to be more culturally relevant to First Nations youth. Conversation from the talking circles will be analyzed in collaboration with Alexander First Nation's youth and discussed with the ARC. Meaningful components will be identified and grouped into themes for content analysis.

Results/Conclusion:
This research is ongoing and data has not yet been collected. Overall, this research will help fill the knowledge gap of First Nation youth perspectives on vaping, and take steps towards developing effective educational programs on vaping to address the needs and culture of Indigenous youth.

Bishoi Aziz, Reza Belaghi, Hien Huynh, Kevan Jacobson, Jennifer DeBruyn, David Mack, Anthony Otley, Anne Griffiths, Thomas Walters, Eytan Wine. ***Neutrophil-to-lymphocyte ratio at diagnosis predicts colonoscopic activity in pediatric inflammatory bowel diseases (pIBD)***

Introduction:
Neutrophil-to-lymphocyte ratio (NLR) reflects systemic immune response and has been recently identified as a potential biomarker for several autoimmune conditions. NLR predicts disease activity in adults with inflammatory bowel diseases (IBD) but had not been studied in pediatric IBD.
Aims: investigate the link between NLR and baseline colonoscopic disease activity in UC and CD, the need for surgery or admission, and one-year therapies response in UC and CD in children.

Methods:
Pediatric IBD patients were prospectively enrolled into the CIDsCaNN database [Canada-wide inception cohort for pediatric patients with inflammatory bowel diseases]. The cohort included patients diagnosed between 2003–2022 based on ileocolonoscopy, histopathology, and established diagnostic criteria. Demographic, clinical, and biochemical data were recorded in the database. Patients were excluded from the analysis if they have other conditions affecting NLR, such as neoplasms and autoimmune diseases, or if their labs were missing. Endoscopic disease activity was assessed using the Mayo endoscopic score (MES; dichotomized as low (0, 1) or high activity (2, 3)) in UC and SES-CD score (as continuous variable) in CD.
Stata/IC 17.0 was used for statistical analysis. Logistic regression was used to test the link between predictors and binary outcomes. Simple linear regression was used to analyze the relationship between continuous variables.

Results:
576 UC and 1076 CD patients <18 years old were included. In UC, NLR at the time of diagnosis was significantly associated with MES activity in the diagnostic colonoscopy in both univariate and multivariable logistic regression (multivariable OR= 1.45, 95% CI= 1.06 – 1.99, p= 0.019). In CD, NLR was significantly correlated with SES-CD score in univariate and multivariable simple linear regression (multivariable coefficient= 1.41, 95% CI= 0.65 – 2.16, t= 3.68, p<0.0001). NLR did not predict surgery, need for admission, nor any of the therapy responses in either UC or CD.

Conclusion:
Pediatric IBD patients with higher NLR at baseline had a higher disease activity on endoscopy. This establishes the significance of NLR as a non-invasive biomarker to help direct the clinical decision making. This is potentially due to the role of neutrophils, as an innate immunity cell, in the acute stage of inflammation.

Sabrin Bashar, Hein M Tun, Piushkumar Mandhane, Theo J. Moraes, Elinor Simons, Stuart Turvey, Padmaja Subbarao, James Scott, Anita Kozyrskyj. ***Effect of postnatal hospital length-of-stay on gut microbiota and subsequent food sensitization in vaginally-delivered infants without maternal intrapartum antibiotic exposure***

Introduction:
Microbial markers in infancy found as predictive indicators for food sensitization with certain markers demonstrating correlation with prolonged hospital length-of-stay (LOS) in early infancy. This study aimed to investigate the association between postnatal prolonged LOS in vaginally delivered (VD) infants, infant gut microbial composition at 3-and 12-months, and its influence on food sensitivity at 1-and 3-years of age.

Methods: A cohort of 633 vaginally born infants without maternal intrapartum antibiotic (IAP) exposure from the Canadian Healthy Infant Longitudinal Development (CHILD) Cohort Study was analyzed. Infant gut microbiota was assessed using Illumina 16S rRNA sequencing of fecal samples collected at 3-and 12-months. The gut microbial profiles of infants hospitalized for >1 day were compared with those of infants with shorter hospital stays based on the median value of LOS. Associations between hospital LOS, gut microbiota composition, and food (egg, peanut, milk and soy) sensitization at 1-and 3-years were evaluated using logistic regression and mediation analyses.

Results:
At 3 months, infants with prolonged hospitalization exhibited depletion of commensal bacteria Bacteroides in VD infants (p=0.03). As IAP has effect on infant gut microbiota maturation we selected VD infants without maternal IAP exposure to investigate the effect of LOS on gut microbiota. In VD infants without maternal IAP exposure, a longer LOS was associated with higher abundances of hospital acquired infection causing bacteria Enterococcus (aOR 1.41, 95% CI 1.04-1.93) and Citrobacter (aOR 1.42, 95% CI 1.04-1.94) at 3-month and lower abundance of Bacteroidaceae (aOR 0.74, 95% CI 0.54-1.01) at 3 and 12-months. We did not observe any association between LOS and food sensitization in logistic regression model both at 1 year (aOR 0.79, 95% CI 0.47-1.36) and 3 years (aOR 1.41, 95% CI 0.62-3.2). Interestingly, mediation analysis revealed a significant role of higher Enterococcus abundance in early life and lower Bacteroidaceae abundance in later infancy in the pathway from LOS to food sensitization at 1 year (mean difference 0.01, bootstrap 95% CI 0.0004-0.026) with no observed association at 3 years.

Conclusions: In conclusion, postnatal prolonged exposure to the hospital microbial environment may lead to an overrepresentation of pathogenic bacteria and depletion of beneficial microbiota, ultimately contributing to food sensitization in later life.
Funded by: Canadian Institute of Health Research (CIHR); the Allergy, Genes, and Environment (AllerGen) Network of Centres of Excellence; and the Women and Children's Health Research Institute (WCHRI) graduate program.

Paige Burgess, Jonathan Duff. ***The impact of guided mental rehearsal in screen-based simulation upon leadership skills in pediatric resuscitation***

Introduction:
A wide range of simulation modalities are utilized in medical education (Ziv et al., 2003). Although there are few well-designed trials comparing different simulation modalities (Cook, 2005), full-mission simulation has been shown to foster leadership skills more effectively than other modalities (Owen et al., 2006). Unfortunately, full-mission simulation is not always accessible to medical trainees as it is resource intensive (Kurrek & Devitt, 1997). Screen-based simulation is a promising potential solution.
Mental practice, defined as mental rehearsal of an activity without gross muscular movements, enhances the acquisition of technical skills (Gabbott et al., 2020; Snelgrove & Gabbott, 2020). Emerging evidence suggests mental practice promotes communication and leadership skills in team-based resuscitation (Lorello et al., 2016). Our study aims to assess the impact that mental rehearsal has upon leadership skills in pediatric resuscitation when incorporated into a screen-based simulation interface.

Methods:
This is a randomized control trial of General Pediatrics residents. Participants will be randomized to one of three groups. Each group will complete two clinical cases in the training phase, which will be limited to 1 hour across training modalities.
Group 1: Computer-based training
Participants manage a patient resuscitation via a computer interface. Afterwards, they review a video of an identical case with a practitioner modelling ideal leadership skills. Positive leadership skills will be outlined following the video.
Group 2: Computer-based training with mental rehearsal
Participants manage a patient resuscitation via a computer interface. At various points, they will be guided through mental rehearsal of the patient resuscitation.
Group 3: Full-mission simulation
Participants lead a simulated patient resuscitation in a full-mission lab. Each case is followed by a traditional debrief using the PEARLS framework (Bajaj et al., 2018). The debrief will emphasize leadership skills.
The evaluation phase will occur 2-4 weeks following the training phase. All participants will complete two full-mission simulation evaluation cases. One case will be identical to a training case to evaluate skill retention. The second case will be a novel case to evaluate skill transfer. All scenarios will be recorded for evaluation by two assessors. Performances will be scored using a modified CALM (Concise Assessment of Leader Management) assessment tool.
CALM scores will be compared between intervention groups. A sub-analysis of the retention case scores and the transfer case scores between intervention groups will be completed.

Results: Not available; study ongoing.

Biqi Chen, Matthew W. Carroll, Jordan Carroll, Daniela M. Isaac, Rabin Persad, Jason Silverman, Ella Gay, Justine Turner. ***Pediatric GI Specialized Training and Resource (STAR) Program: a pilot virtual educational program for pediatric disorders of gut-brain interaction***

Introduction:
Disorders of gut-brain interaction (DGBI, previously known as functional gastrointestinal disorders) are common conditions affecting more than a quarter of all children globally. Patients with these disorders have reduced quality of life and suffer from increased anxiety, depression, sleep problems and school absenteeism. DGBIs can impact the entire family and are costly and resource intensive conditions to treat. Currently, minimal education is provided on DGBIs during medical training. Many primary health care providers including family physicians and pediatricians may feel ill-equipped to diagnose and manage these disorders. Yet, children with DGBIs can be safely managed in the community without need for gastroenterology referral and expensive tertiary level investigations, like endoscopy. Our goal was to develop an online resource to deliver education on common pediatric DGBIs to provide community physicians with the knowledge to confidently diagnose and manage these conditions in the medical home.

Methods:
We designed an online educational program focused on pediatric DGBIs comprising of eight on-demand case-based modules presented by pediatric gastroenterologists at the Stollery Children's Hospital. The website was launched July 2023, and advertised to pediatricians, family physicians and learners (pediatric residents and medical students). Users completed pre- and post-module knowledge questionnaires and we solicited feedback for future quality improvement. Participants rated the perceived overall impact of each training video on a Likert scale from 1-5, with 5 most positive.

Results:
Between July 2023 to February 2024, over 70 individuals (including physicians and trainees) have registered for access to modules. However, the number of users who have viewed/completed the modules remain low (module 1, 'Approach to DGBI', n=8; module 2, 'Abdominal Migraine', n=4; modules 3-8, n=1 for each). At this time the knowledge gained for each module cannot be analyzed based on the low number of participants. However, overall feedback was positive (average score of 5 for all modules) and all users indicated they would recommend the program to their colleagues.

Conclusion:
Initial feedback from participants of our educational program has been quite positive. Future directions include website improvement and understanding the impacts of this program on referral burden to pediatric GI over time. Given apparent high interest (registration), but low completion of learning modules, it is imperative to understand the constraints faced by clinicians using this learning approach and to modify accordingly.

Nicola Culliford-Semmens, Angela McBrien, Lisa Hornberger, Leila Rittey, Luke Eckersley. ***Atrial strain in fetal cardiomyopathy is reduced compared to controls***

Introduction:
Atrial function is important to augment ventricular filling and is a predictor of mortality in adult heart failure with both preserved and reduced ejection fraction. Diastolic dysfunction predicts outcome in fetal cardiomyopathy (CM), however there is little data on atrial function in this group. The aim of this study was to characterize atrial function in fetuses with CM.

Methods:
Fetuses with CM (excluding associated congenital heart disease or primary arrhythmia) were identified from existing databases. The first abnormal (n=18) and last (n=13) fetal echocardiograms with suitable imaging (a clear 4 chamber clip at >50 frames per second) were analyzed. Left (LA) and right atrial (RA) strain analysis was conducted. Fetuses with CM were compared to healthy fetal controls (n=37).

Results:
Fetal CM subtypes were dilated (5, 28%), hypertrophic (1, 6%), restrictive (2, 11%), non-compaction (3, 17%), left ventricular aneurysm (2, 11%) and mixed (5, 28%). Clinical outcomes were alive (6, 33%), death (5, 28%), transplant (2, 11%), fetal demise (1, 6%), termination of pregnancy (3, 17%) and ongoing pregnancy (1, 6%).
Left ventricular fractional shortening was reduced in 10 (56%) and right in 13 (72%). Cardiovascular profile score was abnormal in 14/15 (93%) where calculated.
LA reservoir function was significantly reduced in fetal CM at initial study, with reduction in LA peak reservoir strain and strain rate. LA diastolic strain was also significantly reduced. RA reservoir function was significantly reduced; however, RA diastolic strain rate was similar to controls. Follow-up study and change in strain variable analysis suggested similar findings, although numbers were limited.

Conclusions:
Fetuses with CM had significantly reduced LA and RA reservoir and LA diastolic function compared to controls. This may be of prognostic importance in assessment of fetal cardiac function and response to therapy. Analysis of atrial pump function and atrial and ventricular function interaction in this group is planned.

Samantha Cyrkot, Lisa Hartling, Shannon Scott, Sarah Elliott. ***Parents' user experience accessing and utilizing a web-based map of COVID-19 recommendations for health decision making: a qualitative study***

Introduction:
The eCOVID19 Recommendations Map & Gateway to Contextualization (RecMap) website was developed to identify all Coronavirus Disease 2019 (COVID-19) guidelines, assess the credibility and trustworthiness of the guidelines, and make recommendations understandable to various stakeholder groups. To date, little has been done to understand and explore 1) where parents look for COVID-19 health information and why, 2) parents' user experience when accessing and utilizing the RecMap website to make health decisions, and 3) what knowledge mobilization activities are needed to increase parents' awareness, use and engagement with the RecMap website.

Methods:
We conducted a qualitative descriptive study, utilizing semi-structured interviews and a think-aloud activity with parents of children under 18 years living in Canada. Participants were asked to provide feedback on the RecMap website and to "think-aloud" as they navigated the website to find relevant COVID-19 health recommendations. Demographic information was collected using an online questionnaire. A hybrid deductive/inductive thematic approach guided analysis and data were synthesized into themes and sub-themes.

Results:
Twenty-one participants (n=13 [62%] mothers) were interviewed and participated in a think-aloud activity. Parents primarily used the internet to find COVID-19 information and focused on sources that they determined to be credible, trustworthy, simple and engaging. As the pandemic evolved, participants' information seeking-behaviors changed, particularly related to their topics of interest and search frequency. Most parents were not aware of the RecMap website prior to this study but found satisfaction with its concept and layout, and expressed intentions to use and share it with others. Parents experienced some barriers to utilizing the RecMap website and suggested key areas for improvement to facilitate usability and perceived usefulness. Recommendations included a more user-friendly home page for lay audiences (e.g. separate public-facing user-interface), improving the search/filter options, quicker navigation, clearer titles, more family-friendly graphics and improving mobile-friendly access. Several approaches and strategies to disseminate the RecMap website were also expressed, including a mix of traditional (e.g. handouts) and non-traditional (e.g. social media) methods in credible and high traffic locations that parents frequent often.

Conclusions:
Overall, parents liked the concept of the RecMap website, but had some suggestions to improve its usability especially related to language, navigation and website interface. These findings can be used to improve the RecMap website for parents and offers insight for the development and dissemination of effective web-based health information tools and resources for the general public.

H.Davidson, L.Lin, A.McBrien, L.Hornberger. ***Determining antenatal risk factors for progression and outcome of atrioventricular valve regurgitation in patients with atrioventricular septal defect***

Introduction:
Atrioventricular valve regurgitation (AVVR) affects morbidity and mortality in patients with atrioventricular septal defects (AVSD). There is limited literature on the frequency and progression of AVVR through gestation. Our aim was to review the incidence of fetal AVVR, the progression in fetal life as well as in the perinatal transition and whether fetal AVVR was associated with adverse outcomes.

Methods:
A single center retrospective review of fetuses with AVSD between 2007-2023. Medical records and fetal echocardiograms (echo) were reviewed. AVVR was categorized as none, mild, moderate or severe on colour Doppler. Hemodynamically significant AVVR progression was defined as those from none or mild to ≥ moderate or moderate to severe. AVVR severity was compared from the first to last fetal echo and the last fetal to the first postnatal echo.

Results:
Of 211 AVSD, 129 with fetal echo and outcome data for review were included in the analyses, with 75 terminations of pregnancy, 7 lost to follow up not included. Of the 129, 56(43%) had unbalanced AVSD and 73(57%) balanced AVSD and 42(33%) had heterotaxy. Mean gestational age at first fetal echo was 24 (12-33) and last 35 (19-39) weeks. Of the 129, 120(93%) had no-mild AVVR at initial study, 6(5%) moderate and 3(2%) severe AVVR. Most (93/101, 92%) with AVVR demonstrated no significant change in AVVR severity through gestation. Eight (8%) had significant progression of AVVR severity with 5 progressing from none-mild to > moderate AVVR and 3 from moderate to severe. AVVR severity and progression was not associated with ventricular imbalance, heterotaxy or genetic diagnosis. AVVR severity at last fetal echo correlated well with initial postnatal echo in the majority (99/105, 94%). There were 5 who had no AVVR antenatally that had ≥ moderate AVVR after birth. Moderate-severe AVVR was associated with worse outcome ($p = 0.002$). Of 6 fetuses with severe AVVR antenatally, 2 suffered an intrauterine fetal demise, 3 early postnatal deaths (< 1 month) and only 1 survived post neonatal heart transplant.

Conclusions:
The majority of fetuses with AVSD demonstrate no significant AVVR or AVVR development/progression through gestation and in the perinatal transition. AVVR severity and progression in fetal AVSD does not correlate with ventricular imbalance, heterotaxy or genetic diagnosis. Severe AVVR is associated with poor fetal and neonatal outcomes.

Dinesh Dharel, Matthew Hicks. ***Prevalence, acute-care resource utilization, and cost of inpatient care for infants with neonatal opioid withdrawal syndrome born in Alberta***

Introduction:
The increasing occurrence of Neonatal Opioid Withdrawal Syndrome (NOWS) and the associated prolonged use of expensive specialized neonatal care beds represent societal costs on top of the neurobiological harm culminating from Canada's drastically increasing opioid crisis. At the verge of a province-wide hospital-level transition from traditional to 'Rooming in' model of care for NOWS, this study explores the historical pattern of its prevalence and acute-care resource utilization over time and across different regions in Alberta. Specifically, we seek to describe the trends in acute-care length of stay, rates of emergency department visits and readmission within 30 days of discharge, and the cost of inpatient care for infants born in Alberta with fetal exposure to opioids.

Methods:
This retrospective study is based on data collected for the NASCENT (Neonatal Abstinence Syndrome Mother-Baby Care ImprovEmeNT) dashboard using provincial-level administrative databases for infants with NOWS born in Alberta from 1 January 2012 to 31 December 2022. Prevalence of NOWS, presented per 1000 live births, is calculated using ICD-10-CA codes P96.1 or P04.4 from the Canadian Institute for Health Information Discharge Abstract Database at index hospitalization before discharge home from any acute care hospitals in Alberta. The length of acute care hospitalization in days is calculated for neonatal intensive care unit (NICU) and non-NICU beds. The rate of filled morphine prescriptions, emergency department visits, and readmission to any acute care beds on day seven and day 30 from the initial discharge home, along with the cost of inpatient care of the infants with NOWS, further describes the pattern of acute care resource utilization for NOWS. Descriptive statistics and the 95% confidence interval for the estimates will be presented in relevant visualizations using Tableau.

Results:
The initial results demonstrate the overall increasing trend in the prevalence of NOWS from 2012 to 2022, with variability across different quarters and years and among different zones within the province. The variability is observed in the distribution of length of NICU and non-NICU stay over time and space and in emergency department visits and readmission rates. The nuanced analysis, including the cost and the visualizations using Tableau, is in progress.

Conclusion:
As a complement to the prospective study (Alberta NASCENT program) aimed to reduce NICU length of stay through scaling up hospital-level NOWS intervention in Alberta, our findings describe the historical baseline trend of prevalence and acute-care resource utilization for infants with NOWS that will inform tailored programming within the province.

Sarah A Elliott, Sholeh Rahman, Shannon D. Scott, William Craig, Lisa Knisley, Kathleen Shearer, Lisa Hartling. ***Seeking care for children with intellectual and/or developmental disabilities in the emergency department: a mixed methods systematic review***

Introduction:
The management of children with intellectual and/or developmental disabilities (IDDs) in the emergency department (ED) is increasingly recognized as complex and challenging for families and health care providers. As these challenges continue to be documented, a deeper understanding of how parents and caregivers navigate the ED experience and what their information needs are is warranted. The objective of this review was to explore parents' experiences and information needs regarding management of their child with an IDD in the ED.

Methods:
We searched six electronic databases and grey literature to identify primary studies in English published since 2000. We synthesized quantitative and qualitative outcome data simultaneously using a convergent integrated approach and used a mixed-methods appraisal tool to assess methodological quality of the included studies.

Results:
Seven studies from nine articles were included (3 qualitative, 3 quantitative, 1 mixed method). Four main themes related to parents' self-reported experiences were identified: 1) appropriateness of the ED to manage and support their child; 2) acknowledgement/recognition of their child's IDD and incorporation of those considerations into overall care and management; 3) managing and navigating the ED environment; and 4) decision to disclose their child's condition when visiting the ED. While parents acknowledged that the ED may not be the optimal place to take their child, they were often unsure where else to seek care and support during a crisis, or when the child is acutely ill. Parents want to work in partnership with ED staff to support their child's care needs, but are unsure as to whether to disclose their child's diagnosis. Parents felt there was a lack of educational resources to support both ED staff and parents navigate an ED visit, and wanted improved communication in the ED around waiting times. Two articles provided data relevant to information needs, highlighting parents' desire to have resources supporting ED orientation and access to services within and outside of the ED setting.

Conclusions:
From the limited number of studies, it was evident parents wanted better communication with healthcare providers, and a greater understanding by ED staff around physical space settings needed to support their child. Resources supporting ED staff and parents to communicate effectively and work together can ensure children with IDDs care needs are met. Further research into understanding parents' experiences and information needs related to managing a child with an IDD in the ED is needed to guide the development of effective resources.

George Slim, Lucy Harris, Christopher Spence, Manisha Bharadia, Jody Gingrich, Melissa Flaro, Lloyd Flaro, Carolina A Escudero, Edythe B Tham. ***The Impact of a Fontan Family Camp on Children and their Families***

Introduction:
Congenital heart disease (CHD) affects 1 in 100 live births, with the functionally univentricular heart being a rare manifestation (5 in 10,000 births). Fontan surgery, the culmination of a three-stage palliative process, presents unique challenges, and despite improved outcomes, long-term uncertainties persist. The children with a Fontan circulation face not only medical complexities but also psychosocial issues. The Virtual Heart Connection, initiated during the pandemic, addressed these challenges using a virtual platform. Recognizing the need for in-person connections, the Western Canada Fontan Family Camp was introduced. Our study evaluates its impact on children with a Fontan procedure and their families.

Methods:
We engaged families via a physician-led in-person weekend camp. Rooted in inclusivity, diverse activities addressing medical, psychological, and transitional care were included. The holistic agenda, including specialist-led educational sessions and breakout groups, outdoor activities, and mental health support, exemplified the commitment to multifaceted interventions. An anonymous evaluation assessed participant satisfaction and perceived benefits.

Results:
Engaging 18 children with Fontan procedure, 17 siblings, and 29 caregivers, the camp received positive feedback from 33 evaluations. Satisfaction levels were high, with 89% rating the event as "well-organized", 96% reported increased connection to other families and 100% willingness to attend subsequent camps. Psychologist-led mental health sessions and transition-nurse specialist's workshops received positive feedback, with comments including “It was fantastic to learn new things about the transition, what to look out for in the future and learning the different ways to get ahead” and “I thought it was really cool how they brought that to the camp. It helps breakdown the negative stigma around mental health and started some good conversations”.

Conclusion:
The Western Canada Fontan Family Camp provided a framework for family support by addressing medical, psychological, and transitional care. The study pioneers a qualitative framework, integrating medical expertise, psychological support, and creative workshops. The Holistic Camp Agenda, featuring Q&A sessions and psychological support, ensured a comprehensive approach. A unanimous willingness to attend subsequent camps highlighted the perceived impact and value. This framework lays a foundation for family-centered empowerment programs in congenital heart disease.

Angela Hamie, Lavinia Ionescu, Maryna Yaskina, Seema Mital, Bethany J. Foster, Allen Upton, Robert Ingham, Simon Urschel. ***Immune maturation and childhood transplantation: impact of age, organ, thymus excision and immunosuppression on lymphocyte populations.***

Introduction:
Solid organ transplantation (SOT) is a life-saving therapeutic option for children facing end-stage organ failure. We hypothesized that the composition of the adaptive immune system in childhood transplantation (Tx) is affected by age, organ, thymus excision and immunosuppression, thereby impacting the clinical outcomes of Tx.

Methods:
In a national mutli-center collaboration (CNTRP-POSITIVE), we included children listed for heart, lung and kidney solid organ Tx. Peripheral blood mononuclear cells (PBMC) were isolated from pre-transplant, 3-month, and 12-month post-Tx blood samples. Characterization of the adaptive immune system was determined by flow cytometric deep phenotyping and stimulation assays grouped by stages of immune maturation (0-2; 2-10 and 10-18 years of age).

Results:
123 children had baseline samples with collection at 3-month in 89 and 12 months in 69. Patients receiving heart (n=33), or liver (n=41) Tx were younger than those receiving kidney (n=57). The CD4+ T cell count decreased significantly at 3 months post-Tx compared to baseline levels, most pronounced in infants ($p<0.001$). A recovery of CD4 levels to baseline at 12 months was observed in kidney and liver recipients, but not in heart recipients ($p <0001$). In contrast, regulatory T cells increased 3 months post-Tx ($p= 0.0126$), returning to baseline at 12 months ($p= 0.8337$). CD19 B cells remained similar post-Tx with the exception of a significant decrease in frequency by 12 months post-Tx in the < 2 years age group ($p < 0001$). Transitional B cells showed a decrease by 3 months post-Tx in Kidney recipients, while they increased in heart recipients ($p = 0.0584$) Thymoglobulin (ATG) induction therapy had a profound persistent effect on T but also B-cells while the less aggressive basiliximab did not affect immune maturation.

Conclusion:
Thymus excision during or before heart Tx results in a persistent inability to recover CD4 counts at 12 months post-Tx, unlike in kidney and liver recipients. Infants (< 2 years) show the strongest effect of Tx on CD4 T cell and B cell populations. The increase in Tregs at 3 months post-transplant across all variables supports their role in balancing an exaggerated immune response, leading to an equilibrium state by 12 months post-Tx. Aggressive induction with ATG results in extensive and persistent alteration of the lymphocyte composition, while transitional B cells were reduced after basiliximab treatment. Future efforts will assess the impact of these changes on clinical outcomes, ultimately advancing optimization of patient treatment.

Mandi Gray, Kira Dlusskaya, Richard Oster, Rick Lightning, Barbara Dumigan-Jackson, Azure Johnson, Josh Lightning, Larry Listener, Bonny Graham, Maxine Cutarm, Alyssa Chappell, Andrew S. Mackie. ***Barriers and Supports for Indigenous Youth with Pediatric Onset Chronic Health Conditions Transitioning from Pediatric to Adult Healthcare: A Qualitative Study***

Introduction:
This study examined the experiences of Indigenous youth with pediatric onset chronic health conditions who had or were about to transition from pediatric to adult healthcare services. Transition is often a lengthy process which ideally begins around age 12-13 and continues until the mid-20s. There is a growing body of literature on healthcare services transitions for youth, but there is an absence of literature on Indigenous youth.

Methods:
The research was done in collaboration with a Community Advisory Committee comprised of Indigenous healthcare providers, Elders and knowledge keepers and guided by a community based participatory research methodology. Qualitative interviews (n=47) were conducted with Indigenous youth, caregivers, and healthcare providers. There were three talking circles (n=15). The transcripts were coded thematically

Results:
The thematic findings include: 1) systemic inequalities exacerbate gaps in healthcare; 2) intergenerational trauma created unique barriers for Indigenous youth; 3) long-term relationships with care providers as a protective factor; 4) the incorporation of Indigenous worldviews into healthcare services to aid transition; 5) new responsibilities as an adult. The participants provided recommendations to improve healthcare service delivery including the need for Indigenous transition supports in community and improving education for healthcare practitioners about transition and Indigenous worldviews.

Conclusions:
This study demonstrates the complexity of older Indigenous youth with pediatric onset chronic health conditions transition experiences. The identified barriers could be addressed through systems level changes and the development of Indigenous specific transition support services. Such approaches need to be Indigenous-led and incorporate Indigenous culture, language, and teachings.

Andrew S. Mackie, Mia Tulli-Shah, Alyssa Chappell1, Michael Kariwo, Siciida Ibrahim, Bukola Salami. ***Barriers and Facilitators to Transition from Pediatric to Adult Healthcare for Immigrant Youth with Chronic Health Conditions***

Introduction:
Little is known about the experiences of immigrant youth living with chronic health conditions in Canada regarding their transition from pediatric to adult health care.

Methods:
We conducted semi-structured individual interviews and focus groups with 20 youth, 14 parents/caregivers, and five service providers across Canada. Youth were 1st or 2nd generation immigrants to Canada, aged 16-25, with pediatric-onset chronic health conditions. Parents or caregivers were 1st generation immigrants to Canada, having children with chronic health conditions. Health service providers delivered health care or other services to immigrant populations. Thematic analysis was conducted of all interviews and focus group transcripts.

Results:
Most participants described health care transition as very difficult to navigate. Two major themes emerged across participant narratives: 1. Barriers to transition: lack of family experience in Canada, language, discrimination, financial strain, stigma, and long wait times. Some of these barriers are specific to newcomer families, but others are generalizable to the Canadian population. 2. Facilitators of transition: youth independence, youth acting as cultural bridges within their families, and cross-sector support between health care, education, social work and settlement services.

Conclusions:
Immigrant youth and their families face a broad range of barriers to health care transition. The collaborative nature of cross-sector support effectively addressed some of the barriers faced by newcomer families. Clinicians should provide immigrant youth and their families with accessible information about the health condition and how to navigate the adult healthcare system prior to transfer, particularly when language barriers exist.

Katharine V. Jensen, Andrea Morrison, Maryna Yaskina, Manasi Rajagopal, Keon Ma, Patricia Candelaria, Shannon Scott, and Samina Ali. ***Low caregiver health literacy is associated with non-urgent use of Canadian pediatric emergency departments***

Introduction:
Health literacy is defined as a set of skills needed to effectively function in a health care setting. In American pediatric emergency departments (PEDs), the prevalence of low health literacy among caregivers is approximately 50%. Caregivers with lower health literacy are more likely to overestimate severity of illness, overutilize health care resources, and have poor adherence with health-promoting behaviours such as medication compliance and vaccination.
Objectives: Our primary objective was to relate caregiver health literacy to PED utilization with a focus on whether the presentation was considered urgent or non-urgent. The secondary objective was to explore the relationship between social, demographic, and child characteristics as they relate to urgent versus non-urgent PED utilization.

Methods:
This was a sub-study of a descriptive cross-sectional survey with medical record review. Data were collected from ten Canadian PEDs from October 2018 to March 2020. Study variables included child and caregiver demographics, PED visit details, and the Newest Vital Sign measurement of caregiver health literacy (categorized as low or adequate). PED visits were classified as urgent or non-urgent based on the resource utilization method. Logistic regression modeling was used to ascertain effects of specific variables on the urgency of PED utilization.

Results:
There were 1957 caregiver respondents. Response rate was 97.6% (1957/2005). Mean (SD) caregiver age was 37.0 (7.7) years, 74.3% (1449/1950) were mothers, 72.6% (1417/1953) spoke English as a primary language, 51.0% (993/1946) had a university degree, and 45.1% (766/1699) had a household income > $100,000. There was caregiver representation from six different provinces. The mean (SD) age of the children was 5.9 (5.0) years and 48.1% (940/1956) were female. 43.7% (885/1957) of caregivers had low health literacy. Being a caregiver with a child < 2 years [aOR 1.83 (1.35, 2.48)] and low health literacy [aOR 1.56 (1.18, 2.05)] were associated with greater non-urgent PED use.

Conclusion:
Almost half of caregivers presenting to Canadian PEDs have low health literacy, which may limit their ability to make appropriate healthcare decisions for their children. Low caregiver health literacy is a modifiable factor associated with increased non-urgent PED utilization; efforts to address these factors may positively impact PED utilization.

Ida John, Julie Nguyen, Wayne Clark, Sarah Forgie, Marghalara Rashid. ***Elders and Leadership's Perception of Developing an Indigenous Curriculum for Postgraduate Programs.***

Introduction:
Indigenous peoples face unique challenges related to accessing and interfacing with the healthcare system and the portrayal of their cultures using a deficit-based lens in medical training. Health inequities exist due to a history of colonization leading to discriminatory practices, unjust laws, and economic and political disadvantages. Culturally safe practice requires self-reflection around power, privilege, racism, and educational practices using a critical thinking lens, and trainees and care providers may be ill-equipped. Healthcare users are looking for healthier outcomes, improved relationships, and greater representation of Indigenous people.

Methods:
A grounded theory approach for organizing and interpreting our data. The conversational method such as open-ended, semi-structured interview questions was used to prompt conversation with the study participants for interviews. Purposeful sampling was used to recruit leadership and community partners (n=17) and Indigenous Elders/Elder support (n=4). Data was transcribed and subsequently entered as verbatim transcripts into N-VIVO software (Qualitative Solutions Research, Melbourne, Australia) to facilitate data management and analysis.

Result:
Our analysis revealed the following categories: 1) Faculty development must be in place for teaching Indigenous Health, 2) Factors that leadership should consider for developing successful Indigenous initiatives, 3) Proper compensation to be given for Indigenous curriculum-related activities, 4) Programs to consider increasing Indigenous representation, and 5) Promoting Indigenous approaches in clinical practice and education.

Conclusions:
Data may be utilized to inform support and strategies to optimize the training and skills required for residents to work with Indigenous patients.

Lotenna E. Kalu, Georg Schmoelzer, Brenda Law, Dianna Wang, Eduard Eksteen, Julia Giesen. ***Assessing of the use of bedside Fibreoptic Endoscopic Evaluation of Swallowing (FEES) in a level three neonatal intensive care unit; a retrospective cohort.***

Introduction:
Newer ultrathin fibreoptic bronchoscopes have made it possible for Flexible fibreoptic bronchoscopy (FFB) to be done in the neonatal intensive care unit (NICU). Common FFB indications include extubation failure and suspected airway abnormalities.
Furthermore, bedside Flexible Endoscopic Evaluation of the Swallow (FEES) allows clinicians to evaluate swallowing in neonates while avoiding the radiation of Video Fluoroscopic Swallowing Exam (VFFS). Achieving oral feeding is an important developmental milestone for neonates, impacted by lung disease, ongoing respiratory support, brain injury, and airway conditions. There is limited data on bedside FFB in the NICU, with almost no data on FEES. We describe neonates who underwent FEES in a level 3 NICU to explore the uses and safety profile of this procedure.

Methods:
This was a retrospective case series of all infants admitted to the Philip C. Etches NICU who had documented FEES from January 2022 to August 2023. Hospital records were reviewed for clinical data including weight, gestational age, respiratory support, indications for and results of FEES, adverse events during procedure, need for VFFS, and contribution of FEES findings to patient management.

Results:
47 infants with a median (IQR) birth gestational age (GA) of 30.6 weeks (26.6-37.2) and median (IQR) birth weight 1540g (800-2910g) were included. Infants were mostly preterm (34% extremely preterm, 19.1% very preterm, 8.5% moderate / late preterm); the rest were term infants with hypoxic ischemic encephalopathy, congenital stridor, or aneuploidies. The most common co-morbidities were apnea of prematurity (40.4%) and bronchopulmonary dysplasia (31.9%). Infants had their first FEES performed at a median GA of 39.2 weeks. Only 27.7% were on full oral feeds at the time of the procedure. 57.4% of infants were on non-invasive respiratory support during the procedure; rest were in room air. The most common indications for FEES were persistent reliance on non-invasive respiratory support (36.1%) and stridor (29.7%). There were no significant adverse events. VFFS was done in 19.1%. Following FEES, half (53.2%) had continuation of current feeding plan. Commencement of oral feeds was advised in 6.3% and oral feeds were deemed unsafe in 10.6%. 6.4% had silent aspirations. Almost half (48.9 %) were diagnosed with structural anomalies ranging from mild subglottic edema or laryngomalacia to severe glossoptosis or subglottic stenosis. 8.5% went on to have a surgical airway procedure.

Conclusion:
Bedside FEES is a safe and effective tool for swallowing assessment and diagnosis of upper airway anomalies in the NICU.

Ezra B. Ketema, Muhammad Ahsan, Kaya Persad, Qiuyu Sun, Liyan Zhang, Gary D. Lopaschuk. ***SIRT2 Inhibition Decreases Glycolysis and Attenuates Hypertrophic Response in H9c2 Cardiomyocytes.***

Introduction:
Myocardial glycolysis increases in hypertrophic and failing hearts. Hyperacetylation also occurs in the failing heart, and many glycolytic enzymes are known to be subject to acetylation. However, it is generally considered that acetylation has inhibitory effects on glycolysis. As a result, it is not clear whether acetylation changes directly contribute to glycolysis changes in cardiac hypertrophy. We therefore determined whether changes in the acetylation of glycolytic enzymes and the activity of the cytosolic deacetylase SIRT2 regulate cardiac glycolysis.

Methods:
Glycolysis rates were directly measured in rat heart-derived H9c2 cardiomyocytes perfused with 5 mM [5-3H] glucose, 0.8 mM palmitate, and 4% bovine serum albumin. Before these metabolic measurements, H9c2 cells were treated with either a SIRT2 inhibitor (10 μM AGK2) or a vehicle for 24 hours. In separate experiments, SIRT2 was also knocked down in H9c2 cells using siRNA, followed by glycolysis rate determinations. The impact of SIRT2 inhibition or SIRT2 knockdown on acetylation status of glycolytic enzyme was also assessed. Furthermore, the effects of SIRT2 inhibition on hypertrophic signalling were assessed by treating H9c2 cells with phenylephrine.

Results:
SIRT2 inhibition markedly decreased glycolysis rates in H9c2 cells compared to vehicle-treated cells (524±108 vs 2631±372 nmol.g dry wt-1.min-1, $p<0.05$). Similarly, SIRT2 knockdown resulted in a significant reduction in glycolysis rates compared to scrambled siRNA-treated H9c2 cells (745±31 vs 1659±168 nmol.g dry wt-1.min-1, $p<0.05$). The decrease in SIRT2 was accompanied by an increase in the acetylation status of the glycolytic enzyme glyceraldehyde phosphate dehydrogenase (GPDH). Moreover, a trend towards increased phosphofructokinase (PFK) acetylation was also observed in SIRT2 knockdown H9c2 cells compared to scrambled siRNA-treated cells. Lastly, AGK2 treatment also attenuated phenylephrine-mediated hypertrophic responses in H9c2 cells.

Conclusions:
Increased acetylation of glycolytic enzymes is associated with a decrease in glycolysis, and SIRT2 inhibition or deletion in H9c2 cells significantly decreases glycolysis rates and attenuates hypertrophy. SIRT2 may therefore contribute to the increased glycolysis seen in hypertrophy and heart failure.

Joseph Kirk, Marghalara Rashid, Karen Forbes, Simone Lebeuf. ***Medical Student Distress and Communication challenges with adolescent patients***

Introduction:
Clinical clerkship provides opportunities for undergraduate medical students to put their classroom learning into practice with rotations in core medical disciplines, including pediatrics. However, the transition from classroom-based learning to clinical practice can bring challenges particularly around communication with patients. Encounters with adolescent patients and their families can be especially hard to navigate. Balancing professional obligations of confidentiality with family-centered care can also be difficult. In addition, many topics within Adolescent health can be challenging to discuss, including sexually transmitted infections, substance use, contraception, sexuality, gender identity and adolescent pregnancy. Transitioning to clinical rotations combined with the complexity of the adolescent interview can be potentially distressing to learners. In order to further understand this experience, we aim to answer three key questions: what are students' lived experiences with communicating with adolescent patients during their pediatric rotation? What aspects of communication with adolescents and their families do undergraduate students find challenging or distressing? And are there potential areas for improving medical student confidence within the undergraduate medical education curriculum?

Methods:
A qualitative research approach using hermeneutic phenomenology will be used to focus on the shared lived experience of medical students and the primary researcher. Within this phenomenological analysis a constructivism theoretical paradigm will further guide the research to help understand multiple social constructions of knowledge. In order to implement this design, purposeful sampling of information rich participants was sought by selecting from University of Alberta medical students who have completed their pediatric clerkship. Recruitment is completely voluntary. Participants who agree to participate undergo individual semi-structured interviews (30-60 min each). Interviews are then transcribed and reviewed for thematic identification. Rigor was further increased through memoing, peer debriefing, and member checking.

Results/Conclusions:
Initial thematic analysis is underway, and at this time several transcripts have been collected and initial themes are being identified. Expected outcomes based on the unique topics included in an adolescent interview and prior research reported poor integration of sexual history discussion and mood questioning, we anticipate that this evaluation will likely identify several topics of the adolescent interview that are particularly distressing to medical learners, which subsequently leads to lower rates of integration into regular interviews. The identification of areas which increased distress and the opportunity to discuss these areas will therefore inform future intentions to help ease these discussions and improve comfort by medical students at the University of Alberta with adolescent histories.

LAKUSTA, Charles, SZELEWICKI, Jonas, SURESH Sneha, PECHEUX, Lucie. ***Admission for Febrile Neutropenia in pediatric oncology patients prior to, and during the COVID-19 pandemic: a single center impact study.***

Introduction:
Febrile Neutropenia (FN) is a common, serious, and expensive complication in children with cancer undergoing chemotherapy. Despite current diagnostic resources, causative pathogens are only identified in 30-50% of FN episodes and among these, approximately 50% and 30% are respectively due to bacteria or virus. Respiratory viral infections in FN episodes are less well described than bacterial and fungal infections but its impacts on quality of life and costs have been recognized. Respiratory viruses became a worldwide focus during the COVID-19 pandemic, and the Alberta Government implemented Public Health Measures (PHM) including mandatory school and business closure, mask wearing, and social isolation attempting to stop its spread. Our study seeks to determine the impact of the pandemic and PHM on the incidence, etiology, and severity of FN admissions at the Stollery Children's Hospital.

Methods:
We conducted a retrospective single center study comparing pre-pandemic FN admissions in children receiving chemotherapy during three years prior to the COVID-19 pandemic (03/2017-03/2020 – pre-pandemic cohort) and during the first wave of the pandemic, before access to specific vaccinations (03/2020-03/2021 – pandemic cohort). Epidemiologic and clinical data were collected from charts. Severity of FN episodes was characterized by hospital length of stay (LOS), and risk-stratified using a previously validated score.

Results:
A total of 212 admissions for FN in 135 children with cancer were included. The pre-pandemic and pandemic cohorts were statistically similar in terms of gender, age, type of cancer, number of siblings, and type of central line. There were 174 admissions for FN over 3 years in the pre-pandemic, compared to 38 admissions in the pandemic cohort which represents a 35% decrease in FN admissions. While incidence of FN of unknow origin were similar in the two cohorts, the number of viral infections was significantly lower in the pandemic era ($p=0.005$) with 50% less virus identified than expected during this period and no influenza and par-influenza. Only two patients were diagnosed with COVID-19 infection and recovered. Interestingly, the number of bacterial infections was proportionally higher than expected in the pandemic cohort, and less Gram-negative bacilli and more coagulase negative Staphylococcus were identified. There was no intensive care admission during the pandemic. Incidence of high-risk scores at presentation and LOS where not statistically different in the two groups.

Conclusions:
Our results suggests that the COVID-19 pandemic related PMH significantly impacted the incidence and the etiology of FN admission among children with cancer.

Courtney Larsen. ***Pediatric NIV use at end of life: Implications of palliative care involvement and illness trajectory categories for goals of care***

Introduction:
Advances in technology and medical care as well as a shift in societal expectations have led to an increase in survival of children with a wide range of conditions who require breathing support. Non-invasive ventilation (NIV) through a mask outside the airway has become the gold standard option for home breathing support, and previous reports have shown a shift towards its use in more medically complex pediatric patients. This study aims to analyze the relationship between illness trajectories, involvement of the palliative care team, and changes in goals of care (GOC) over time in children initiated on home NIV who died of a life-limiting disease.

Methods:
A retrospective chart review was conducted using the following inclusion criteria: 1) Children 0-18 years; 2) initiated on home NIV through the Stollery's Pediatric NIV program; and 3) who died of a life-limiting condition between March 2012 and February 2021. Subjects were categorized by illness trajectory as defined by the Association for Children's Palliative Care and the Royal College of Paediatrics and Child Health.

Results:
Fifty-three children were included in the analyses (45% females); 19% were under the age of 2.0 years at time of death. While there were no differences in GOC by illness trajectories, involvement of palliative care was associated with a change in goals of care from the time of NIV initiation to time of death towards less invasive interventions ($p < .05$).

Conclusions:
This study points to the importance of helping patients and families navigate meaningful conversations regarding goals of care and overall care philosophy in children with potentially life-limiting conditions who need NIV to support their breathing. As demonstrated in this study, the palliative care team can be a facilitator of a deeper understanding of goals of care and how they change over time, which is required to ensure the child still benefits from NIV rather than simply prolonging life and increasing treatment burden.

Juliana Lasso-Mendez, Margie H. Davenport, Shauna Littlefair, Brendan Haughian, Nicholas Cheung, Christy-Lynn Cooke, Lily Lin and Lisa K. Hornberger. ***Maternal Heart Disease is Associated with Altered Ventricular-Arterial Coupling in the Midtrimester of Pregnancy***

Introduction:
Maternal heart disease (MHD) affects 4% of all pregnancies and is associated with increased maternal and fetal complications. Although some have proposed cardiac dysfunction to contribute to complications, not all MHD pregnancies have significant cardiac pathology suggesting that other factors could be contributory. Vascular pathology is observed in non-pregnant HD populations and in complicated pregnancies without HD. In the present study we examine ventricular-arterial coupling (VAC), which incorporates both vascular load and ventricular (LV) efficiency, and cardiac function in MHD and control participants and explore their relationships with the utero-placental-fetal circulation.

Methods:
Participants with and without HD were recruited between 18-24 gestational weeks matching maternal age, pre-pregnancy body mass index and body surface area. Metrics of cardiovascular function including VAC, cardiac output (CO), LV ejection fraction (LVEF) and global longitudinal strain (systolic function) and E/E' (diastolic function) were obtained by transthoracic echocardiography. VAC was calculated as arterial elastance/end-systolic elastance using LV volumes and LVEF, blood pressure and the preejection/total systolic period. Fetal biometry and Doppler-based uterine (UtA) and umbilical (UA) artery pulsatility indices (PI) were assessed by fetal echocardiography with comparisons made in centiles. Depending on normality of distribution, independent samples t-test or Mann-Whitney U statistical test were used to compare outcomes between MHD and control participants. One-way ANOVA or a Kruskal-Wallis test were used to compare outcomes between severity of HD (mild or moderate-severe) and controls.

Results:
We recruited 33 MHD (20.0±1.2 weeks) and 32 control (21.5±1.6 weeks) pregnancies. Maternal heart rate and blood pressures did not differ among groups. VAC was higher in MHD compared to controls (0.78±0.15 vs 0.69±0.093, p=0.0063), with highest values in those with moderate-severe HD (0.80±0.18, p=0.009). Although CO, global longitudinal strain and strain rate did not differ, other cardiac function measures did include LVEF which was lower (61±9% vs 67±6%, p=0.0033) and E/E' which was higher (median [IQR]: 7.1 [3.5] vs 5.8 [1.9], p=0.015) in MHD. Finally, UtA-PI, UA PI and fetal biometry were similar among groups; however, 10% of MHD vs 0% of controls had a UtA-PI >95th centile. There was no relationship between increased VAC and the uteroplacental circulation at this point in pregnancy.

Conclusion:
Increased VAC in MHD could suggest the presence of reduced LV function, increased arterial load or both in affected pregnancies. Reduced LVEF and increased E/E' indicate reduced cardiac function in MHD, possibly contributing to increased VAC.

Paul Lerner, Nazanin Arjomand Fard, John Maringa Githaka, Hien Q Huynh, Eytan Wine, Troy Perry. ***Establishment of a national surgical tissue biobank for pediatric Crohn's disease in Canada.***

Introduction:
Crohn's disease (CD) is a lifelong gastrointestinal inflammatory disease that often requires surgery, especially when patients are diagnosed in childhood. The pathophysiology and etiology involves an interplay of genetics, the immune system and the enteric microbiome. Consequently, a comprehensive research approach combining analysis of clinical data with tissue analysis to profile alterations in the gene expression, immune cell function, and the microbiome is required. Each pediatric surgical center in Canada averages very few CD resections per year, so a multicenter collaborative national biobank is an ideal platform to conduct this research.
Objectives: We provide a framework for establishing a surgically-oriented biorepository, sharing our experience in developing ethical, logistical, and bench science structures and protocols. Preliminary findings are presented from bulk RNA sequencing as an example of potential biobank-based research applications.

Methods:
Ethics for surgical biobanking were an extension of the Canadian Children Inflammatory Bowel Disease Network (CIDsCaNN). Pediatric surgeons from 10 children's hospitals across Canada were trained virtually, assisted by videos, on tissue collection, handling, and shipping. Inclusion criteria include diagnosed CD, scheduled intestinal resection, age 5-17.2 at the time of surgery, and CIDsCaNN consent. Exclusion criteria include acute intra-abdominal sepsis and IBD with a known monogenic cause. Full-thickness bowel, mesenteric fat, and lymph nodes are collected in the OR and fixed in formalin and RNAlater. National overnight shipping protocols were developed so that tissue collected at any site is processed and analyzed consistently in Edmonton. Detailed surgical, perioperative, hospitalization, and postoperative medical treatment data are collected. Pediatric CD activity scores, anthropometry and biomarkers will be collected at specified intervals with scheduled postoperative endoscopic assessment and intestinal US at sites with this capability. Similar data will be collected at time of flares.

Results:
Tissue was collected from 10 patients in Edmonton as proof-of-concept prior to national launch in 2023. Between November 2023 and January 2024, tissue was collected from five patients (2 sites) and analyzed in Edmonton. Using bulk RNA sequencing on 9 of the first 10 patients, 560 genes were identified that discriminate between inflamed and non-inflamed bowel. Reactome analysis implicates upregulation of several anti-inflammatory pathways in the inflamed bowel.

Conclusions:
Development of a national biobank for surgically resected pediatric CD is feasible with careful planning, stepwise development of protocols, and coordination of multidisciplinary multicenter collaboration. Preliminary bulk RNA sequencing analysis comparing inflamed and non-inflamed bowel demonstrates the potential for promising research using this biobank.

Ricky Liu, Dora Gyenes, Angela McBrien, Luke Eckersley, Alberta Pasco, Lisa Hornberger. ***The complementary role of fetal atrial and ventricular function from the first trimester***

Introduction:
Embryonic development of the human fetal heart is completed by 7-8 weeks of gestation. Thereafter, the cardiac chambers evolve and function to maintain an adequate circulation for fetal growth to term. While the evolution of ventricular function in the mid and third trimesters has been studied for decades, less is understood about early fetal heart function. Furthermore, the role of the fetal atria has been minimally explored. We aimed to investigate changes in fetal atrial and ventricular function and their relationship in the human fetus from 6 weeks to term. We hypothesized that fetal atrial pump function is most robust at early stages, decreasing with normal improvements in ventricular diastolic function.

Methods:
We analyzed fetal echocardiograms performed cross-sectionally from 6-39 weeks of gestation in 277 healthy recruited pregnancies, measuring atrial and ventricular dimensions and Doppler function parameters. One-way ANOVA with Sidak's multiple comparisons test was used to assess changes between gestational age (GA) groups (6-9, 10-14, 15-19, 20-24, 25-29, 30-34, 35-39 weeks). Atrial:ventricular ejection force ratio (AVEFR) was calculated as [VTIoutflow/VTIinflow x (peak velocityinflow2/peak velocityoutflow2)]. Data are presented as mean ± S.D.

Results:
Cardiac dimensions linearly increased with gestation. At 6-9 weeks, ventricular filling was uniphasic during atrial systole and of short duration, progressing to biphasic filling by 10 weeks. From 10-14 to 25-29 weeks, E/A wave ratios increased for both the left (LV) (0.49±0.10 to 0.76±0.09, $p<0.0001$) and right (RV) (0.53±0.11 to 0.77±0.10, $p<0.0001$) ventricles plateauing thereafter. Ventricular inflow duration/R-R interval increased between 6-9, 10-14 and 15-19 weeks (LV 0.23±0.04 vs 0.38 ±0.05 vs 0.43±0.04, $p<0.0001$; RV 0.24±0.04 vs 0.39±0.05 vs 0.42±0.04, $p<0.04$), and LV isovolumic relaxation time/R-R interval decreased from 6-9, 10-14 to 15-19 weeks (0.16±0.04 vs 0.12±0.03 vs 0.10±0.02, $p<0.01$), both plateauing thereafter. Ventricular ejection time/R-R interval decreased through 19 weeks for the LV (0.49±0.04 to 0.43±0.03 $p<0.001$) and 24 weeks for the RV (0.49±0.04 to 0.42±0.02, $p<0.03$). LV isovolumic contraction time/R-R interval decreased from 5-9 to 10-14 weeks (0.13±0.04 vs 0.07±0.04, $p<0.0001$) plateauing thereafter. AVEFR acutely decreased from 6-9 to 10-14 to 15-19 weeks for left (4.1±1.4 vs 3.3±1.0 vs 1.7±0.60, $p<0.002$) and right (5.0±2.7 vs 3.6±1.1 vs 2.2±0.87, $p<0.0001$) hearts with no change thereafter.

Conclusions:
There is an intricate interplay between fetal atrial and ventricular function, with the atria serving a more predominant role in the first trimester at a time of less robust diastolic and systolic ventricular function.

Si Ning Liu, Danny Shimatu, Ben Magalnick, Jad-Julian Rachid, Ibrahim Khodabocus, Hélène Lemieux, Kimberly Macala, Stephane Bourque. ***Investigating the Role of Ferroptosis in Neonatal Sepsis-Induced Liver Injury***

Introduction:
Late-onset-sepsis (LOS) is the dysregulated host response to an infection occurring after 72 hours of life. The Global Burden of Disease study estimates LOS affects 1.3 million neonates annually, with most cases occurring in low- and middle-income countries. Ferroptosis is an iron-dependent type of cell death that occurs following tissue iron sequestration, which is known to occur during inflammation. Given that the liver is a major organ for iron storage, we hypothesized that LOS-induced inflammation would induce ferroptosis, leading to liver dysfunction.

Methods:
Three-day-old Sprague Dawley pups received an intraperitoneal injection of fecal slurry (FS, 1.0 mg/g body weight) or vehicle (5% dextrose). All pups received buprenorphine for pain control and antibiotics with fluids. Pups were euthanized at 8h and 24h for blood and tissue collection. In another subgroup of pups, ferrostatin-1 (Fer-1, 1mg/kg in 0.3% DMSO in saline) or vehicle (0.3% DMSO in saline) was administered subcutaneously 24h and 1h before FS injection to assess the effectiveness of a ferroptosis-specific suppressor in improving liver function. Markers for liver stress (plasma ALT), lipid peroxidation (MDA), and Fe3+ levels were assessed using available kits; gene and protein expression profiles of mediators of ferroptosis were assessed by qPCR and Western blots, respectively.

Results:
FS caused 30% mortality in septic pups ($P<0.0001$). In surviving pups, IL-1β levels were increased, as were liver Fe3+ levels (+60%; $P<0.0001$), and plasma ALT levels (+840%; $P<0.0001$) at 24h post-FS injection. Malondialdehyde, a marker of lipid peroxidation, was increased 8h post FS injection (+230%; $P=0.0005$). Transcript profiles of key regulators of ferroptosis, including glutathione peroxidase 4 (Gpx4) and ferroptosis suppressor protein (Fsp1), were downregulated (-42%, $P<0.0001$; -40%, $P=0.0003$; respectively) in septic pups at 24h post-FS. Pretreatment with Fer-1 did not affect survival in of septic pups, nor did it improve sepsis severity measured by the neonatal rat sepsis scores or plasma ALT levels.

Conclusions:
Despite increased lipid peroxidation, tissue liver iron levels, and downregulation of Gpx4, pretreatment with Fer-1 did not improve liver function or survival outcomes. Investigation on whether Fer-1 ameliorates lipid peroxidation in our model of neonatal sepsis in underway.

Danielle Lysak, Samina Ali, Susan Neufeld, Shannon Scott. ***Children with medical complexity accessing emergency department healthcare: Parent experiences and information needs***

Introduction:
Children with medical complexity (CMC) constitute a growing number of pediatric patients that utilize the emergency department (ED), disproportionately more than children outside of this category. With parents as key informants of their child's most up to date history, they are looked to be expert in their child's care and concurrently manage their own plethora of emotions related to their child's change in clinical status. Caregiver burden is a significant concern for parents of CMC within an ED context. The objective of this patient-oriented study is to explore information needs and experiences of parents accessing emergency health care for their child with medical complexity.

Methods:
Qualitative description methodology guided this project's study design. Parent participants were recruited via purposive sampling within a pediatric specialty clinic for non-invasive ventilation care at a Canadian pediatric tertiary care center. Semi-structured interviews were conducted to obtain data about parent experience and information needs in the emergency department. Data collection was concurrent with inductive content analysis of interview transcripts.

Results:
Nine interviews with ten parents yielded four content categories: How the emergency department is different for CMC, parents as key care coordinators, ED experience and resilience, and communication and learning preferences. Parents of CMC develop expert knowledge in their child's specific health needs through experience in the health care system. Waiting room experience and ED processes varied in this population of high care consumers. Parents discussed how their child may bypass waiting rooms due to acuity and often remain in the ED for extended periods of time to stabilize their condition. Parents relied on close connections with their child's specialty clinic teams and/or complex care pediatrician to mitigate ED encounters. Challenges with communication of health history and between teams in emergent settings were identified by participants. Parents preferred to learn about the ED or their child's health in online formats for accessibility.

Conclusions:
Amplifying the perspectives of parents of children with medical complexity is a vital step to understand and address the challenges of accessing emergency healthcare. Understanding the gaps in communication for CMC and their families in the ED context may help specialty clinics and pediatricians of CMC develop emergency information forms or tools to support handover of critical health information. Interviews with parents provided key insights to inform and improve the care provided in the ED for this growing population of children.

Corin MacPhail, Liz Dennett, Elizabeth Rosolowsky, Connie Yang, Anne Hicks. ***Adrenal Insufficiency Secondary to Inhaled Corticosteroid Use in Children with Asthma***

Introduction:
Asthma is a common chronic childhood condition, leading to significant morbidity and mortality amongst children. Inhaled corticosteroids (ICS) as treatment for asthma have significantly improved health outcomes and quality of life for patients with asthma. While ICS are essential in asthma management, they are not without risk; adrenal insufficiency (AI) secondary to adrenal suppression from ICS is a rare but potentially life-threatening side effect that is becoming increasingly recognized in the literature. Emerging data is challenging safety assumptions, indicating types and doses of ICS previously viewed as safe carry a risk of AI. The objective of this project is to update the existing knowledge on the risk of AI secondary to ICS in children with asthma, and a secondary objective includes to provide recommendations for screening patients at risk.

Methods:
A Systematic Review will be conducted with methodology modelled on previous reviews on the topic and following current systematic review recommendations and standards. Scientific databases will be searched using key words and phrases, the abstracts from resulting articles will be screened using pre-selected inclusion and exclusion criteria, and the subsequent included articles will be analyzed.

Expected Results and Conclusions:
This project is expected to lead to compiled and updated information on AI risk, including patient and medication characteristics, as well as recommendations for AI screening in children with asthma on ICS. Clinical guidelines for patients and physicians are greatly needed, and this remains a gap in the current literature. As such, collaboration with a Knowledge Translation/Learning Health Systems team will allow for the creation of practical tools, one for patients/families, and one for primary care providers (general pediatricians, family physicians) regarding AI risk secondary to ICS use, symptoms, and monitoring that can be used in clinical practice.

Matthew D. Martens; Mostafa Khairy; Shubham Soni; Dania Al-Rimawi; Mya A. Schmidt; Daniela Y. Morales-Llamas; Sareh Panahi; Heidi L. Silver; Jody L. Levasseur; Mourad Ferdaoussi; Ayman O S El-Kadi; and Jason R.B. Dyck. ***Ketone Therapy Negatively Affects the Juvenile Heart***

Introduction:
Based on the observation that ketone bodies can act as both metabolic substrates and signalling molecules (e.g., anti-inflammatory and epigenetic regulation effects), there is growing interest in the therapeutic potential of ketones for the management of various cardiac diseases. While the beneficial effects of ketones have been well characterized in the adult heart, little is known about their safety and efficacy in the pediatric heart. Since developing ketone-based therapies for children with cardiac disease may begin to be deployed, the aim of this study was to investigate the safety of dietary ketone supplementation in healthy young mice.

Methods:
To assess if ketone therapy was safe in juvenile mice, we used oral supplementation of ketone esters (KE) to increase β-hydroxybutyrate (βOHB) levels. Specifically, oral gavage of exogenous KE was given once weekly for three consecutive weeks to 5-week-old (juvenile) and 21-week-old (adult) male mice. One week following the last KE treatment, mice were subjected to transthoracic echocardiography, and tissues were collected for downstream analysis.

Results:
While KE had no negative structural or functional effects in the adult heart, juvenile mice unexpectedly demonstrated reduced cardiac mass and decreased cardiac function, despite otherwise normal development. Further analysis revealed that KE used in vivo or βOHB used in cell culture, promoted pro-cell death BNIP3 expression and activity through increased ketone import and HDAC1 inhibition in the juvenile, but not the adult heart. We further demonstrate that early-life KE exposure makes juvenile mice susceptible to recurrent or progressive cardiac dysfunction when subjected to a secondary insult later in life (eg., hypertension).

Conclusions:
Dietary supplementation with KE was detrimental in the young heart and not in adult hearts. This is likely due, in part, to the activation of a novel, context-dependent, signalling pathway involving βOHB-HDAC1-BNIP3. This pathway potentially leads to diminished heart mass, compromised systolic and diastolic function, and impaired adaptation to subsequent stressors later in life. These results emphasize the need for cautious consideration when employing ketones as therapeutic agents in pediatric populations.

Mallory McNiven, Andre Isaac, Safwat Girgis, Susan Chafe, Rose Girgis. ***A single-center experience with pediatric thyroid nodules***

Introduction:
Pediatric thyroid cancer is a rare diagnosis; however, there is evidence that the incidence has been increasing in recent years. The majority of cases in pediatrics are due to papillary thyroid cancer, with follicular and medullary thyroid cancer being much less common. Most pediatric patients present with an asymptomatic thyroid nodule. Papillary thyroid cancer is often aggressive in the pediatric population, presenting with metastatic disease more often than adult patients. In comparison, follicular thyroid cancer is rarely invasive with a low risk for metastatic disease.

Methods:
16 patient retrospective case series. We describe the clinical presentation, investigations and management of thyroid nodules seen from 2019- 2023 at the Stollery Children's Hospital.

Results:
16 pediatric patients, aged 4-17 years old, presented with suspicious thyroid nodules on ultrasound. 7/16 patients were seen within the last year alone. They all underwent an ultrasound guided fine needle aspiration (FNA) biopsy. 8/16 cases were positive for malignancy. 7/8 cases had papillary carcinoma, while 1/8 had follicular neoplasm. 7/8 had metastatic disease at diagnosis. Out of the benign nodules, one patient presented with a DICER1 mutation, and another was found to have a PTEN mutation. One patient had indeterminate pathology of follicular neoplasm and underwent molecular studies which were positive for a high risk PAX8/PPARG mutation. Total thyroidectomy was performed, with final pathology revealing follicular carcinoma.
Surgical management included hemi or total thyroidectomy by 2 dedicated ENT surgeons. Post-operative complications included hypoparathyroidism and dysphonia. One patient developed airway obstruction a few days postoperatively due to abscess formation in the operative bed. All patients with malignant nodules received radioactive iodine ablation postoperatively and subsequently were started on Levothyroxine.

Conclusion:
While pediatric thyroid cancer is a rare diagnosis, the incidence is increasing. Thyroid nodules require prompt recognition and investigation for malignancy. Molecular studies are valuable in further classifying indeterminate nodules and determining malignancy risk.

Natasha Mense-Dietrich, Aimann Surak, Vazhkudai (Kumar) Kumaran, Abbas Hyderi. ***Hemodynamic phenotypes in the transitional period and neonatal morbidities of extremely low gestational age neonates***

Introduction:
Infants born before 29 weeks (extremely low gestational age neonates, or ELGANs) face increased rates of morbidity and mortality, including intraventricular hemorrhage (IVH) and pulmonary hemorrhage. These disorders are potentially linked to the dynamic circulatory changes in the first 72 hours of life, which are incompletely understood and often dysregulated. It is established that the preterm myocardium has limited capacity to respond to changes in preload and afterload. The limited tolerance to increases in systemic vascular resistance (SVR) results in a relative compromise of cardiac output and relative systemic hypoperfusion. Following the first few days of life, the preterm myocardium adapts, with increasing cardiac output and systemic perfusion. This sequence could be linked to the hypoperfusion-reperfusion injury theorized to lead to IVH. Additionally, the premature myocardium's limited ability to accommodate additional preload and afterload likely predisposes infants to pulmonary hemorrhage due to resultant pulmonary venous congestion. A previous local study (MUSE trial) on the impact of multimodal monitoring during the transitional period of ELGANs affords an opportunity to analyze hemodynamic data to understand the impact of afterload on neonatal morbidities, and its association with dysregulated transitional circulation. The aim of this study is to confirm if there is a hemodynamic phenotype (i.e. increased left ventricle afterload) of ELGANs who develop IVH or pulmonary hemorrhage during the first few days of life, compared to those unaffected. We hypothesize that dysregulated transitional circulation and developing pulmonary hemorrhage and/or IVH is related to higher afterload in the first 3 days of life. Primary outcomes include IVH, pulmonary hemorrhage, and their composite. Afterload will be assessed by calculating left ventricular end systolic wall stress (LVESWS) and SVR.

Methods:
Data will be extracted from the MUSE trial REDCap database, whose intervention for ELGANs included serial echocardiography and use of cerebral near infrared spectroscopy (NIRS). Echocardiography images were reviewed with measurements and calculations for LVESWS by authors AS and KK (both practicing neonatal echocardiography faculty). Baseline descriptive characteristics will be followed by statistical analysis will be conducted using test statistics of odds ratio and logistic models for the relationship between LESWS/SVR and dysregulated transition morbidities. This is being performed by an affiliated statistician with the University of Alberta.

Results:
Statistical analysis ongoing, with results expected by research day.

Conclusions:
We hope to elucidate a relationship between increased afterload and SVR with disorders of dysregulated transition

Nikki Mitchell, Marghalara Rashid, Jessica Foulds, Karen Forbes. ***Thinking about the Why: A qualitative study on students' perspectives of pediatric team-based learning discussions***

Introduction:
Clinical reasoning (CR) encompasses many cognitive processes, and given its complexity has been a challenging area to research, both in teaching and assessment. Key-feature questions (KFQs) are one validated means to assess CR; these focus on key features, or significant steps in problem resolution, and those aspects of a problem where students are likely to make errors.
Our pediatric clerkship includes a modified team-based learning (TBL) session where students work through a series of clinical scenarios using KFQs. Students complete an Individual Readiness Assessment Test, followed by a Group Readiness Assessment Test in groups of 4-5 using the same clinical scenarios. We have previously demonstrated that these sessions are effective in teaching and assessing clinical reasoning. This study builds on these findings, examining the group discussions, where students articulate their clinical decision making with peers, to explore the thought processes and factors that contribute to students' development of CR.

Methods:
We conducted a descriptive qualitative focus group study. Six focus groups of 3-6 students were conducted virtually by Zoom, 45-60 minutes in duration. Twenty-six third-year clerkship students participated in the study. Transcripts were transcribed verbatim and analyzed using thematic analysis. Codes were analysed to draw connections between the common thoughts, processes, and conditions experienced by the medical students to generate themes. Data were verified upholding the principles of qualitative rigor to assure methodological credibility, transferability, and confirmability.

Results:
Our data analysis revealed five themes: (a) self-confidence, including both enablers and deterrents to confidence and the impact of calibration with peers; (b) the experience of TBL, including identifying knowledge gaps through learning from others, obtaining consensus, and the impact of the students limited clinical experience; (c) trust, as related to sense of authority and position of authority of others and implications on trusting their knowledge; (d) clinical reasoning strategies implemented by students, including articulating a problem representation, pertinent positives and negatives, integrating feedback from peers, illness scripts; (e) clinical application, involving choosing responses wisely and committing to an answer, and parallel to real life.

Conclusions:
Although not labeled as such, CR strategies were described by participants. TBL prompted thinking aloud, hypothesis seeking and generation. Student's perspectives were greatly impacted by clinical experience, including the lack of experience, and this experience influenced all of the identified themes. How these sessions translate to authentic clinical encounters, and how best to assess these skills with patients, remain as future directions for exploration.

Julie Nguyen, Sarah Forgie, Wayne Clark, Ida John, Marghalara Rashid. ***Exploring Strategies to Teach Cultural Safety in the Context of Indigenous Health Curriculum Among Faculty and Post Graduate Medical Learner's. A Multi-Site Study.***

Introduction:
In an age of constant change, post-graduate medical programs must ensure that future medicine practitioners are trained with a curriculum encompassing current societal ideas and values. Fair, equitable, and unbiased medical treatment of Indigenous patients is an area of concern within the current medical model. To ensure that patients, especially Indigenous patients, are treated in a fair, equitable, and unbiased manner, post-graduate programs must pivot to include curriculum with cultural safety components. Research on Indigenous health curricula in post graduate programs in Canada is sparse. To gain a better understanding of this knowledge gap, we wanted an in-depth understanding of faculty members and resident's perspective on Indigenous health curriculum and how that may take shape in the future. By further exploring the various teaching strategies that programs and educators can employ during the implementation of Indigenous health curriculum.

Methods:
A constructivist grounded theory approach was used as a part of a larger study investigating how residency training programs can optimize Indigenous health to gain the proper cultural competencies to work with the Indigenous patient population. A secondary research question relating to how programs can teach and develop a culturally sensitive postgraduate Indigenous curricula was the focus of this study.

Results:
A total of 40 participants were recruited: 21 faculty members and 19 residents from two large research-intensive universities in Canada. Three main themes, with sub-themes emerged because of this research (i) Components to consider when developing an Indigenous curriculum; (ii) Strategies for teaching Indigenous curriculum in PGME.; (iii) Residency curriculum should be informed by cultural safety.

Conclusions:
The creation and implementation of new curriculum is not an easy task. Paired with the intricacies and challenges that many Indigenous patients face when trying to access the current healthcare system can be daunting. However, decreasing challenges for Indigenous patients and increasing cultural safety is at the forefront of many faculties and resident's minds. By exploring teaching strategies, it ensures that curriculum can be taught in an effective manner.

Vanessa Campes Dannenberg, Daniel Ofosu, Mathieu Chalifour, Ella Milne, Shannon Scott, Maria L. Castro-Codesal. ***What's important? Caregivers' priorities for their children's home non-invasive ventilation: a mixed-methods study***

Introduction:
Non-invasive ventilation (NIV) is increasingly used in children with life-limiting conditions (LLCs) to treat their breathing difficulties and potentially prolong life. To date, research on NIV is almost exclusively quantitative, failing to explore how this technology influences the life and death experiences of children with LLCs. An in-depth understanding of parents' experiences with NIV in this vulnerable group of children is necessary to inform optimal care.

Objective:
To explore the lived experiences of parents caring for a child with LLCs who used non-invasive ventilation both during and at the end of their life.

Methods:
This was a qualitative study using in-depth interviews with bereaved parents of children with LLCs who had used NIV. Interviews were audio recorded and transcribed verbatim, then analyzed using interpretative description methodology.

Results:
Parents shared personal insights on their experiences with NIV therapies throughout the progression of their child's illness towards and during end of life. Themes arising from parent narratives encompassed: decision making through their child's life trajectory - by the medical team and by the parents and the child; the importance of the child's "voice" at all stages of their illness; the meaning of NIV and how that changed over time; and the end of life experience as it related to their child's use of NIV. Parent reflections highlighted the need for health care providers and families to have a shared understanding of the impact of and goals for NIV therapy throughout a child's life journey and towards end of life. Powerful descriptions of end-of-life experiences revealed how parents continue to live with their decisions many years following the death of their child.

Conclusion:
In this study, parent narratives provided inimitable and meaningful insights on the experience of NIV therapy for children with LLCs throughout the life trajectory. These rich and personal descriptions highlight the importance for NIV therapy decisions to align with child and family goals at all stages of a child's life and end of life. Eliciting and integrating child and family centered goals in decisions on the initiation and use of NIV therapy in children with LLCs is essential to optimize care.

Hayley Turnbull, Bethan Kingsley, Maria L. Castro-Codesal. ***The journey for children with life limiting conditions using non-invasive ventilation: parent perspectives***

Introduction:
While there is an increasing number of children treated with non-invasive ventilation (NIV), there is limited evidence about their families' experiences and priorities related to the benefits and challenges of NIV. Our aim was to establish priorities regarding benefits and challenges of NIV reported by caregivers, along with their expectations, concerns and insights about home NIV use in their children.

Methods:
A survey-based mixed-method study. Parents/caregivers of children 0-18 years using home CPAP or BPAP for ≥ 3 months answered a semi-structured anonymous survey with multiple-choice, ranking, and open-ended questions. Descriptive analysis was used to summarize caregiver's demographic characteristics, children's clinical information, and answers to multiple-choice questions. Thematic analysis was used to synthesize qualitative data, and all the data were triangulated during the interpretation.

Results:
Seventy-five caregivers answered the survey (82% mothers). Improved sleep, rest, daytime energy levels, and breathing during sleep were rated as important or very important benefits of NIV for 90% of caregivers. Over 60% considered reduction in hospitalizations and emergency visits as important or very important. Better breathing during sleep was the top one priority for research investment for 51% of respondents. Among NIV-related challenges becoming dependent on NIV was considered important or very important by 76%, followed by mask-related face complications (68%), difficulty tolerating the mask (60%), and nasal congestion (58%). Caregivers were least worried about their own sleep disruption (43% - not important at all/not very important). NIV dependence was the top one priority for research investment for 34% of caregivers. Thematic analysis complemented quantitative data providing nuances to the potential benefits and challenges with NIV including (1) "better days and nights", where caregivers highlighted the child's improvements in mood, attention, energy levels, rest and quality of sleep; (2) "Finding the right mask" highlighted difficulties related to the limited mask options for children leading to air leaks, side effects, such as skin irritations/indents, and facial/head shape changes; and (3) "Having a team approach", where the importance of having the support of a team with a holistic approach, transparency and accessibility was identified as making a significant difference in the successful use of NIV by their child.

Conclusions:
Indicators of improvement in children's overall health and mask-related issues were identified by caregivers as the most important benefits and challenges of NIV therapy in qualitative and quantitative data. Caregiver's insights highlighted the importance of having a team approach for the success of the treatment.

Astrid Lang, Alice Chiu, Janet Cohen, Vanessa Steinke, Mark Moland, Justine Turner. ***Parent reported health related quality of life caring for children with pediatric feeding disorders in Alberta***

Introduction:
Children with pediatric feeding disorders (PFD), including those requiring tube feeding, require significant care. Caregiver burden includes time, cost, as well as worry over patient morbidity and mortality (1). This project used a validated health-related quality of life (HRQoL) tool for caregivers of children with PFD: the Feeding/Swallowing Impact Survey (FS-IS). The FS-IS has three subscales related to daily activities, worry, and feeding concerns, scored 1-5 with 5 the most adverse. Prior studies have shown both the total sub-scale scores and the total score correlate with generic quality of life instruments for pediatric caregivers (2). Data was obtained from a provincial quality improvement initiative, the Alberta Provincial Pediatric Eating and Swallowing (PEAS) Project.
Aims: 1. To determine the HRQoL reported by caregivers of children with PFD in Alberta. 2. To determine if tube feeding is associated with worse reported HRQoL.

Methods:
Caregivers receiving feeding and swallowing services in Alberta were offered the opportunity to complete the FS-IS online or by phone at baseline and 12 months later. All demographic data was self-reported.

Results:
In total 52 caregivers completed the surveys once and 16 at follow up. Average baseline FSIS was 3.1 (range 1.2-4.7) and at follow up was 3.0 (range 1.5-4.2). There was no difference between the scores of those completing at both time points (p=0.78). At all timepoints only 15% of the cohorts reported scores ≤2. As shown in Table 1, children who were tube fed were older with a longer duration of PFD symptoms, however HRQoL scores were not different to children not ever tube fed.

	Tube Fed Ever (n=46)	**Never Tube Fed (n=6)**	**p-value**
Female (%)	39	33	0.75
Age (months)	56	23	0.001
Duration PFD symptoms (months)	52	20	0.001
Initial FS-IS	2.9	3.2	0.43
***** *FS-IS Global Score (1=never to 5=almost always)*			

Conclusions:
Caregivers of children with PFD face challenges, which do not abate over time. Surprisingly, in our cohort this is independent of the need for tube feeding and of the duration of PFD symptoms, although we acknowledge the small sample size of those never tube fed. Longitudinal follow-up studies and strategies to improve quality of life are needed

Tiffany Fitzpatrick, Peter Yamoah, Gina Lacuesta, Manish Sadarangani, Victoria Cook, Persia Pourshahnazari, Chrystyna Kalicinsky, Julia E. M. Upton, Scott B. Cameron, Karver Zaborniak, Amin Kanani, Godfrey Lam, Catherine Burton, Cora Constantinescu, Jeffrey M. Pernica, Zainab Abdurrahman, Stephen Betschel, Jean-Philippe Drolet, Gaston De Serres, Caroline Quach, Anne Des Roches, Hugo Chapdelaine, Marina I. Salvadori, Alex Carignan, Athena McConnell, Anne Pham-Huy, A. Catherine Buchan, Juthaporn Cowan, Kyla Hildebrand, and Karina A. Top. ***Revaccination outcomes among adolescents and adults with suspected hypersensitivity reactions following COVID-19 vaccination: A Canadian Immunization Research Network study***

Introduction:
COVID-19 vaccination has been associated with anaphylaxis and hypersensitivity reactions. Although these are rare, vaccine recipients must be evaluated to assure their safety. The Canadian Special Immunization Clinic (SIC) Network has been engaged in evaluating patients with adverse events following immunization (AEFI) and potential contraindications to immunization since 2013. Infectious disease physicians and allergists in the SIC Network developed guidance for evaluating patients with suspected hypersensitivity reactions following COVID-19 vaccination. This study evaluated management and adverse event recurrence following subsequent COVID-19 vaccinations.

Methods:
Individuals aged 12 years and older enrolled at participating Special Immunization Clinics (SICs) before February 28, 2023 who were referred for suspected or diagnosed hypersensitivity reaction following COVID-19 vaccination, or for prevaccination assessment of suspected allergy to a COVID-19 vaccine component were included. De-identified clinical assessments and revaccination data, captured in a centralized database, were analyzed.

Results:
The analysis included 206 participants from 13 sites: 26 participants referred for pre-vaccination assessment and 180 participants referred for adverse events following COVID-19 vaccination, 36/180 (20.0%) with a final diagnosis of anaphylaxis, 63 (35.0%) with non-anaphylaxis immediate hypersensitivity reactions, 33 (18.3%) with other hypersensitivity reactions, and 48 (26.7%) participants referred for suspected hypersensitivity but with a final diagnosis of non-hypersensitivity AEFI). Among participants referred for AEFIs following COVID-19 vaccination, 166/180 (92.2%) were recommended for COVID-19 revaccination after risk assessment, of whom 158/166 (95.2%) were revaccinated (all with a mRNA COVID-19 vaccine). After revaccination, only 2/35 (5.7%) participants with history of anaphylaxis and 0/57 with history of non-anaphylaxis immediate hypersensitivity had recurrent AEFI symptoms concerning for anaphylaxis. All 26 participants referred pre-vaccination, including 9 (34.6%) with history of polyethylene glycol-asparaginase reactions, were vaccinated without occurrence of immediate hypersensitivity symptoms.

Conclusion:
Most individuals in this national cohort who experienced a hypersensitivity event following COVID-19 vaccination were revaccinated without AEFI recurrence, suggesting that specialist evaluation can facilitate safe revaccination. This study confirmed the safety of COVID-19

vaccination among individuals with diagnosed hypersensitivity reactions (including anaphylaxis) following a prior vaccination, as well as those with history of reactions to PEG products. These findings and the high participant acceptance of revaccination, support the value of specialist assessment in facilitating full vaccination of these patients.

Mya A. Schmidt, Yasser Abuetabh, Heidi Silver, Matthew Martens, Shubham Soni, Jason R.B. Dyck. ***Investigating the Role of Ketones in Regulating Inflammation***

Introduction:
Ketone bodies are small, energy-rich molecules synthesized primarily by the liver. They are particularly important during periods of fasting, low carbohydrate intake, or increased metabolic demands. In lieu of glucose, the brain and heart can shift to rely primarily on ketones to meet their energetic needs. Emerging research has revealed that the most abundant ketone body, beta-hydroxybutyrate (βHB), not only functions as a key metabolic substrate but also exerts anti-inflammatory signaling properties, via inhibition of the NLR family pyrin domain containing 3 (NLRP3) inflammasome. Whilst it has been demonstrated that βHB supplementation is beneficial in various rodent models of inflammatory diseases, it remains unknown whether ketones are a fundamental necessity for the body to properly balance and safeguard inflammation from reaching harmful levels, or if sex differences play a role in their anti-inflammatory effects.

Methods:
We administered 10 mg/kg of LPS or vehicle (saline) intraperitoneally to wild-type male and female 8-week-old C57BL/6J mice, and characterized the expression of genes and proteins involved in ketone metabolism and the inflammatory response in the vital organs. Additionally, we generated a line of inducible liver-specific HMGCS2 (HMGCS2 3-hydroxy-3-methylglutaryl-CoA synthase 2) knockout mice using the Flox-cre system, which have significantly decreased circulating ketone levels following delivery of adeno-associated viral (AAV) delivery of Cre recombinase driven by the albumin promoter.

Results:
We demonstrate that healthy female mice have significantly higher levels of hepatic 3-hydroxybutyrate dehydrogenase 1 (BDH1) protein expression than healthy males, which coincides with our finding that they have significantly higher fasted blood βHB levels than males. Additionally, we show that HMGCS2 KO in the liver results in an upregulation of HMGCS2 expression in the kidneys. Interestingly, we discovered that healthy wild-type females have significantly higher renal HMGCS2 expression than males. Currently, we are exploring whether females are more protected from LPS-induced damage to the kidneys and other organs due to the observed sex differences in ketone dynamics. Moreover, we will continue to investigate whether the loss of circulating ketones exhibited in our knockout model exacerbates the inflammatory response and aggravates multi-organ injury induced by LPS.

Conclusion:
The results of this research will enhance our understanding of the body's endogenous anti-inflammatory mechanisms and determine whether ketones are indeed a homeostatic regulator of inflammation. Ultimately, this work will help inform the utility and clinical implementation of ketone-centric therapies, such as exogenous supplements and SGLT2 inhibitors, in treating inflammatory disorders

Summer Hudson, Samina Ali, Manasi Rajagopal, Jennifer Stinson, Katie Gourlay, Keon Ma, Ben Vandermeer, Bailey Felkar, Kurt Schreiner, Amanda Proctor, Jennifer Plume, Lisa Hartling. ***A randomized controlled trial of virtual reality-based distraction for intravenous cannulation-related distress in children***

Introduction:
Children commonly experience under-treated pain and distress related to intravenous insertions (IVI). Virtual reality (VR) has emerged as a promising tool to mitigate procedure-related distress; however, existing evidence has largely employed expensive, custom VR software. Our objective was to determine whether commercially available VR applications are effective in reducing children's procedure-related distress when added to standard of care (SOC), which included topical anesthetic cream, for children undergoing IVI in the pediatric emergency department (PED).

Methods:
Children aged 6 to 17 years requiring IVI were recruited for a two-arm randomized controlled trial. The primary outcome was child distress, measured using the Observational Scale of Behavioural Distress – Revised (OSBD-R, score range 0-23.5). Secondary outcomes included child pain intensity (measured with the Faces Pain Scale-Revised, score range 0-10) and child fear [measured by the child fear scale (CFS), score range 0-5]. Trial registration number: NCT04291404C.

Results:
82 children and their caregivers were included. Mean (SD) child age was 11.1 years (2.9) and 54% (45/82) were female; 72% (55/76) had experienced a previous IVI. There was no difference in mean (SD) pre-procedural OSBD-R scores in the VR arm [0.39 (0.70)] compared to SOC arm [0.18 (0.49)] ($p = 0.16$). Post-procedure OSBD-R mean (SD) scores were also similar across VR [0.16 (0.30)] vs SOC [0.19 (0.48)] arms ($p = 0.45$). There was no difference between measured mean (SD) total OSBD-R scores in the VR arm [1.1 (1.5)] compared to SOC [0.7 (1.4)] ($p = 0.08$). There was no reduction in mean (SD) procedural pain intensity in the VR group [4.2 (3.1)] compared to the SOC group [4.1 (3.2)] ($p = 0.85$). There was no difference in mean (SD) child CFS score during IVI in the VR arm [0.97 (1.33)] versus SOC [0.97 (1.15)]. Notably, technical issues with the VR equipment were reported in 26% (10/39) of cases.

Conclusions:
VR distraction therapy employing commercially available software was not associated with reduction in procedural distress, pain, or fear, above that provided with SOC, for children undergoing IVI in the PED. This result highlights the need for more accessible custom VR distraction software, created to meet the unique psychological needs of children undergoing medical procedures in the high stress ED setting. Further study is needed to directly compare custom versus commercially available VR software, and other distraction techniques, for use in the healthcare setting.

Marwa Ramsie, Tze-Fun Lee, Megan O'Reilly, Georg M. Schmölzer. ***Pharmacokinetic and pharmacodynamic evaluation of various doses and routes of administration of vasopressin and epinephrine in a neonatal swine model***

Introduction:
At birth, 0.1% of term infants and up to 15% of preterm infants receive cardiopulmonary resuscitation, including chest compressions and the vasopressor epinephrine (adrenaline); however, approximately one million of these newborns will die annually. Epinephrine is currently the only vasopressor recommended during neonatal resuscitation by the International Liaison Committee on Resuscitation; however, concerns regarding its adverse effects have led to a search for an alternative. Vasopressin has been theorized to be this alternative. Pediatric and adult studies suggest vasopressin more effective during asystole, one of the main cardiac arrest rhythms in newborns. This study aimed to determine the optimal vasopressin dosage for neonatal resuscitation using a piglet model. We hypothesized that 0.4IU/kg was the optimal intraosseous (IO) and intravenous (IV) dose, and that the endotracheal (ET) route of administration will have worse pharmacokinetic and pharmacodynamic outcomes compared to IO and IV.

Methods:
Piglets 1–3 days of age were anesthetized, intubated via a tracheostomy, and ventilated. After a 60-minute stabilization period, piglets were randomized to receive one of the following doses of IO vasopressin (0.2U/kg, 0.4U/kg, 0.8U/kg) or epinephrine (0.02mg/kg), ET vasopressin (4IU/kg, 8IU/kg, 16IU/kg) or epinephrine (0.1mg/kg), nasal vasopressin (8IU/kg, 16IU/kg, 32IU/kg) or epinephrine (0.1mg/kg), or IV vasopressin (0.4IU/kg). Hemodynamic parameters were continuously measured, and blood was collected at baseline and multiple time points throughout the one-hour observation period.

Results:
Baseline parameters were similar between all groups. In the IO and ET groups, highest heart rates, cardiac output, carotid blood flow, and ejection fraction were observed in the epinephrine groups ($p<0.05$). Mean arterial blood pressure was significantly lower in IO and ET epinephrine groups compared to vasopressin ($p<0.05$).
The maximum plasma concentration (Cmax) and time to maximum plasma concentration (Tmax) were not different between IO or IV vasopressin doses ($p>0.05$). ET 4 and 16IU/kg groups had significantly lower Cmax and higher Tmax compared to both 0.4 and 0.8IU/kg IO vasopressin groups ($p<0.05$). There were no differences between IO or IV pharmacokinetic parameters of area under the curve, half-life, systemic clearance (Cl), or volume of distribution at steady state (Vss) ($p>0.05$). Elimination parameters such as Cl could not be calculated for any ET or nasal groups.

Conclusions:
The optimal IO and IV vasopressin dosage is 0.4IU/kg. Significantly lower Cmax, higher Tmax, delayed absorbance and elimination observed in the ET groups indicate the route is a poor choice during emergency scenarios where immediate drug delivery and absorbance is required.

Maria Ren, Stephen Lin, Dr. Eytan Wine, Dr. Diana Mager, Jessica Wu. ***The out-of-pocket cost of nutritional therapies used to induce remission in pediatric Crohn's disease.***

Introduction:
Crohn's disease is an inflammatory bowel disease that can affect any part of the digestive tract. While there is no cure, nutritional therapies can induce Crohn's disease remission in children without the side effects caused by medication therapy. Exclusive enteral nutrition (EEN) and the Crohn's Disease Exclusion Diet (CDED) are both effective nutritional therapies. The first-line therapy is EEN, which uses only formula to meet children's energy needs. Alternatively, the CDED is a specialized diet with minimally processed foods coupled with partial enteral nutrition. A common alternative for nutritional therapies is prednisone, an anti-inflammatory corticosteroid medication that can cause various short- and long-term side effects. Although nutritional therapies have advantages, a common patient- and family-reported barrier to adherence for both EEN and the CDED has been the additional out-of-pocket cost. We aimed to evaluate the potential financial burden associated with pediatric Crohn's disease nutritional therapies.

Methods:
We compared the cost of the CDED, EEN, and prednisone to the cost of a standard healthy diet in Edmonton. Six food records of children ages 10-15 following the CDED were analyzed for food portion and cost. We collected food costs from 4 grocery stores in Edmonton to determine the cost of the CDED. The Edmonton Nutritious Food Basket was our reference tool to measure the minimum cost of healthy eating in Edmonton. Two formulas commonly used in pediatric Crohn's disease were also analyzed for average cost - Boost Plus and Modulen. Prednisone costs were estimated with a local pharmacy.

Results:
The typical healthy diet standard was the lowest-cost diet at $11.65 daily. Costs increased by following any nutritional therapies: CDED was $17.10 daily using Boost Plus and $28.86 daily using Modulen; EEN costs $17.35 daily using Boost Plus and $47.45 daily using Modulen. Medication (Prednisone) costs $0.50 daily. Overall, the additional cost of treatment over the first 6 weeks was at least $200 for nutritional therapies and $20 for medication when compared to a typical diet.

Conclusion:
Although nutrition therapy is considered the first-line treatment for pediatric Crohn's disease, both EEN and the CDED cost over 10 times more than their pharmaceutical equivalent. Specialized nutrition-based diets could be a substantial financial burden to many households despite the health benefits. We aim to use this data to continue to advocate for ways to support Albertan families following nutritional therapies.

Rios, J., Villalobos, L., Adams, K. & Leung, A. ***Attention in Children with Cerebral Palsy: A Scoping Review.***

Introduction:
Cerebral palsy (CP) is the most common cause of motor disability in childhood. CP is defined as a group of disorders that affect an individual's movement, posture, and balance and it results from disturbances to the developing brain at any time during pregnancy through early childhood. Despite the well-documented motor impairment, limited research has been conducted toward understanding cognitive performance in this population, particularly in attention. This review aims to explore existing literature on attention in children with CP, identifying variations in attention based on the level of motor function (GMFCS) and the assessment tools utilized to evaluate attention in this population.

Methods:
Data was obtained from Scopus, Web of Science, Embase, MEDLINE, PsycINFO, and CINAHL using a combination of expressions including "cerebral palsy" AND "children" AND "attention". Only original research articles in English were included, and the search covered studies published from the date of the journal's inception through December 19, 2023. Title and abstract screening were completed by two independent reviewers; conflicts were solved by a third reviewer. Data extraction is ongoing using Covidence software. Descriptive statistics and a narrative summary will be done to report results.

Results:
The initial database search pulled a total of 1837 studies. After screening titles and abstracts and removing duplicated studies, 120 full papers were selected for full-text review. A preliminary analysis of the selected studies provides an overview of the available information on attention in individuals with CP.
Our initial results indicate that the most reported topics are: sustained attention, attention span and visual attention. However, there is a notable paucity of studies addressing more complex attentional processes, such as switching or divided attention.

Conclusions:
These preliminary results underscore the need for further exploration of attentional types beyond those commonly studied. Broader attention categories need to be investigated, which may provide valuable information about the cognitive functioning of children with cerebral palsy.
This review serves as a baseline for future research in the field of cerebral palsy, especially about attentional processes. Given that attention is a fundamental element for overall performance, the knowledge gleaned from this review is crucial for guiding interventions and shaping future developments.

Saima Ghafoor, Elizabeth Garcia, Kristin Hinton, Tak Landry, Sujata Persad. ***Overexpression of Active Beta-Catenin Promotes an Invasive Phenotype in Osteosarcoma***

Introduction:
Osteosarcoma (OS) is a highly aggressive type of primary bone cancer that affects children and adolescents adults. OS mainly arises in the metaphysis of long bones. The annual incidence is 2-5 per million cases and the 5-year survival rate is 60%-70% in the absence of metastasis. Survival decreases to <20% in metastatic cases. Despite the utilization of various treatment approaches, overall survival rates have remained relatively unchanged over the past two decades. The pathophysiology of OS metastasis significantly involves the Wnt/β-catenin signaling pathway, with β-catenin overexpression linked to metastasis. β-catenin is sequestered in the cytoplasm and targeted for degradation in the absence of Wnt, while its dephosphorylation in the presence of Wnt enables nuclear translocation and gene transcription. Active β-catenin (ABC), a partially dephosphorylated form of β-catenin that exhibits higher transcriptional activity compared to unphosphorylated β-catenin and is regulated by crosstalk between the PI3K and Wnt/β-catenin pathways. We have previously shown an association between elevated ABC levels and aggressive/metastatic OS cell lines. Further, inhibition of the canonical Wnt pathway suppresses OS cell proliferation, invasion, migration, and colony formation in vitro. This study investigates the direct role of ABC, and OS progression to an invasive phenotype.

Methods:
To directly ascertain ABC's role in OS progression, we created a GFP-tagged ABC fusion construct that mimics ABC's N-terminal phosphorylation/dephosphorylating pattern. We transfected the OS cell lines with the plasmid and performed migration and invasion assay, western blot, immunofluorescence and immunohistochemistry analysis. The same cell lines and plasmid were used to establish a 3D culture.

Results:
We have determined GFP-β-catenin displays functional characteristics similar to endogenous β-catenin.Two OS cell lines were transfected with pEGFP-ABC, pEGFP-β-catenin, and an empty vector pEGFP. The results indicated the transcriptional activity of the wnt pathway was much higher in the GFP-ABC-expressing cells than in the GFP-β-catenin and empty-vector transfected cells. We verified the pEGFP-ABC-transfected cells exhibited a notably greater capacity for in vitro invasion in contrast to both pEGFP-β-catenin and pEGFP-transfected cells. Furthermore, immunohistochemical analysis of 30 clinical pediatric OS specimens revealed a strong correlation between high ABC levels and metastasis at diagnosis and resection. Additionally, 3D OS spheroids cultures showed that ABC induce greater numbers and length of cellular extensions (invadipodia) compare to spheroids from β-catenin- and empty-vector- transfected cells.

Conclusions:
According to these findings, ABC may be a sign of locally aggressive or metastatic OS and might activate transcription to encourage a more invasive phenotype.

Mya A. Schmidt, Yasser Abuetabh, Heidi Silver, Matthew Martens, Shubham Soni, Jason R.B. Dyck. ***Investigating the Role of Ketones in Regulating Inflammation***

Introduction:
Ketone bodies are small, energy-rich molecules synthesized primarily by the liver. They are particularly important during periods of fasting, low carbohydrate intake, or increased metabolic demands. In lieu of glucose, the brain and heart can shift to rely primarily on ketones to meet their energetic needs. Emerging research has revealed that the most abundant ketone body, beta-hydroxybutyrate (βHB), not only functions as a key metabolic substrate but also exerts anti-inflammatory signaling properties, via inhibition of the NLR family pyrin domain containing 3 (NLRP3) inflammasome. Whilst it has been demonstrated that βHB supplementation is beneficial in various rodent models of inflammatory diseases, it remains unknown whether ketones are a fundamental necessity for the body to properly balance and safeguard inflammation from reaching harmful levels, or if sex differences play a role in their anti-inflammatory effects.

Methods:
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Results:
We demonstrate that healthy female mice have significantly higher levels of hepatic 3-hydroxybutyrate dehydrogenase 1 (BDH1) protein expression than healthy males, which coincides with our finding that they have significantly higher fasted blood βHB levels than males. Additionally, we show that HMGCS2 KO in the liver results in an upregulation of HMGCS2 expression in the kidneys. Interestingly, we discovered that healthy wild-type females have significantly higher renal HMGCS2 expression than males. Currently, we are exploring whether females are more protected from LPS-induced damage to the kidneys and other organs due to the observed sex differences in ketone dynamics. Moreover, we will continue to investigate whether the loss of circulating ketones exhibited in our knockout model exacerbates the inflammatory response and aggravates multi-organ injury induced by LPS.

Conclusion:
The results of this research will enhance our understanding of the body's endogenous anti-inflammatory mechanisms and determine whether ketones are indeed a homeostatic regulator of inflammation. Ultimately, this work will help inform the utility and clinical implementation of ketone-centric therapies, such as exogenous supplements and SGLT2 inhibitors, in treating inflammatory disorders.

Sela Scott, Elise Kammerer, Larissa Lecona, Stephanie Nitschke, Kristen Gibson, Pam Thompson, Daniel Ofosu, Dacia Chiarieri-Hirsch, Michael Van Manen, Lesley Soril, Maria Castro-Codesal. ***Caregiver-informed meta-synthesis of caregiver's experiences with tracheostomy decision-making***

Introduction:
With advancements in healthcare practices and technology, many children survive critical illnesses, resulting in the need for long-term ventilation support through a tracheostomy.

Methods:
We systematically searched qualitative literature on caregiver decision-making for tracheostomy. Studies based on the following a priori criteria were included: 1) children 0-18 years; and 2) qualitative research describing caregivers' experiences with tracheostomy decision-making. Two independent reviewers applied the inclusion criteria and conducted the data extraction of included studies. We conducted line-by-line coding from using NVivo before creating descriptive and analytic themes. Meta-synthesis methods were used including grouping and recategorizing themes and using categories for analysis and synthesis into a new narrative. We then engaged caregivers with experience in tracheostomy decision-making to find meaning in the results, complement with their lived experiences, to ensure a coherent narrative beyond the contributions of each study's findings.

Results:
Eighteen studies were included in the data extraction process. Two main categories for decision-making were identified: (1) making the decision for tracheostomy, and (2) continued decision-making process during their child's hospital journey. The first category included themes of emotional and psychological experiences, questions about the child's care, the level of involvement from the healthcare team, and the hope/ values of caregivers. The second category included themes such as taking on a new role, financial uncertainties, navigating relationships with spouses, family, and friendships, and the transition from the hospital to home. In discussions with caregivers with lived experience of tracheostomy decision-making, many emphasized how pivotal the initial decision for tracheostomy was but the decisions that follow were much more important with what it means to become a caregiver for your child. These same caregivers wished for holistic support from a multidisciplinary healthcare team to guide them through the realities of caring for a child with tracheostomy. Although providing medical care for their child is one new aspect of caregivers' lives that must be learned, all of the other decisions and changes that follow are rightfully important and arguably more life changing.

Conclusion:
For caregivers, tracheostomy decision-making is a complex and highly emotional journey that begins with and continues beyond tracheostomy placement. Adequate holistic support and timely information for these families are key to helping these caregivers navigate their child's journey. Only through engagement of caregivers with live experiences we ensure that this new narrative is created by caregivers from caregivers' information

Raj T. Somasundaram, Ghada Aborkhees, Jihong Lian, Amy J. Barr and Lesley G. Mitchell Thrombosis. ***Pediatric neuroblastoma cells constitutively express hemostatic factors: A novel approach to neuroblastoma metastasis.***

Introduction:
Neuroblastoma is the most common childhood solid tumor and accounts for 15% of childhood cancer deaths. The majority of children with neuroblastoma have metastasised tumors at time of diagnosis. Importantly, over 50% of children will die when diagnosed with tumor metastasis. Cancer cells metastasise by traveling throughout the body in the bloodstream. Our team is investigating a novel mechanism of tumor metastasis whereby tumor cells form a blood clot in order to construct a "cloak" allowing them to move in the bloodstream evading shear forces and the immune system. Blood clots form by a complex series of activation of serine proteases involving hemostatic factors present primarily in the bloodstream. We hypothesize that tumor cells can initiate/accelerate formation of blood clots by endogenously producing hemostatic factors. To explore this hypothesis, we studied pediatric neuroblastoma cell lines from primary tumor cells, and terminally metastasised secondary tumor cells to determine expression of hemostatic factors at the gene and protein level.

Methods:
Three pediatric neuroblastoma cell lines derived from primary and secondary tumors were selected for this study. IMR-32, a primary tumor cell derived from an abdominal mass of a 13-month-old male. SH-SY5Y and SK-N-DZ are secondary tumor cells from terminally metastasised to bone marrow and were obtained from a 4-year-old female and a 2-year-old female respectively. RT-qPCR (TaqMan®) and immunoblotting were utilized to detect gene and protein expression of the hemostatic factors.

Results:
Of the 30 hemostatic factors screened we report for the first time, gene expression of numerous hemostatic factors, including: Tissue Factor, Factor-VIII, Factor-II-Receptor, Protein-S, Protein-C-Receptor, Thrombomodulin, ADAMTS13, tPA and PAI-1 in all 3 cell lines. Preliminary immunoblotting data supports gene expression results. We found that primary tumor cells, when compared with secondary tumor cells, exhibit increased level of gene expression in the procoagulant pathway and decreased level of gene expression levels in the fibrinolytic pathway.

Conclusion:
Our comprehensive screening of hemostatic factors on neuroblastoma cell lines is the first to report expression of hemostatic factors at the gene and protein level. Production of hemostatic factors may contribute to the metastatic capacity of these cells. Primary tumor cells compared to secondary tumor cells have more ability to form a cloaking mechanism suggested by increased expression in procoagulation factors. Secondary tumor cells compared to primary tumor cells have increased expression of fibrinolytics, which have been shown to aid in tumour establishment at secondary sites.

Ricardo G. Suarez Suarez, Daniel G. McClement, Hein Huynh , Anne Griffiths , Ayub Shaikh, Anthony Otley , Kevan Jacobson , Mary Sherlock , Colette Deslandres , Wael El-Matary , Jennifer deBruyn , Thomas Walters , Eytan Wine. ***Applying Machine Learning to Predict Exclusive Enteral Nutrition Therapy Response in Pediatric Crohn Disease Patients***

Introduction:
Current treatments for IBD focus on reducing inflammation, mostly through suppression of the immune system. Exclusive enteral nutrition (EEN) is recognized as the first line therapy for mild-to-moderate luminal pediatric Crohn disease patients pCD. Although EEN is safe, as it does not suppress the immune system, it poses considerable challenges to patients, mostly due to palatability and monotony of the formula and treatment costs. Moreover, the efficacy of EEN varies greatly from patient to patient. Therefore, there is a need to distinguish between responders and non-responder patients.

Methods:
The Canadian Children Inflammatory Bowel Disease Network (CIDsCaNN) prospectively enrolled and followed new onset pediatric IBD cases. Prospective data for 308 pCD with EEN as their first treatment for CD are available. Patients with weighted Pediatric CD Activity Indexes (wPCDAI) collected after at least 4 weeks on EEN were compiled into a dataset (n=108). For this analysis, treatment response was defined as a wPCDAI reduction of at least 12.5 points of a patient's wPCDAI baseline score.
The dataset includes 26 features for each of the 108 pCD patients at time of diagnosis. This included blood test results (Hgb, ESR, CRP, Alb, Htc, Plt), Paris Classifications, height, and weight Z-scores, as well as wPCDAI, SES-CD (simple endoscopic score, CD), PGA (physician global assessment), and Mayo scores.
Odds ratios were calculated to determine whether any features were associated with response to EEN induction therapy. Then, the most relevant features were identified with regularization techniques and a machine learning classifier for predicting response to EEN was built.

Results:
Results showed that the appropriate subset of features to include for optimal accuracy over model simplicity are n=4 (PGA, SES-CD scores, CRP, and hematocrit). Also, an increase in PGA score (e.g., moving from "mild disease" to "moderate disease") was associated with an increase in the chance of EEN failure (Odds Ratio 3.1, 95% CI [1.7,5.8], p=0.0001). The best classifier for predicting EEN response was a random forest consisting of 20 decision trees. The classifier achieved an area under the ROC curve of 0.75.

Conclusions:
Our results suggest that it is possible to produce a classifier capable of predicting EEN clinical remission with an accuracy over 60%. Higher PGA and SES-CD scores show potential for predicting patients less likely to respond to EEN induction. This research has the potential to provide a better quality of life for children who live with IBD.

Rebecca Tan, Peter Zhao, Todd Alexander. ***Calcium-sensing receptor signaling is amplified in patients with a FAM111A gene mutation***

Introduction:
A six-year-old female was diagnosed with Autosomal Dominant Hypocalcemia (ADH), a childhood disorder characterized by low blood Ca2+ and low parathyroid hormone (PTH). She had no mutations in genes known to cause ADH (Ca2+-sensing receptor (CASR) and G-protein subunit alpha 11 (GNA11)). Whole exome sequencing and trio analysis identified a novel FAM111A gene mutation (c.1454G>A,p.C485Y). Although FAM111A is a protease, the specific protein targets are unknown. Interestingly, FAM111A mutations cause Kenny Caffey syndrome (KCS) and Osteocraniostenosis (OCS), conditions characterized by low blood Ca2+, low PTH, and bony abnormalities. The molecular mechanism mediating these phenotypes are unknown. We hypothesize that FAM111A mutations cause increased CASR signaling, resulting in low blood Ca2+ and high urine Ca2+. CASR is a G-protein coupled receptor, which upon activation by extracellular Ca2+, initiates signaling cascades that increase intracellular Ca2+ and decrease cAMP. CASR activation also increases expression of tight-junction protein, claudin-14 (CLDN14). Kidney CLDN14 blocks Ca2+ reabsorption, causing increased urine Ca2+ and lowers blood Ca2+. Our objective was to determine if FAM111A wild-type (WT) suppresses CASR signaling and if mutants fail to do so.

Methods:
Human embryonic cells were transfected with empty vector (EV), CASR and EV, FAM111A WT with EV, or CASR and FAM111A WT or mutants (C485Y-ADH; Y511H-KCS; R569H-KCS; T338A-OCS; P527R-OCS; D528G-OCS; S541A-inactivated protease). We performed Fura2AM cell-imaging of intracellular Ca2+ in the presence of increasing extracellular Ca2+ (0.5-11.3 mM). Also, as an indication of CASR activity, we measured CLDN14 and cAMP, in cells incubated in 0.5 mM or 5 mM extracellular Ca2+, via a dual luciferase assay and cAMP assay kit, respectively.

Results:
Intracellular Ca2+ was two times higher ($p<0.05$) in cells with CASR plus EV or FAM111A mutants, compared to EV or FAM111A WT plus CASR. Similarly, CLDN14 was higher ($p<0.05$) in CASR plus EV compared to EV and FAM111A WT plus CASR. Some mutants (C485Y, T338A, P527T, D528G, S542A) had similar CLDN14 to CASR plus EV, while others (Y511H, R569H) showed similar levels to FAM111A plus CASR. Cells with FAM111A WT or mutants did not differ in cAMP.

Conclusions:
FAM111A WT attenuates CASR activity. All FAM111A mutations, enhanced CASR activity when measured by an increase in intracellular Ca2+. Some mutants increase CLDN14, while others may affect a different CASR signaling pathway. Elucidating the mechanism of how FAM111A affects CASR activity and Ca2+ homeostasis will provide a better understanding of our patient's condition as well as those with KCS or OCS.
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Flavio T. Vieira, Camila E. Orsso, Nandini Basuray, Faria Ajamian, Reena L. Duke, Daniela A. Rubin, Geoff D. C. Ball, Catherine J. Field, Carla M. Prado, Andrea M. Haqq.
Less Impulsive Behavior is Associated with a Healthier Dietary Intake and Improved Cardiometabolic Profile in Adolescents with Obesity

Introduction:
Delay discounting (DD) represents the decline in the present reward value in proportion to the time to receive it and influences decision-making. Individuals who prefer smaller rewards immediately versus larger rewards in the future have higher rates of DD. Higher rates of DD are more likely to be associated with choice impulsivity and impulsive behavior, thus increasing unhealthy behaviors and obesity development. We aimed to evaluate the rate of DD in adolescents with obesity, and to investigate whether DD influences the dietary intake (DI) and the cardiometabolic profile.

Methods:
We included individuals with a BMI≥95th for age/sex and aged 10-18 years. A computer-based 5-trial adjusting task assessed the DD using 5 hypothetical forced-choice statements (e.g., $10 now vs. $20 in 3 weeks). DD measures included κ and effective delay 50% (ED50%); higher κ and lower ED50% means more impulsive behavior. DI was assessed from 3-day food records, while diet quality (DQ) was calculated using the Healthy Eating Index-Canadian adaptation, with subscores for whole grains and unhealthy foods. Blood markers included glucose, insulin, lipid panel, and C-reactive protein. We compared the DI, DQ, and cardiometabolic markers between individuals above and below the ED50% median distribution, and results expressed as median and interquartile range. Linear regression analyses were performed between DD measures, DI, DQ, and cardiometabolic markers, adjusted for sexual maturation (pre-early vs. mid-late).

Results:
Thirty-nine participants (BMI z-score 3.1±1.0, age 12.7±2.0 years, 56.4% female) were included. DD did not differ between sexes and pubertal stages. Compared to those below the ED50% median, individuals above the median presented higher protein intake (1.1g/kg [0.9,1.6] vs. 0.8g/kg [0.7,1.1], p=0.012), lower carbohydrate intake (45.6% [40.6,50.8] vs. 52.4% [48.7,56.8], p=0.006), with higher whole grain score (3.4 [3.0,4.6] vs. 0.9 [0,2.8], p=0.002), and better lipid profile (cholesterol: 3.5mmol/L [3.2,4.1] vs. 3.9mmol/L [3.7,4.6], p=0.015; LDL-c: 1.9mmol/L [1.7,2.5] vs. 2.4mmol/L [2.1,2.8], p=0.006), despite higher fat intake (35.6% [32,39.1] vs. 32.2% [27.2,34.0], p=0.015). A less impulsive behavior was associated with lower total cholesterol (R2=0.14, ß=−0.004, p=0.029), LDL-c (R2=0.21, ß=−0.003, p=0.006), and triglycerides (R2=0.20, ß=−0.005, p=0.019). Lower impulsivity predicted a healthier DI, with higher protein intake (R2=0.36, ß=0.001, p=0.033) and lower consumption of unhealthy foods (R2=0.11, ß=−5.23, p=0.042).

Conclusions:
Less impulsive behavior, evaluated using DD methodology, was associated with a healthier DI and cardiometabolic profile in adolescents with obesity. Despite higher fat intake, this was still within recommended ranges. No differences regarding DD were observed between sexes and pubertal stages.

Amberley Trigg, Nazanin Arjomand Fard, Christopher Cheng, Deenaz Zaidi, Eytan Wine.
The effect of indole-3 propionic acid on potential pathobionts isolated from non-inflamed sections of pediatric patients with Inflammatory Bowel Diseases

Introduction:
Indole-3 propionic acid (IPA) is a tryptophan metabolite that has been shown to ameliorate inflammation, intestinal integrity, and microbial dysbiosis. Previous studies have examined the effect of IPA in murine models; however, the in vitro mechanisms of action at above physiologic concentrations have not yet been described. In this study, we aimed to examine the effect of 1.0 mM IPA, above the physiologic concentration of 1-10 μM IPA. We hypothesized that a higher concentration of IPA will further decrease bacterial invasion, improve tight junctions, and decrease pro-inflammatory cytokine production.

Methods:
Two bacterial strains, Klebsiella variicola (from peri-appendicular region) and Klebsiella pneumoniae (from ascending colon), isolated from the uninflamed bowel of pediatric patients with ulcerative colitis were used to infect Caco-2 cells (human colonic epithelial cell line) in various experiments. Caco-2 cells were treated with 1.0 mM IPA overnight. Gentamicin protection assay was used to assess bacterial invasion, transepithelial electrical resistance (TEER) was measured to evaluate intestinal integrity, and quantitative polymerase chain reaction (qPCR) was performed to quantify gene expression of the pro-inflammatory chemokines and cytokines including interleukin (IL)-8, and tumor necrosis factor alpha (TNF-α), as well as the anti-inflammatory cytokine IL-10.

Results:
Gentamicin protection assay demonstrated a significant increase in the invasion of K. variicola with the addition of IPA, while no significant difference was observed in IPA-treated K. pneumoniae invasion. TEER values were not significantly different between no IPA and IPA-treated groups. Preliminary results for qPCR suggest a significant decrease in expression of IL-8, IL-10, and TNF-α for K. variicola treated with IPA. Current experiments in progress include enzyme-linked immunosorbent assay (ELISA) to demonstrate the protein expression of IL-8, IL-10, and TNF-α.

Conclusions:
Higher concentration of IPA exhibits variable effects on the intestinal barrier and must be further elucidated before being considered as a treatment option for pediatric inflammatory bowel disease patients. Notably, 1.0 mM IPA was found to increase bacterial invasion and lower pro-inflammatory cytokine expression in K. variicola. Future work will explore the impact of IPA on the other aspects of the invasion potential of the bacteria, including biofilm formation and adhesion experiments.

Janelle Trombley, Catherine Sheppard, Gurpreet Khaira, Daniel Garros, Colin Wilbur.
Influenza-Associated Acute Necrotizing Encephalopathy of Childhood: A Case Series

Introduction:
Acute necrotizing encephalopathy of childhood (ANEC) is a rare central nervous system complication of viral and bacterial infections – classically influenza – characterized by acute alteration of consciousness, characteristic neuroimaging findings, and a high morbidity and mortality. The pathophysiology is believed to relate to cytokine storm and early treatment with immunotherapy is recommended to optimize outcomes, although the rarity of the condition means that early recognition is challenging and the evidence for specific therapies is very limited.

Methods:
Three Influenza A positive children with possible ANEC were identified through the neurology and critical care services at the Stollery Children's Hospital during the 2023 fall/winter influenza season. A retrospective chart review and descriptive analysis was performed on these patients.

Results:
Three children aged 2 - 8 years old presented to the emergency department with decreased level of consciousness following a 1- 5 day history of cough, rhinorrhea and fatigue. Two children had seizures with their initial presentation. All patients were Influenza A positive and had not received the current seasonal influenza vaccine. Features suggestive of ANEC were observed on magnetic resonance imaging (MRI) in two patients, while the third evolved brainstem and thalamic infarction along with diffuse cerebral edema on computed tomography and did not proceed to MRI. Immune therapy was commenced between day one and three of admission and included: pulse steroids and IVIG and tocilizumab, pulse steroids and plasma exchange, and pulse steroids and intravenous immunoglobulin (IVIG). One child died on day 6 of admission despite early initiation of immune therapy. The second child was transferred for inpatient rehabilitation after 13 days in hospital, ambulating with supervision. The third child, who began immune therapy on day three, was discharged home after 35 days in hospital not yet ambulating independently.

Conclusions:
A cluster of three possible ANEC cases identified at the Stollery Children’s Hospital in late 2023 are described. Presenting features were non-specific and early neuroimaging was key to a timely diagnosis. We identified variability in treatment regimens and clinical outcomes. While the small case series limits our ability to draw conclusions between treatment choices and outcomes, there is a need to develop a consensus approach to the investigation and management of children with possible ANEC.

Osnat Wine, Vera Caine, Deborah McNeil, Matt Hicks. ***Establishing rooming-in care program for parents and babies with Neonatal Abstinence Syndrome: The context of a Team.***

Introduction:
Keeping mothers and infants together (vs separation in NICU) is an evidence-based approach for supporting mothers involved in substance use during pregnancy and babies at risk of Neonatal Abstinence Syndrome (NAS). Implementation of this model of care is complex and challenging, requiring buy-in from administration and staff, as well as resources and education to shift established practices and culture. Using the lens of team science provides insights on building effective implementation teams within and across sectors and the processes that make change possible. We illustrate essential team processes and conditions that contributed to a rooming-in program initiation and success.

Methods:
Through a case study we inquired into a program that offers NAS care for families through rooming-in and wrap-around supports. We explored the processes and essential components involved in the team's collaborative journey of establishing the program. The Collaborative Research Framework and the Consolidated Framework for Implementation Research informed data collection and thematic analysis to learn about the essential team contexts. We conducted semi-structured interviews with the champions and founders of the program, as well as observed and reviewed team meetings and program documents.

Results:
The program was informed by emerging evidence and aligned with the hospital mandate of promoting social justice and equity. At the heart of implementation was a dedicated, committed, and passionate core team with strong relationships across stakeholders. Growth of the program involved extending the team involved in change processes and engaging in co-learning with staff and adminstartion, which contributed to establishing buy-in. Processes focused on joint capcity building, expanding individual knowledge and shifts in attitudes to reduce bias and stigma to provide hopeful and evidence-informed care. It was essential for implementation to establish trust between families and staff, expand partnerships with parents and community supports, and develop joint responsibility with those involved and those most impacted by the program. Observing success was crucial for progression in this context. Additionally, the core team was attentive to stakeholders' needs and led change through constantly supporting staff and families and engaging in inclusive reflective practices.

Conclusions:
Success is reflected in the number of patients impacted, the associated cost savings, and the significance of providing meaningful, ethical, and hopeful care for families who experience structural vulnerabilities. The journey to establish this NAS care model is complex and requires attention to team contexts, which include team processes and dynamics.

Viktoria Wuest & Sukhmani Kaur Saggu, Christine Wiebe Buchanan, Adelee Penner, John Waterhouse, Jacqueline Pei, Carmen Rasmussen. ***Evaluating Classroom-Wide Implementation of the Math Interactive Learning Experience Program***

Introduction:
The Math Interactive Learning Experience (MILE) program is an evidence-based learning intervention that supports the development of underlying cognitive skills critical for strengthening foundations in math while also fostering emotional and behavioural regulation. MILE encourages teachers to understand their students' specific challenges by examining students' computation errors and building skills through fun hands-on activities. The MILE program has established efficacy in improving both math and regulation skills in students with neurodevelopmental difficulties when used in individual and small-group settings. Our team adapted the MILE program for classroom-wide use with all students by educational experts. The goal of the current study was to examine the efficacy of the MILE program when administered classroom-wide by educators. Specifically, we examined changes in educator mathematics teaching self-efficacy and student math performance outcomes after participating in MILE.

Methods:
The updated MILE program was implemented by 16 educators across Alberta during the 2022-2023 school year. Educators from four rural school divisions completed approximately six hours of MILE training and then implemented MILE in their classrooms over 2-3 months. An estimated 400-500 children across grades 1-5 were impacted by the MILE program. Educators completed the Mathematics Teaching Efficacy Beliefs Instrument (MTEBI) before and after implementing MILE. Student math outcome data was provided by one participating school division.

Results:
After completing MILE, educators reported a significant increase in their mathematics teaching self-efficacy, and in their belief that their math instruction would lead to greater student math achievement. Students exposed to the MILE program experienced a statistically significant change in math scores throughout the school year, with the largest gains seen in grade 4.

Conclusions:
The results provide evidence that the MILE program continues to remain efficacious when implemented classroom-wide with students with diverse learning needs. In addition to supporting math achievement among elementary school students, this study also established that the MILE program is effective in increasing educator math teaching self-efficacy, which may also positively impact student math performance. Overall, educators gave positive feedback for the updated MILE program, providing evidence that the MILE program can be a positive addition to educators' teaching practices.

Elizabeth Yan, Mary Baumann, Leanne Meakins, Aisha Bruce, Joel Livingston. ***Early Resolution of Neonatal and Infant Venous Thrombi: A Retrospective Review from the Stollery Children's Hospital from 2003 to 2013***

Introduction:
Neonates and infants who develop venous thromboembolism (VTE) are often treated with anticoagulation for up to 3 months as per the most current American Society of Hematology guidelines. However, anticoagulation is not without risk, and treating for the shortest duration to achieve clot resolution would be optimal. Previous studies suggest that shorter courses of anticoagulation (i.e., ≤ 6weeks) are sufficient for thrombus resolution in children. Due to differences in developmental hemostasis, neonates and infants may require even shorter therapy. Therefore, standard practice at the Stollery Children's Hospital KidClot program since 2003 has been to re-image patients aged ≤ 90 days within 2 weeks of starting anticoagulation for VTE.

Objective:
To review rates of thrombus resolution at ≤ 2 weeks in neonates and infants (age ≤ 90 days) treated by the KidClot program.

Methods:
A retrospective review of patients aged ≤ 90 days with VTE treated by KidClot Jan. 2003 – Dec. 2013 was conducted. Data was extracted for patients with ≥1 VTE and started on anticoagulation therapy. Patients without follow-up imaging onsite (e.g., transferred to another hospital or jurisdiction) and those with solely arterial, superficial vein, portal vein and/or renal vein thrombi were excluded. Data on patient age, provoking factor(s), anticoagulation type(s), thrombus size/location was collected. Outcomes included thrombus resolution on imaging within 3 months and long-term recurrence on up to 10-years post-therapy. The study was approved by the Human Research Ethics Board – Health Panel at the University of Alberta under the ID: Pro00136321.

Results:
One-third (29/87) of patients ≤ 90 days old had full resolution of VTE after ≤ 2 weeks of therapy. In total, 41/87 had full and 19/87 had partial clot resolution by ≤ 3 months of anticoagulation. Sub-analysis of VTE resolution based on provoking factors (e.g., history of a central line), site of VTE (upper versus lower limb) are included along with data on long-term recurrence on imaging up to 10-years post-therapy.

Conclusions:
Results suggest a high rate (> 30%) of VTE resolution within 2 weeks of anticoagulation therapy for patients aged ≤ 90 days. While further study is needed, this supports early follow-up imaging and cessation of anticoagulation may be warranted in this age group to reduce risks of anticoagulation.

Zafrani RN, Fernando DN, Gokiert R, Ho J, Williamson D, Buchholz A, Dettmer E, Geller J, Vallis M, Ball GDC. ***Motivation in Pediatric Obesity Management: A Scoping Review Protocol***

Introduction:
Motivation plays a crucial role in successfully managing pediatric obesity, as low motivation can lead to ineffective treatment and attrition. Thus, it is vital to assess motivation to provide tailored interventions, addressing individual patient needs. Currently, a standardized approach for assessing motivation in pediatric obesity management is lacking. This scoping review will (i) explore the conceptualizations of motivation used in pediatric obesity and (ii) identify the ways motivation is measured in pediatric obesity management.

Methods:
This scoping review will be conducted referencing the Joanna Briggs Institute methodology for scoping reviews and reported according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extensions for scoping reviews. Medline, PsycINFO, CINAHL, Web of Science, and ProQuest will be systematically searched from January 1946 to March 2024 for publications that (i) measure motivation in children and adolescents (0 – 18 years old) living with overweight and obesity; (ii) measure motivation in parents and caregivers of children and adolescents living with overweight and obesity; and (iii) are published in English or Spanish. We will exclude publications that measure motivation in adults (>19 years old), parents, and caregivers if they are the focus of the weight management. Two independent reviewers will select and extract the data, which will be analyzed descriptively and analytically by providing summaries and mapping of the included studies.

Anticipated results:
We anticipate finding trends associated with the different concepts of motivation and how motivation is measured in children and adolescents living with overweight and obesity and their parents and caregivers.

Conclusions:
This scoping review will provide an overview of the literature on motivation and how motivation is measured in children and adolescents living with overweight and obesity, with the aim of clarifying the concept. The findings of this study will be invaluable for developing a framework or model that will assist in defining and understanding motivation in pediatric obesity and help shape the future direction of research on motivation.