

CELEBRATE RESEARCH DAY

April 12th, 2024
The Chan Centre for Family
Health Education



a place of mind



The University of British Columbia
Department of Pediatrics
Faculty of Medicine



An agency of the Provincial
Health Services Authority

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Dr. Steven Miller, Head of Department of Pediatrics



Dear Trainees and Faculty,

I am thrilled to extend a warm welcome to you all to the 2024 Annual Department of Pediatrics Celebrate Research Day.

Today is dedicated to celebrating the endeavors of our trainees and their mentors, advancing child health through research.

We find ourselves in an era filled with unprecedented opportunities for research breakthroughs to enhance child health. Whether through basic science, translational research, clinical investigations, health services research, or other innovative approaches, the potential for impactful discoveries is vast.

It is crucial to recognize that these discoveries hinge upon the dedication of investigators like yourselves. The Department of Pediatrics remains committed to nurturing early-career child health researchers, ensuring the continuity of this remarkable era. Moreover, we are dedicated to fostering the growth of the next generation of pediatricians, providing them with opportunities to engage in research and pursue their own projects as part of their training.

An inspiring development in recent years has been the translational research at the intersection of our various subspecialties. This growth has been made possible by new collaborations and the advent of new technologies that support both clinical and basic research endeavors.

As residents and fellows presenting your research at Celebrate Research Day, you also embody a crucial link between our patients and their families, and researchers.

On behalf of the Department of Pediatrics, I extend my heartfelt congratulations to each of you on your research achievement today. I am confident that the impact of your work will directly contribute to advancements in child health. The future looks promising.

Warm regards,

Dr. Steven Miller

Professor of Pediatrics

Head, Department of Pediatrics

Special Thanks

Our heartfelt thanks to the Pediatric Residency Research Committee, and Celebrate Research Day Judges 2024 for their support and dedication!

Dr. Jonathan Rayment
Respiratory Medicine,
BC Children's Hospital



Dr. Brett Schrewe
Island Medical Program &
Department of Pediatrics, UBC
Faculty of Medicine, Victoria, BC



Dr. Thiviya Selvanathan
Pediatrics, UBC Faculty of Medicine



Dr. Carolina Silva
Pediatric Endocrinology,
BC Children's Hospital



Dr. Lori Tucker
Pediatric Rheumatology,
BC Children's Hospital



Conducting Effective Research Sessions for Trainees

0905-0945AM

A Sense of the Subject—Education Research & the Dogged Pursuit of Hospitable, Equitable Health Care

Dr. Brett Schrewe, MDCM, MA, PhD, FRCPC
Assistant Professor, Island Medical Program &
Department of Pediatrics, UBC Faculty of Medicine, Victoria, BC

Brett lives, works, and is raising his two daughters on southern Vancouver Island, on the ancestral and traditional territory of the *W̱SÁNEĆ* people, land governed by the South Saanich Treaty of 7 February 1852. He splits his professional time between clinical life as a consultant general pediatrician in Victoria and academic life as an education scientist jointly appointed between the UBC Island Medical Program and Department of Pediatrics. His research uses critical and historical approaches to knowledge making and focuses primarily on the intersections of professional identity, health equity, and medical education.



0945-1045AM

Statistical Methods Every Resident Should Know

Mr. Jeffrey Bone
Biostatistical Lead, Clinical Research Support Unit
BC Children's Hospital Research Institute

Jeff Bone is the Biostatistical Lead at BC Children's Research Institute. Within his role, he supervises a team of biostatisticians who support research activities across the campus. Together with his team he provides expertise in the design, conduct and analyses of projects including studies of population level data, randomized clinical trials, and multi-center cohort studies. He has expertise in a variety of statistical methods such as causal inference for observational data, clinical prediction modeling and meta-analyses.



Conducting Effective Research Sessions for Trainees

1045-1130AM

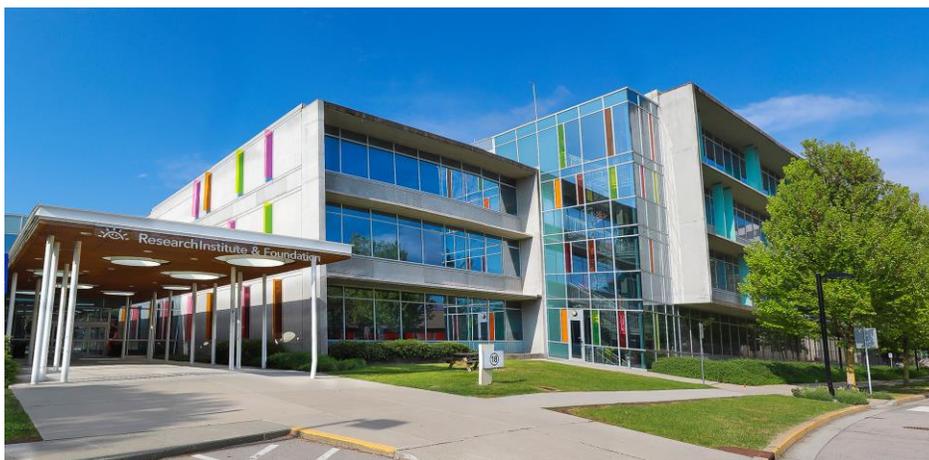
Navigating BCCHR: An Introduction to Research Resources

Ms. Ashley Biggerstaff, Ms. Jennifer Claydon

BC Children's Hospital Research Institute

BC Children's Hospital Research Institute (BCCHR) conducts discovery, translational, and clinical research to benefit the health of children and families in BC and beyond. Pediatric Residents affiliated with BCCHR have access to dedicated and specialized support staff, state-of-the-art facilities and training to support the next generation of visionary child health researchers.

The Clinical Research Support Unit (CRSU) at BCCHR enables busy clinical trainees to conduct high-quality clinical research offering a central resource of expertise and knowledge. CRSU offers several practical resources and supports from free consultations, advice and guidance to help clinicians navigate the research process, to the ability to buy-out time from professional research staff working across the hospital helping to start-up new studies or completing study visits with patients and families.



1200NOON – 1300PM

Bedside to Bench and Back to Bedside – a Research Journey

Dr. Stuart Turvey, MBBS Dphil FRCPC

Canada Research Chair in Pediatric Precision Health

Aubrey J. Tingle Professor of Pediatric Immunology

Professor, The University of British Columbia

Stuart Turvey is a Pediatric Clinical Immunologist, UBC Professor of Pediatrics, and holder of the Tier1 Canada Research Chair in Pediatric Precision Health. As a practising pediatric immunologist based at BC Children’s Hospital, Dr. Turvey’s research program responds to major challenges in contemporary pediatric medicine. Specifically, his research focuses on childhood immune deficiency diseases and disorders of immune dysfunction including asthma, allergies, and autoimmunity. Dr. Turvey is internationally recognized for his research in developing precision health-based strategies to address childhood asthma and pediatric immune system disorders, and he is a highly effective mentor for the next generation of child health clinician-scientists.



Dr. Sean Duke / Ped Resident (PGY 3)

Faculty Supervisor: Dr. David Wensley

Evaluation of Child Health Advice in Real-Time Electronically (CHARLiE) in Northwestern BC

Dr. Sean Duke, Dr. Jenna Treissman, Dr. Shannon Freeman, Dr. Emma Rossnagel, Dr. Salima Somani, Dr. Alam Lakhani, Dr. Kirsten Miller, Dr. John Pawlovich and Dr. David Wensley

BACKGROUND

To improve access to pediatric care for children living in rural, remote and Indigenous communities, the RccBC developed CHARLiE, a 24/7 real-time virtual support pathway providing pediatric consultation via videoconference. Due to unforeseen circumstances in the Fall of 2020, the Pediatrician group in Terrace (the regional referral center for Northwestern BC) was reduced to just two local pediatricians. In response to a local community leader's proposal, CHARLiE has covered up to 25% of the pediatric call burden in Northwestern BC.

OBJECTIVES

To evaluate the integration of CHARLiE into the pediatric call rotation and thereby improve upon CHARLiE's implementation.

METHODS

Pediatric healthcare providers in Northwestern BC participated in surveys (N=72) and focus groups (N=39) to share their experiences with participating in a healthcare model that incorporates virtual Pediatric consultants in lieu of adequate local Pediatrician coverage. Descriptive statistics were drawn from survey data, while themes were generated from a qualitative descriptive approach to focus group transcripts.

COMMUNITY ENGAGEMENT

Community stakeholders (e.g. clinicians, healthcare administrators) were engaged to formulate survey and focus group content tailored toward the unique strengths/challenges of providing pediatric care in Northwestern BC.

RESULTS

Survey responses indicated that the majority of CHARLiE users were "satisfied" or "very satisfied" with the overall support provided by CHARLiE, user friendliness (94.2%), efficiency (90.4%), collegiality and professionalism (96.1%), assessment of patients (90.4%), and provision of education around cases (88.4%). Of respondents who had not used CHARLiE, the most frequently reported barrier was lack of necessary resources to access CHARLiE (54.5%). Focus group analysis revealed that Pediatric care providers within Northwestern BC value CHARLiE's timely, virtual bedside assessments of patients; collegiality and professionalism; prevention of local Pediatrician burnout; prevention of unnecessary transfers; and offloading of indirect patient care tasks. Areas of improvement include addressing technological barriers, knowledge of local resources, continuity of care, and role clarification.

CONCLUSIONS

Rural physicians benefit from offloading indirect patient care tasks to CHARLiE consultants (e.g. consulting Pediatric subspecialists, organizing transport) which gives local physicians more time at the patient bedside for assessment/stabilization. While unable to replace local specialists, virtual consultants can effectively bolster existing personnel/resources during times of crisis. Although a full complement of on-the-ground Pediatricians remains the ultimate goal for Northwestern BC, in the absence of this, CHARLiE plays a crucial role in ensuring access to pediatric care in Northwestern BC.

Residents Oral Presentations

Dr. Jessica Falls/ Ped Resident (PGY 4)

Faculty Supervisor: Dr. Shawn George

Improving breastfeeding outcomes for preterm infants in Mother Baby Care

Dr. Jessica Falls, Dr. Shawn George, Sarah Coutts

BACKGROUND

Many families desire to breastfeed their preterm infant, which can have unique challenges compared to term infants. One milestone for preterm infants is to transition from tube feeding to direct breastfeeding. Babies discharged from BC Women's Mother Baby Care (MBC) Unit have low rates of direct breastfeeding based on previously reviewed data. The cause of this is unclear, though variation in healthcare provider practices around breastfeeding, inconsistent neonatal feeding practices during transition from tube to oral feeding, and a lack of evidence-based information shared with families have been noted as potential causes to lower rates of direct breastfeeding at discharge. Currently, there is no standard approach to establishing oral feeds and transitioning preterm infants from tube feeding to breastfeeding in MBC.

AIM

The aim of this quality improvement project was to enhance direct breastfeeding rates of preterm infants (<37 weeks) in the MBC unit. Our goal was to increase the rate of any direct breastfeeding in the 24 hours preceding discharge from 35% to 80%.

METHODS

We determined underlying issues and change strategies to enhance breastfeeding experiences and outcomes. We collected baseline data and conducted staff surveys. Baseline surveys showed current healthcare provider practices and beliefs. We then established a multidisciplinary team to generate and prioritize change ideas. We also secured leadership support and heightened staff education.

Our approach included a comprehensive care bundle, which included education for staff and parents, interventions for optimized breast milk production, and a clinical decision support algorithm for transitioning from tube feeding to direct breastfeeding.

RESULTS

Baseline data was collected prior to the project, which indicated a direct breastfeeding rate of 35% within 24 hours prior to discharge. We used CST Cerner to extract data on feeding route, number of feeds in the 24 hours prior to discharge and the percentage of these which were direct breastfeeding. After intervention, the rate of direct breastfeeding in the 24 hours prior to discharge was 76%.

CONCLUSIONS

Establishing breastfeeding for preterm infants has unique challenges. After identification of key drivers, this project implemented multiple change ideas including a standardized protocol to transition from tube to oral feeding. Through these cycles, we saw increased rates of direct breastfeeding upon discharge. Post-intervention, the rate of direct breastfeeding in the 24 hours preceding discharge has shown positive improvements, up to 76%. Further observation is required to ensure this trend continues and is sustained.

Residents Oral Presentations

Dr. Gurkirat Kaur Kandola / Ped Resident (PGY 4)

Faculty Supervisor: Dr. Ian Pike

Self-Harm Among British Columbian Adolescents and Accessibility to Mental Health Resources

Dr. Gurkirat Kaur Kandola, Fahra Rajabali, Dr. Ian Pike

BACKGROUND

Self-harm is most common in the adolescent age group and traditionally. With self-poisoning rates in adolescents on the rise in BC, less is known about how much other causes of self-harm contribute to the overall burden of self-inflicted injuries in this age group. This study aimed to explore hospitalization trends in BC due to all causes of self-harm (excluding self-poisoning) in adolescents ages 10-19 years old from 2002-2019.

METHODS

The data was extracted from the Discharge Abstract Database, BC Ministry of Health and then stratified according to the ICD-10 codes. This included hospitalization rates and death rates of adolescents due to self-harm (excluding self-poisoning).

RESULTS

There were a total of 1117 hospitalizations due to self-harm, excluding self-poisoning (11.59 per 100,000 population) in BC among 10–19-year-olds. This exploratory analysis will aim to describe trends across BC according to health service delivery area, age group, sex, method of self-harm, and year across the study period.

CONCLUSIONS

These study aims to provide context to the overall issue of self-harm and help inform future decisions around policy and health service delivery as it relates to youth mental health in the province.

Residents Oral Presentations

Dr. Marabeth Kramer / Ped Resident (PGY 4)

Faculty Supervisor: Dr. Eva Moore (Adolescent Medicine) & Dr. Danya Fast (BC Centre on Substance Use)

Defining care for vulnerable youth with high-risk substance use admitted to a tertiary pediatric hospital

Dr. Marabeth Kramer, Dr. Danya Fast, Dr. M. Thulien, Dr. J. Gill, Dr. Eva Moore

This study utilized a retrospective chart review to characterize care for youth admitted to a pediatric hospital for medical complications of substance use (e.g., infections, injury due to accidents, hepatitis etc.). Notably, this chart review characterized stabilization care admissions, which is a novel approach to treating drug overdose among youth. We have reviewed the hospital records of youth admitted to BC Children's Hospital for serious substance use between June 1, 2018 and May 31, 2021 in order to characterize the population of youth being admitted, to define the scope of stabilization care and other treatment approaches currently being offered, and to determine outcomes following admission. It is our eventual aim that data from the chart review be contextualized by qualitative data obtained from in depth interviews with youth and their caregivers. These data will be used to better understand the unique experiences and perspectives of youth undergoing stabilization care and other treatment approaches, and to allow the youths' voices to be heard.

Youth who use substances typically have multiple, complex healthcare needs. For many youth, these medical concerns are compounded by social-structural factors including unstable living conditions, poverty, criminal justice system involvement, and trauma. For Indigenous youth in particular, the legacies of colonization and ongoing systemic racism in BC's healthcare system further complicate their experiences in hospital settings. There is currently no defined standard of care at BC Children's Hospital for the treatment of complications arising from substance use among youth. Moreover, stabilization care is a novel approach, and there is no published data to date examining stabilization care in adult or youth populations. This study will serve as the initial hypothesis-gathering step in the evaluation of the role of BC Children's Hospital in supporting youth who use substances, and to work towards evidence-based hospital care for youth who use drugs.

We aim to provide these data to better inform management guidelines and hospital policies, and more broadly, to identify gaps and inadequacies in the inpatient and outpatient treatment of youth with life-threatening substance use. We aim to define baseline and demographic characteristics of the youth accessing stabilization care, and to provide summary data describing the course in hospital and outcomes of admission. Hopefully this information can be applied to understanding this vulnerable population better, and be used towards defining a standard of care for youth who use drugs on a broader scale.

Residents Oral Presentations

Dr. Sabine Laguë / Ped Resident (PGY 4)

Faculty Supervisor: Dr. Mia Remington

Learning on the wards: Quality improvement of inpatient pediatric learner education on CTU

Dr. Sabine L. Laguë and Dr. Mia Remington

BACKGROUND: Pediatric learners experience most of their inpatient medicine on the wards. While bedside teaching is invaluable, ward learning can be impacted by seasonal exposure, clinical homogeneity, and volume. Locally our learners requested more formal ward teaching to encourage dialogue around common topics perhaps not encountered on rotation. We queried whether having a database of interactive guideline-based educational experiences would minimize barriers (eg. time, resources) to providing formal inpatient learner education.

OBJECTIVES: We sought to enhance general pediatrics ward teaching by developing a curriculum of guideline-based interactive educational content on common inpatient pediatric topics.

METHODS: This study was conducted at BCCH with a range of learners (MSI3, MSI4, pediatric residents (R1-R4)) over 12 months.

- 1) Needs Assessment: We surveyed residents, hospitalist fellows, and CTU physicians regarding a) perceived need for a curriculum, b) content (top 5 CPS guidelines and top 5 non-CPS topics), c) teaching modality, d) need for handouts, and e) curriculum structure.
- 2) Curriculum generation: Curriculum was developed according to needs assessment results.
- 3) Quality improvement: Learners were surveyed after each session with four Likert scale questions (5=strongly agree) regarding teaching quality, clinical translatability, enhanced knowledge/understanding, and improved clinical confidence.

RESULTS:

- 1) Needs assessment: Needs assessment (N=25) unanimously supported a structured curriculum. Eleven CPS statements and twelve non-CPS guideline-based topics were identified for content. Three preferred teaching formats were highlighted, and handouts were important to 88% of respondents. The curriculum was favoured to be 50-75% standardized.
- 2) Curriculum generation: We developed a curriculum of 13 topics with different delivery modalities (e.g. case-based powerpoints, whiteboard talks, Jeopardy, simulation). All were guideline-based, interactive, and had fill-in-the-blank learner handouts. The curriculum was standardized with 4/6 CTU teaching sessions per block being derived from the curriculum bank, and the remainder being at educator discretion (e.g. curriculum bank, interesting case).
- 3) Quality improvement: Likert scales (5=strongly agree) were positive from all learners (MSI3-R4; N=52), with scores of 4.9+/-0.2 for teaching quality, translatability to practice, and improved understanding, and 4.8+/-0.3 for improved clinical confidence.

CONCLUSION:

Here we present an interactive and guideline-based pediatric inpatient learner education curriculum whose development, from content to delivery modality, was directed by community needs. We are now seeking funding to prepare for national distribution (e.g. peer-review, licensure), and intend to publish on platform where the curriculum would be downloadable for use by all educators (i.e. senior residents, staff).

Residents Oral Presentations

Dr. Courtney Leach / Ped Resident (PGY 3)

Faculty Supervisor: Dr. Shazhan Amed

Impact of Public Coverage on Access to Continuous Glucose Monitoring Systems in the Canadian Province of British Columbia

Dr. Courtney Leach, Jeffrey Bone, Dr. Ananta Addala, Dr. Shazhan Amed

BACKGROUND: Type 1 diabetes is one of the most common chronic conditions of childhood, with both short- and long-term consequences associated with suboptimal management. Internationally, a correlation between low socioeconomic status and poor diabetes outcomes has been seen; however, access to diabetes technology has been found to mediate the impact of low SES when available universally. British Columbia's public health insurance, Fair Pharmacare, expanded coverage of assistive diabetes technology to include the Dexcom G6 CGM in June 2021. We sought to assess uptake of CGM technology across various levels of social deprivation both prior to and following this funding change.

METHODS: This was a retrospective cohort study using data gathered from the BC Pediatric Diabetes Registry (BC-PDR), a database that contains both demographic and clinical data for patients of the BC Children's Hospital Diabetes Clinic. We included all patients in the BC-PDR with at least one visit following June 10, 2020, one year prior to Fair Pharmacare Dexcom coverage. Patients without postal codes available in the BCPDR and non-T1D diagnoses were excluded. Degree of social deprivation was defined using the Canadian Index of Multiple Deprivation, which contains neighborhood level quintiles (1 = least deprived, 5 = most deprived) on the following dimensions: residential instability (RI), economic dependency (ED), ethnocultural composition (EC) and situational vulnerability (SV). Ethnocultural Composition was ultimately not used, as due to regional demographics, the quintiles in this domain were felt to be an inaccurate approximation of SES. We used a segmented logistic generalized additive model (GAM) to compare the trends in sensor use pre-pharmacare coverage to those post-pharmacare coverage stratified by CIMD quintiles.

RESULTS: A total of 494 patients were included. The most common quintiles for RI, ED, and SV were 2, 1 and 1, respectively. For each dimension of deprivation, those in the least deprived quintiles had generally higher rates of sensor use both before and after Pharmacare coverage. For both ED and SV, sensor use was declining in the year prior to implementation in the most deprived quintiles but increased sharply after coverage (Figure 1). For Residential Instability, a clear trend did not emerge.

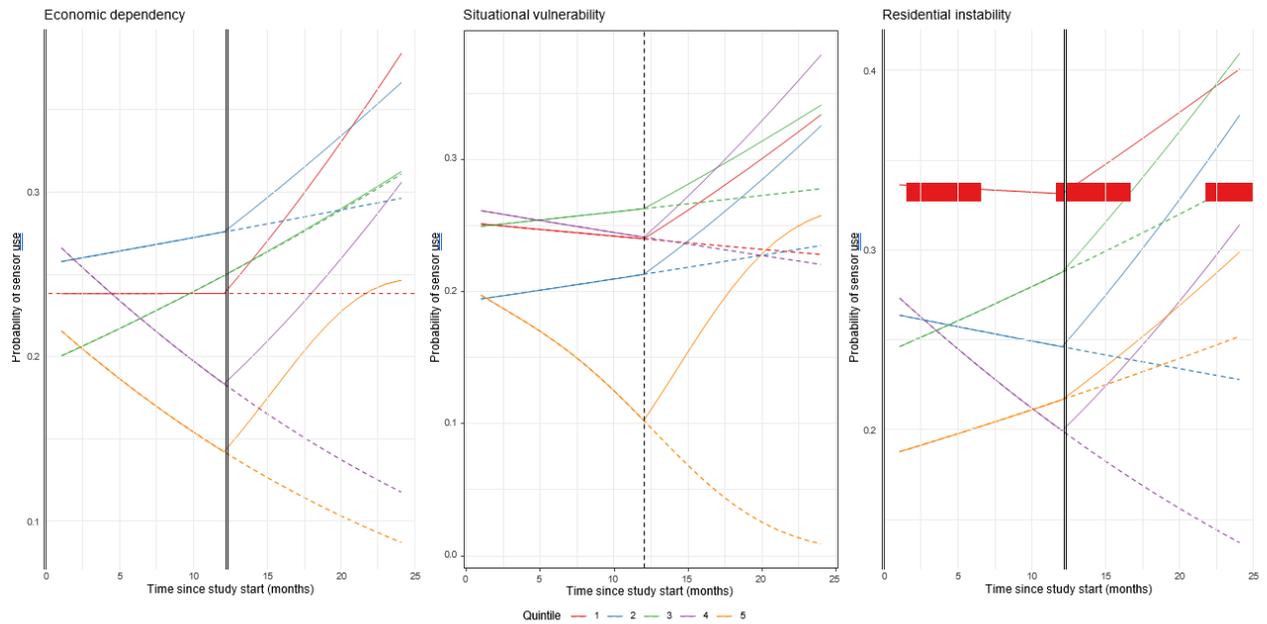
CONCLUSION: Our data demonstrates that public coverage of CGM technology was correlated with increased CGM uptake amongst the most economically vulnerable individuals. This confirms that government policy has had a positive impact on access to diabetes technology and therefore represents a positive step towards equity focused delivery of care.

Residents Oral Presentations

Table 1: Demographics, deprivation quintiles and visit frequency in study population.

	Total (N = 494)
Sex	
Female	213 (43.1)
Male	281 (56.9)
Mean age at diagnosis [SD]	6.7 [3.8, 10.1]
Mean age at study start [SD]	13.4 [9.7, 16.3]
Mean A1C at diagnosis [SD]	11.7 [9.8, 13.8]
Mean A1C at study start [SD]	7.9 [7.1, 8.6]
Median total visits [IQR]	5 [4,6]
Economic instability quinHle	
1	158 (32.0)
2	107 (21.7)
3	98 (19.8)
4	75 (15.2)
5	56 (11.3)
ResidenHal instability quinHle	
1	74 (15.0)
2	132 (26.7)
3	120 (24.3)
4	98 (19.8)
5	70 (14.2)
SituaHonal vulnerability quinHle	
1	173 (35.0)
2	120 (24.3)
3	90 (18.2)
4	78 (15.8)
5	33 (6.68)

Figure 1: Estimated use of sensor pre- and post-Pharmacare coverage by deprivation quintiles. Solid lines represent fitted values from generalized additive model, while dotted lines represent expected values based on pre-Pharmacare coverage trends.



Residents Oral Presentations

Dr. Lindsay Newman / Ped Resident (PGY 4)

Faculty Supervisor: Dr. Melissa Chan

The Incorporation of Entrustable Professional Activities into Simulation Curricula within Canadian Pediatric Residency Programs

Dr. Lindsay Newman, Dr. Melissa Chan

BACKGROUND: In 2021 Canadian pediatrics programs moved to Competence by Design (CBD). The goal was to progress trainees through stages of residency based on attainment of Entrustable Professional Activities (EPAs). Several EPAs may be obtained in simulation; however at this time there is a lack of information on how to incorporate simulation-based EPA assessment into a residency program.

PURPOSE: The aim of this study was to explore how Canadian pediatric programs planned to incorporate EPAs into simulation and to follow-up one year later to explore successes and challenges in this process.

METHODS: In Spring 2022, program directors and simulation leads were surveyed about initial plans for assessing EPAs in simulation. A year later, they were surveyed again about their experience. The surveys were collected using REDCap. Data was interpreted using quantitative and qualitative analysis.

RESULTS: Survey 1 was completed by 8/17 programs. Prior to CBD, the majority (7/8) did not formally assess residents in simulation. Following the CBD launch, 100% planned to assess EPAs in simulation, and most (7/8) planned to develop specific simulation sessions for dedicated EPA assessment. Most planned to have a separate assessor present (5/8) but were undecided if they would provide specific assessor training (5/8).

Survey 2 was completed by 10/17 programs. The majority (9/10) had performed assessment of EPAs in simulation since the launch of CBD, and two-thirds of these developed specific simulation sessions for dedicated EPA assessment (6/9). Comparing Survey 1 and Survey 2, the most common EPAs that programs both planned to assess and actually assessed were procedural-based (Foundations 7 and Core 9) and resuscitation-based (Foundations 1 and Core 2). Five had a separate assessor present and 2/5 provided specific assessor training.

The primary challenge expressed by programs was the added resource burden associated with simulation-based EPA assessment. These resources included: 1. Curriculum: development of new simulation scenarios and addition of more simulation sessions to program schedules, 2. Assessors: the need for more assessors and assessor training, and 3. Assessment tools: navigating the shift to evaluation of individuals in the teamwork-oriented simulation environment and adapting the online format of EPAs.

CONCLUSION: With the addition of EPAs to pediatric residencies, there has been an increased need for simulation for assessment. This has created increased resource needs in time, curriculum, faculty demands, and assessment tools.

Residents Oral Presentations

Dr. Radhika Shankar / Ped Resident (PGY 4)

Faculty Supervisor: Dr. Shazhan Amed

The Evaluation of the LIVE 5-2-1-0 Healthcare Provider Toolkit in the General Pediatrics Clinic at BC Children's Hospital

Dr. Shazhan Amed, Dr. Kimberly Charbonneau, Dr. Molly Sweeney Magee, Dr. Christina Tang, Dr. Radhika Shankar

Healthy living counselling is an important aspect of a healthcare provider's (HCP) role when providing care to pediatric patients. However, HCPs have reported barriers to engaging in these discussions with families, including a lack of self-efficacy, capacity, resources, and time. The LIVE 5-2-1-0 Healthcare Provider Toolkit (HLT) was created and adapted to help address these barriers and empower HCPs to promote healthy behaviors among their patients. The HLT intervention included integration of routine BMI tracking and growth monitoring into clinical practice, HCP training on motivational interviewing, and tools and resources to support assessment and discussion of daily behaviors (e.g. Healthy Habits Questionnaires, goal trackers, information sheets). The purpose of this study was to evaluate the LIVE 5-2-1-0 HLT being used in the General Pediatrics clinic at BC Children's Hospital (BCCH), in terms of, 1) the changes in the use and evaluation of anthropometric measures by HCPs, and 2) the incorporation of healthy living counselling during patient interactions. A retrospective chart review was conducted with patient charts covering visits to the General Pediatrics clinic from May 29, 2019 to March 29, 2020. A total of 340 charts were randomly selected during this time period. Chi square testing was used to compare the frequency of anthropometric measurement in clinic, documentation of healthy living recommendations, referrals made for further community support and appropriate communication to primary care providers, pre versus post HLT intervention. Our study found that the HLT intervention increased the frequency of documentation of anthropometric measurements from 46% (pre-HLT implementation) to 60% (post-HLT implementation) of patient visits. There was also an increase in the frequency of discussions of healthy living (nutrition, physical activity and screentime) between HCPs and patients after the HLT intervention. There was a statistically significant increase in the number of community referrals made to help support patients after the HLT intervention as well. In summary, our results suggest that providing an appropriate framework, relevant resources and adequate training to HCPs regarding motivational interviewing and an outline regarding promotion of healthy behaviors in the clinic setting can improve the discussions surrounding healthy behaviors and also facilitate thoughtful referrals to help support a patient in their healthy living journey.

Residents Oral Presentations

Dr. Asia van Buuren / Ped Resident (PGY 3)

Faculty Supervisor: Dr. Matthew Carwana

Far from home: Qualitative evaluation of the impact of geographic distance from a tertiary pediatric hospital in Canada on family experiences

Dr. Asia L. van Buuren, Dr. Adam Sage, Dr. Adam Sernoskie, Dr. Brittney Udall, Dr. Matthew Carwana

BACKGROUND

Canada's expansive geography has implications for children and their families seeking tertiary paediatric care. There is minimal literature describing their experiences, particularly challenges associated with receiving inpatient care. This qualitative study builds on previous work that captured out-of-pocket costs and stress levels facing families while admitted to our hospital.

OBJECTIVE

- 1) Gather an in-depth understanding of family experiences through exploring gaps in current approaches and supports received
- 2) Generate potential patient-centred solutions to challenges identified

DESIGN/METHODS

Ethics approval was obtained. Family partners were involved in all aspects of study design. Qualitative descriptive methodology was adopted to allow for in-depth exploration of family experiences. Semi-structured interviews explored the above objectives. Participants were families that travelled more than 50 km to receive inpatient care under General Pediatrics at a tertiary hospital in Canada within 1 year of when the interview was conducted. In addition, families were purposively recruited through collaboration with community pediatricians until theoretical saturation was reached. Interviews were transcribed verbatim, de-identified, and analyzed for common themes using descriptive analysis in NVivo software.

RESULTS

Between June and October 2023, 16 caregivers participated in our study. The key themes identified were in the following categories: navigating the unknown, bridging the gaps for far away families through equitable resources, and the role of self-advocacy. Families spoke to the overwhelm they faced when being admitted to our centre. For many, it was their first time in our city and the costs associated with being in this city were significant. They identified key gaps in resources and supports, such as knowledge of medical teams, difficulties with eligibility requirements and reimbursement, and inadequate availability of resources after-hours and on weekends. Self-advocacy was important to all participants and innovative solutions were proposed, such as knowledge exchange facilitated by caregivers with lived experience and caregiver-facilitated trainings for providers.

CONCLUSION

This qualitative study highlights the unique challenges facing families traveling significant distances to receive essential healthcare at a tertiary pediatric hospital in Canada. While significant gaps in resources exist, participants suggested innovative, patient-centred, equitable strategies to bridge these gaps. We plan to partner with patient partners to translate this data into evidence-based interventions to support these families at our institution.

Fellow/ SSR Oral Presentations

Dr. Kayleigh Campbell / PhD Candidate of Department of OBGYN

Faculty Supervisor: Dr. Tim Oberlander

Prenatal antidepressant exposure and neonatal connectome topology: a neural pathway for early social-emotional disturbances

Dr. Kayleigh Campbell, Dr. Colin Brown, Dr. Ghassan Hamarneh, Dr. Steven Miller, Dr. Tim Oberlander

BACKGROUND

Serotonin reuptake inhibitor (SRI) antidepressants are commonly prescribed to treat maternal depressed mood during pregnancy, yet the impact of prenatal SRI exposure on the developing brain remains poorly understood. Using a structural network approach to model early brain connectivity, this study investigated the impact of prenatal SRI exposure on neonatal connectome topology and subsequent associations with early child behaviour at 2-years of age.

METHODS

At postnatal day-7, three groups of term-born neonates underwent diffusion MRI: SRI-exposed ($n = 25$), Depression-exposed (i.e., unmedicated; $n = 23$) and non-exposed Controls ($n = 27$). Structural connectomes were constructed from probabilistic tractography, and graph theory analysis was used to compute network metrics describing key topological features of early brain organization. Network metrics were then compared between groups, adjusting for infant sex, gestational age at birth and postmenstrual age at MRI. At 2-years, toddlers underwent behavioural assessments (Bayley Scales of Infant/Toddler Development-III, Child Behavior Checklist) and partial least squares analysis was used to identify associations between neonatal brain connectivity and early child behavioural outcome.

RESULTS

Compared to both the Depression-exposed and Control groups, SRI-exposed neonatal connectomes had significantly lower global efficiency and higher modularity, predominantly across orbitofrontal, subcortical and superior parietal connections in the left hemisphere, and among SRI-exposed males. Lower connectivity across several newborn brain regions, particularly the bilateral precuneus and left angular gyrus, were then significantly associated with lower cognitive and social-emotional scores, as well as greater externalizing behavioural problems, in SRI-exposed toddlers at 2-years of age (38% covariance; permuted $p=0.002$). There were no significant brain-behaviour associations identified in either non-SRI-exposed group (Depression-exposed, Controls).

CONCLUSIONS

Prenatal SRI exposure uniquely shaped early brain connectivity, beyond the impacts of maternal depressed mood alone. SRI-exposed neonates, particularly males, had more segregated but less globally-integrated connectome topologies, possibly reflecting weaker or immature longer-range connections and therefore lower communication efficiency among regions involved in cognitive and social-emotional processing. These early brain changes may reflect an endophenotype of atypical neurodevelopment associated with prenatal SRI exposure.

Fellow/ SSR Oral Presentations

Dr. Rozalyn Chok / Pediatric Hematology, Oncology, Bone Marrow Transplantation (PGY 6)

Faculty Supervisor: Dr. Amanda Li

Infectious complications associated with treatment of children with relapsed acute lymphoblastic leukemia: a descriptive analysis

Dr. Rozalyn Chok, Dr. Amanda Li

BACKGROUND: Children with relapsed acute lymphoblastic leukemia (ALL) have higher rates of infection and treatment-related mortality than at initial diagnosis. While the role of targeted immunotherapy agents is increasing in this population, combination intensive chemotherapy remains the current standard treatment approach for re-induction. However, the risk of serious infections is high and may affect ability to proceed with consolidative treatment. We performed an in-depth review of infectious complications during re-induction for relapsed ALL in patients at our centre to better understand how to monitor for, prevent, and treat infections in this population.

OBJECTIVE: To describe the incidence and pattern of infections during re-induction in children with relapsed ALL at a single tertiary centre.

DESIGN/METHODS: A retrospective chart review and descriptive analysis was performed of patients from British Columbia Children's Hospital with relapsed ALL between 2006 to 2022 receiving combination chemotherapy for initial re-induction treatment.

RESULTS: Forty-three patients (58% male) were included with median age at relapse of 10.2 years. The most common diagnosis was B-cell ALL (n=36; 84%). Most patients had isolated or combined medullary relapse (n=36; 84%). 90% of patients (n=39) received four-drug re-induction with steroids, an anthracycline, vincristine, and asparaginase. Median duration of severe neutropenia was 21 days. Twenty-two patients (51%) had hyperglycemia during re-induction. There were 42 microbiologically or clinically confirmed infectious episodes in 22 patients (51%). Fourteen episodes (33%) were diagnosed in an outpatient and resulted in readmission to hospital (median duration 15 days). Two patients (4.8%) required admission to the pediatric intensive care unit (PICU) for inotropic support. Frequent sites of infection were head and neck (36%), bloodstream (29%), intraabdominal (29%), and skin/soft tissue (21%). Bacterial infections (62%) predominated over viral (21%) and fungal (17%). No patients received antibiotic prophylaxis other than for *Pneumocystis jirovecii*. Antifungal prophylaxis was used in 30% of patients. Linear regression showed a trend toward increased infection in patients with hyperglycemia and prolonged neutropenia.

At median follow up of 36 months, 29 patients (67%) were alive and disease-free. All deceased patients had active disease at the time of death. There were no deaths due to infection.

CONCLUSION: Our results show high rates of infection in newly relapsed ALL patients undergoing combination chemotherapy re-induction. Given high rate of readmission in our cohort, inpatient admission for these patients may be warranted, particularly during periods of severe or prolonged neutropenia. Further studies may clarify if management of hyperglycemia helps to reduce infection risk.

Fellow/ SSR Oral Presentations

Dr. Jad El Maamari / Pediatric Hematology, Oncology, Bone Marrow Transplantation

Faculty Supervisor: Dr. Paul Monagle

Reference Values for coagulation analytes across 3 different analyzers in neonates and children 30 days to 18 years of age

Dr. Jad El Maamari, Dr. Vasiliki Karlaftis, Dr. Chantal Attard, Dr. Sharon Yong, Dr. Stephen Hearps, Dr. Paul Monagle on behalf of The HAPPI Kids Study Team

BACKGROUND

Accurate pediatric reference intervals (RIs) in coagulation testing are imperative for delivering optimal clinical care. Currently, limited data are available for comparing continuous age-matched references across various analyzers. This study offers a comprehensive comparison of reference values and age specific RIs for coagulation analytes in children, utilizing three different analyzer types.

METHODS

Blood samples were collected from healthy newborns and children aged 30 days to less than 18 years. Serum aliquots from the same individual were analyzed using three different analyzer types. Differences in mean reference values among the analyzers were examined through mixed-effect regression analysis. The maximum variation between analyzers was compared with analyte-specific allowable total error from the Westgard QC database. Quantile regression, utilizing power variables in age selected by fractional polynomial regression for the mean, was employed to estimate age specific RIs, with adjustments for sex when necessary.

RESULTS

Variations in age-specific mean reference values among different analyzer types typically remained within the acceptable total error limits, as defined by Westgard QC, for most analytes. Age-specific reference limits applicable across various analyzers were established based on age and/or sex. Furthermore, analyzer-specific reference limits for all analytes across the three types were also detailed in relation to age and/or sex.

Direct head to head comparison of aliquots across analysers for the first time enables us to look at differences between analysers at a population and individual level. The different analysers showed clinically significant variation. Age is a critical variable in determining the reference intervals applicable to individual patient samples.

CONCLUSIONS

This study systematically quantifies and qualitatively assesses the concordance of results for individual children across diverse analyzer types, emphasizing the importance of accurate analyser specific age-related reference intervals. The presented equations facilitate the seamless integration of age-specific reference intervals into laboratory information systems, thereby enhancing the precision of evidence-based clinical decision-making in pediatric care.

Fellow/ SSR Oral Presentations

Dr. Elad Machtey / Pediatric Emergency Medicine Fellow

Faculty Supervisor: Dr. Melissa Skaugset

Pediatric Point-of-Care Ultrasound Training Module for Acute Neck Lymphadenopathy

Dr. Elad Machtey, Dr. Melissa Skaugset

BACKGROUND

Point-of-Care Ultrasound (POCUS) has become indispensable in pediatric care, aiding in diagnoses, guiding procedures, reducing emergency department stays and more. Its radiation-free nature and cost-effectiveness make it a valuable tool. The rise of online learning, accelerated by the pandemic, offers flexibility and cost-effectiveness, making it an ideal platform for POCUS education.

OBJECTIVES

Teaming up with KidSONO, our aim was to create an online module integrating theory and image quizzes, and a video tutorial for assessing children with acute neck lymphadenopathy. KidSONO, designed for pediatric POCUS e-teaching, adjusts content based on learner performance, providing a personalized learning experience with Royal College credits.

METHODS/TECHNIQUE

We collected POCUS scans from our Emergency Department, spanning 37 examinations and generating 355 video clips and 63 images. Literature reviews informed our main module, covering clinical approaches, indications, techniques, and normal lymph node anatomy. We addressed reactive nodes, suppurative nodes, abscesses, and lymphomatous.

RESULTS

Through literature review and internal scans, we developed a comprehensive module emphasizing POCUS reliability in neck swelling assessment, an image quiz featured 15 questions with clinical vignettes and troubleshooting scenarios. theory quiz covered key aspects of POCUS for neck swelling in children.

NEXT STEPS

Feedback from KidSONO has guided us to develop a tutorial video supplementing the main module. This 10–15-minute video will reiterate POCUS evidence, indications, techniques, and troubleshooting scenarios.

CONCLUSION

In a short timeframe, we created a Pediatric POCUS training module, hoping to enhance clinical assessments and healthcare for pediatric patients. The multilayered approach, encompassing theory, quizzes, and video content, reflects our commitment to comprehensive and accessible education for healthcare providers.

Fellow/ SSR Oral Presentations

Dr. Lilian Ping Ling Ngo / Pediatric Neonatology Fellow

Faculty Supervisor: Dr. Pascal Lavoie

The impact of RSV infection post-resurgence on disease severity and the role of co-infection in infants less than 6 months old in British Columbia, Canada

Dr. Lilian Ngo, Dr. Marina Viñeta Paramo, Dr. Bahaa Abu-Raya, Dr. Frederic Reicherz, Dr. Rui Yang Xu, Jeffrey N. Bone, Dr. Jocelyn A. Srigley, Dr. Alfonso Solimano, Dr. David M. Goldfarb, Dr. Pascal M. Lavoie

BACKGROUND

The epidemiology of RSV has changed during the COVID-19 pandemic. The resurgence of RSV infections post-Covid-19 mitigation measures relaxation has become a significant public health concern. While seasonal respiratory viruses (e.g. RSV, flu, rhinoviruses) each have their own seasonal periodicity, driven by viral and population factors, this year (2022-23) saw a lot more synchronous epidemics across viruses, potentially in the context of lower population immunity rates against these infections, compared to any previous years. This study aimed to study the severity of RSV infections in children < 6 months old and explore the potential role of viral co-infections in increasing the severity of RSV infection in this age group.

METHODS

Retrospective cohort study of all children < 6 months old who tested RSV positive at BC Children's Hospital (BCCH) between September 1, 2017 to January 7, 2023. The main severity outcomes were hospitalizations and intensive care unit (ICU) admissions.

RESULTS

Only 1 RSV case was detected at BCCH, and 11 cases in all of BC between Sep 2020 and Aug 2021. Following this hiatus, RSV cases resurged massively in the (Sept-Aug) 2021-22 period, with 241 RSV cases reported (testing positivity rate: 19.1%), but no more hospitalizations (n=64; 26.6% of RSV cases) and ICU admissions (n=16; 25.0% of RSV hospitalizations) than the average of three pre-pandemic periods (average 61 hospitalizations, 49.6% of RSV cases, and 14 ICU admissions, 32.3%, per season, in 2017-2020). The following year (Sept 1, 2022-Jan 7, 2023) saw more RSV cases (n=172; testing positivity rate: 29.6%), with significantly more hospitalizations (n=90; 52.3%; 95%CI: 44.8% to 59.8%) and ICU admissions (n=29; 32.2%; 95%CI: 25.2 % to 39.2 %), in healthy children, with a younger median age at diagnosis (1.8 months; IQR: 1.1 to 3.0 months), compared to 2021-22 (2.6 months; IQR: 1.4 to 4.0 months) p<0.001. There was also an increase in the proportion of children with viral co-infections among those admitted to ICU in 2022-23 compared to 2021-22 (9/29; 31.0% vs. 2/16; 12.5%; OR: 4.27, 95%CI: 0.95-30.64). There was no difference in length of hospital stay between the 2021-22 and 2022-23 periods (median 3 days, IQR 2-5 versus 3 days, IQR 2-6 days). Hospitalizations in palivizumab-eligible infants, including children born prematurely <35 weeks GA and those with cardiac or respiratory co-morbidities remained low in both periods (n=4 in 2021-22, and n=4 in 2022-23).

CONCLUSION

RSV practically disappeared in BC from September 1, 2020 to August 31, 2021, and this was followed by a progressive worsening of RSV clinical severity in healthy young infants over the following two seasons. Hospitalizations and ICU admissions remained infrequent in palivizumab-eligible infants. In 2022-23, viral co-infection may have contributed to increasing ICU admissions, although completion of data for the remaining portion of the season is required to conclude more decisively.

Resident/ Fellow/ SSR Posters

Dr. Harrison Anzinger / Ped Resident (PGY3)

Faculty Supervisor: Dr. Brett Schrewe

Evaluation Without Representation: Pediatric Resident Perspectives on CBME

Dr. H. Anzinger, Dr. B. Schrewe

Read poster online:

[2024 CRD Poster Competition combined posters from Residents and Fellows.pdf \(ubc.ca\)](https://www.ubc.ca/2024-CRD-Poster-Competition-combined-posters-from-Residents-and-Fellows.pdf)

Evaluation Without Representation: Pediatric Resident Perspectives on Competency-Based Medical Education

Harry Anzinger MD and Brett Schrewe MDCM, MA, PhD, FRCPC

University of British Columbia, Department of Pediatrics

Background

- Pediatric residency programs transitioned in 2021 to a new Royal College assessment model called Competence by Design (CBD).
- CBD represents a fundamental shift in postgraduate medical education, from a time-based system to one based on demonstrating professional competencies through regular observations of the abilities expected of specialists.
- Competencies are integrated into Entrustable Professional Activities (EPAs), which residents must complete to advance through residency.
- Although CBD is intended to be learner-centered, resident voices have been under-represented in its design and delivery.

Study Objectives

In this study, we

1. Explored how pediatric residents perceive CBD as impacting their education and evaluation
2. Identified ideas that pediatric residents have for programs and faculties to improve CBD implementation

Methods

Document analysis of general and program-specific CBD resources

↓

Interviews with program directors and CBD leads at Universities of Alberta (UofA), Toronto, and British Columbia (UBC) (n=6)

↓

Program implementation values and priorities identified, which informed the creation of resident interview framework.

↓

Interviews with pediatric residents at UofA and UBC (n=14)

↓

Reflexive, Inductive Thematic Analysis

Acknowledgments

Thank you to all our participants!
This work is supported by the Faculty/Resident Development Initiatives Grant (FRDIG) Office of Faculty Development, UBC Faculty of Medicine

Questions?

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Results

Pediatric residents agree with CBD's theory and espoused purpose, yet feel that its potential benefits are significantly hampered in four key ways:

Inordinate Responsibility & Administrative Burden on Residents

Staff Physicians Reluctant to Embrace CBD

CBD Is Less Assessment For Learning, More Completion of EPA Checklist

EPAs Generate Poor Quality Feedback

Scan the QR code to View Quotes from Resident Interviews

Resident One Word Descriptions of CBD

Curriculum

Unhelpful

Unsuccessful

Learning-at-a-Cost

EPA

Logical-but-Redundant

Assessment

Individualized-Learning

Work-in-Progress.

Time-Consuming

Exhausting

Framework

Promising

Resident Suggestions for Improvement

- ✓ Decrease total number of EPAs to focus on quality over quantity
- ✓ Revise EPAs with perspectives from senior residents and recent graduates to better represent current pediatric practice and resident learning goals
- ✓ Improve dialogue between residents, preceptors, competency committees, & Royal College to build buy-in/facilitate process improvement
- ✓ Build preceptor engagement with recognition and positive reinforcement
- ✓ Institute formal coaching resources for residents and staff
- ✓ Support customization by competency committee for local context
- ✓ Re-design the O-Score System to better represent stages of training

Resident/ Fellow/ SSR Posters

Dr. Amanbir Atwal / Ped Resident (PGY 3)

Faculty Supervisor: Dr. Erin Peebles

Implementation of Self-determination Theory in Pediatrics Clerkship Academic Half Days

Dr. Amanbir Atwal, Dr. Erin Peebles

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Implementation of Self-determination Theory in Pediatric Clerkship Academic Half Days

Amanbir Atwal, MD¹; Erin Peebles, MD FRCPC MHPE^{1,2}
¹University of British Columbia, Vancouver, BC.
²Center for Health Education Scholarship, University of British Columbia, Vancouver, BC.

Introduction

- At our institution, academic half day (AHD) in pediatric clerkship consisted of mandatory didactic lectures with minimal engagement.
- We created a new AHD curriculum based on self-determination theory (SDT).^{1,2}
- SDT emphasizes **autonomy, relatedness and competence** as fundamental needs for intrinsic motivation and success in learning environments.^{1,2}

Methods

Study "roadmap" with suggested resources



Weekly case-based discussions



Survey students using Basic Psychological Need Satisfaction at Work Scale (W-BNS)^{3,4}



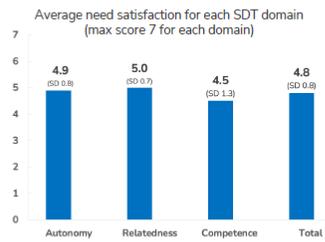
Objectives

- Can the tenets of SDT (autonomy, relatedness and competence) be incorporated into AHDs to increase learner motivation?
- How does an AHD curriculum based on SDT impact performance on exams?

Results

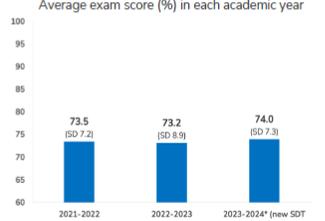
- 18% response rate (n=33)
- Students self-reported **modest autonomy and relatedness satisfaction, lower subjective competency satisfaction.**
- Objectively, no statistically significant difference in average exam scores.

Average need satisfaction for each SDT domain (max score 7 for each domain)



Domain	Average Score	SD
Autonomy	4.9	0.8
Relatedness	5.0	0.7
Competence	4.5	1.3
Total	4.8	0.8

Average exam score (%) in each academic year



Year	Average Exam Score (%)	SD
2021-2022	73.5	7.2
2022-2023	73.2	8.9
2023-2024* (new SDT curriculum)	74.0	7.3

*6 months of exam scores and data for 2023-2024 academic year thus far

Medical students can be motivated through self-directed and collaborative AHD curricula.

- However, students may struggle with *subjective* feelings of competence when introduced to self-determination theory early in clinical training.
- This suggests a need for *gradual* increase in autonomy as learners progress in training and develop intrinsic motivation for life-long learning.

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Resident/ Fellow/ SSR Posters

Dr. Brittany Curry / Ped Resident (PGY 2)

Faculty Supervisor: Dr. Erin Peebles

Residency Letters in the AI Era: Comparing AI and Human-Generated Personal Statements for Pediatric Residency Admissions

Dr. Brittany Curry, Dr. Mia Remington, Dr. Amrit Kirpalani, Dr. Erin Peebles

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Residency Letters in the AI Era: Comparing AI and Human-Generated Personal Statements for Pediatric Residency Admissions

Brittany Curry MD¹, Mia Remington MD FRCPC¹, Amrit Kirpalani MD FRCPC MMed², Erin Peebles MD FRCPC MHPE^{1,3}

¹ Department of Pediatrics, University of British Columbia, Vancouver, BC ² Department of Pediatrics, Western University, London, ON ³ Center for Health Education Scholarship, University of British Columbia, Vancouver, BC




INTRODUCTION

- Personal statements have a substantial role within the application process for the Canadian Resident Matching Service¹
- Despite the widespread requirement for personal letters, limited research exists on their efficacy in ranking applicants, with wide inter-rater variability^{2,3}
- There have been previous studies noting the prevalence of plagiarism in personal letter writing, which has been up to 5.6% in some literature⁴
- In the new generation of artificial intelligence (AI), there is a lack of understanding of how large language models may affect the effectiveness of personal letters in candidate selection



An understanding of the efficacy of AI-generated personal letters compared to human-generated letters in pediatric residency program applications is important to determine the continued relevance of personal letters in an era where AI is readily accessible.

HYPOTHESIS

We hypothesize that AI-generated personal letters will have equivalent scores to human-generated personal letters in pediatric residency program admissions.



METHODS

We will use traits from 30 original CARMS letters to create AI-generated letters using ChatGPT[®]

↓

Program selection members will be randomly assigned to evaluate half of the letters (30), consisting of a mix of AI and human-generated letters.

↓

Letters will be scored using a standardized rubric out of 10 and whether they appear to be AI or human-written.

↓

Paired t-tests will be used to determine whether the letter types yield similar or disparate scores.

OUTCOMES

Primary outcome: Scores of AI-generated personal letters compared to human-generated personal letters.

Secondary outcome: Accuracy of markers determining whether the letter is AI or human-generated

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Resident/ Fellow/ SSR Posters

Dr. Sean Duke / Ped Resident (PGY 3)

Faculty Supervisor: Dr. Catherine Biggs

Functional and phenotypic characterization of novel loss-of-function variants in CTLA4

Dr. Sean Duke, Dr. James Maiarana, Dr. Pariya Yousefi, Dr. Samantha Gerrie, Dr. Cornelius Boerkoel, Dr. Ali Amid, Dr. Dewi Schrader, Dr. Orlee Guttman, Dr. Sally Lawrence, Dr. Meera Rayar, Dr. Connie Yang, Dr. Anna F. Lee, Dr. Amin Kanani, Dr. Persia Pourshahnazari, Dr. Audi Setiadi, Dr. Jacob Rozmus, Dr. Stephanie Erdle, Dr. Kyla J Hildebrand, Dr. Elliot James, Dr. Stuart E Turvey, Dr. Janet Markle & Dr. Catherine M Biggs.

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Functional and phenotypic characterization of novel loss-of-function variants in CTLA4

Sean Duke¹, James Maiarana², Pariya Yousefi¹, Elijah Burks², Samantha Gerrie¹, Cornelius Boerkoel¹, Ali Amid¹, Dewi Schrader¹, Orlee Guttman¹, Sally Lawrence¹, Meera Rayar¹, Connie Yang¹, Anna F. Lee¹, Amin Kanani¹, Persia Pourshahnazari¹, Audi Setiadi¹, Jacob Rozmus¹, Stephanie Erdle¹, Kyla J Hildebrand¹, Elliot James¹, Stuart E Turvey¹, Janet Markle², Catherine M Biggs^{1,3}

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³ St Paul's Hospital, The University of British Columbia, Vancouver, British Columbia, Canada.



Background

- Cytotoxic T lymphocyte antigen-4 (CTLA-4), a T-cell inhibitory receptor, regulates immune responses by preventing overstimulation of T-cells through competitive binding of CD80/CD86 on antigen presenting cells¹
- Heterozygous loss-of-function variants in CTLA4 result in the immune dysregulation disorder termed CTLA-4 Insufficiency²
- Diagnosing CTLA-4 Insufficiency facilitates use of life-saving targeted therapies; however, can be hampered by inconclusive genetic testing results
- Here we report the clinical presentations and functional validation of novel CTLA4 variants identified at our center

Methods

- Patients with variants of uncertain significance (VUS) in CTLA4 were enrolled in the study
- Variant significance was analyzed by computational analytical tools and by assessing CTLA-4-mediated transendocytosis of its ligand CD80, using plasmids expressing the variants
- Clinical and immunological features were assessed before and after treatment

Results

Case Presentations

	Case 1	Case 2
Presenting history	2-month-old boy with a paternal VUS in CTLA4 and paternal phenotype consistent with CTLA-4 insufficiency (recurrent infections, diarrhea, vitiligo, hypogammaglobulinemia, eczema, nodular lymphoid hyperplasia of the liver, and T2DM)	13-year-old male referred for history of recurrent GI infections, refractory celiac disease, asymptomatic progressive pulmonary nodules, autoimmune cytopenias, and hypogammaglobulinemia, who around the time of genetic diagnosis developed transient expressive aphasia and apraxia on a one-week background of persistent headache
Investigations	Neutropenia (0.8x10 ⁹ /L), normal IgG & IgM, ↓ IgA level, normal T16/76 cell subsets & T16 cell memory panels Normal chest xray and abdominal ultrasound	Neutropenia (0.3x10 ⁹ /L), ↓ IgG & IgM, normal IgA, ↓ naive T cells, T16+ CD45hi, T16+ CD57+ and T16+ CD8+ cells and T16+ CD31low B-cells Brain MRI: several hypertensive lesions (Fig 4)
Genetics	Heterozygous variant in CTLA4 c.418A>C, p.(Y139F)	Heterozygous variant in CTLA4 c.424G>C, p.(Y142R)

Variant analysis and functional validation

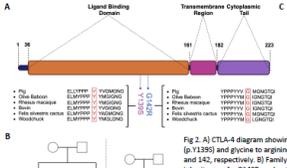


Fig 2. A) CTLA4 diagram showing the location of the tyrosine to serine (p.Y139F) and glycine to arginine (p.Y142R) substitutions at positions 139 and 142, respectively. **B)** Family pedigree demonstrating de novo inheritance of p.G142R, and autosomal dominant inheritance of p.Y139F from an affected father to whom the variant occurred de novo. **C)** Transendocytosis of CD80^{hi} by CHO cells expressing wild type or variant (Y139F, G142R) pCMV-CTLA4-Myc-DDK plasmids. CD80^{hi} gain shown as percent of wild type, n=3 independent experiments. *p<0.05, **p<0.0001, paired t-test. UT=untransfected control

Molecular diagnosis yields personalized therapy

Case 1:

- Diagnosis led to recognition of autoimmune neutropenia, which resolved by age 11 months
- Now undergoing routine monitoring for complications related to CTLA-4 Insufficiency

Case 2:

- Upon diagnosis, workup revealed inflammatory brain disease related to CTLA-4 Insufficiency; pulmonary nodules identified as granulomatous lymphocytic interstitial lung disease
- Adalimumab discontinued → transitioned to targeted therapy with the CTLA-4 fusion protein abatacept, which in combination with corticosteroids and sirolimus dramatically improved his multisystem (gastrointestinal, brain, lung, and hematologic) autoimmunity

Soluble IL-2 receptor level declines with treatment for CTLA-4 Insufficiency in Case 2

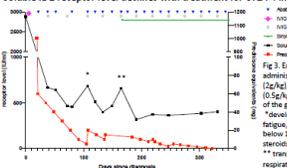


Fig 3. Each data point represents a dosing administration, with anti-inflammatory IVIG (2g/kg), abatacept, immunoglobulin IVIG (0.5g/kg), and sirolimus dosing shown at the top of the graph. *developed recurrence of loss of appetite, severe fatigue, and neutropenia upon tapering steroids below 10mg/day; symptoms resolved once steroids increased to 20mg/day. **transient increase in IL2R attributed to upper respiratory infection treated with oral antibiotic

Brain and immune abnormalities respond to targeted therapy for CTLA-4 insufficiency

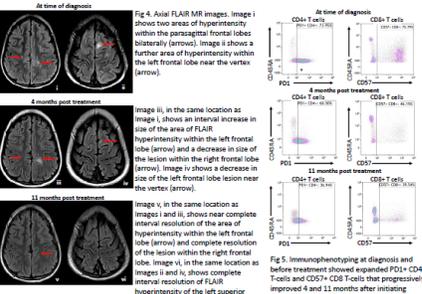


Fig 4. Axial FLAIR MR images. Image I shows two areas of hyperintensity within the parietal/ frontal lobes bilaterally (arrows). Image II shows a further area of hyperintensity within the left frontal lobe near the vertex (arrow).

Fig 5. Immunophenotyping at diagnosis and before treatment showed expanded CD4⁺ CD4⁺ T cells and CD57⁺ CD8⁺ T cells that progressively improved 4 and 11 months after intrathecal directed therapies for CTLA-4 insufficiency.

Conclusions

- We present two previously unreported pathogenic variants in CTLA4 [supported by clinical phenotypes, in silico modeling, and functional validation] and expand the genotypic profile of CTLA-4 Insufficiency
- These two contrasting presentations and outcomes highlight (1) the vast phenotypic profile of CTLA-4 Insufficiency, and (2) the importance of considering IEs when evaluating patients with immune dysregulation, and (3) the role of genetic testing when inborn errors of immunity are suspected
- Further studies on the natural history and treatment of CTLA-4 Insufficiency are needed to establish clinical care guidelines for these vulnerable patients

Acknowledgements

- We would like to thank the families of the presented cases for their participation in this work. This work was supported by a Michael Smith Health Research BC Health professional investigator award.

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Dr. Sabine Laguë / Ped Resident (PGY 4)

Faculty Supervisor: Dr. Shreya Moodley

The Pediatric Aortopathy Connection: Creating a provincial patient and family networking and educational conference for inherited aortopathies

Dr. Sabine L. Laguë, Dr. Leslie Raffin, Dr. Pascal Bernatchez, Dr. Alison Castle, Dr. Winnie Chung, Dr. Astrid de Souza, Dr. Karen LeComte, Dr. Karen Lyons, Dr. Gnalini Sathananthan, Dr. Heather Stephenson, and Dr. Shreya Moodley

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The Pediatric Aortopathy Connection (PAC): Creating a provincial patient and family networking and educational conference for inherited aortopathies

Sabine L. Laguë¹, Leslie Raffin², Pascal Bernatchez³, Alison Castle⁴, Winnie Chung⁵, Astrid de Souza⁶, Karen LeComte⁶, Karen Lyons⁷, Gnalini Sathananthan⁸, Heather Stephenson⁹, and Shreya Moodley⁹

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BACKGROUND

Inherited Aortopathies
Autosomal dominant – AD Syndromic Non-syndromic

Marfan syndrome (AD; most common syndromic presentation; 1 in 3-5000)¹
Vascular Ehlers Danlos IV (AD)
Loeys-Dietz syndrome (AD)
Familial thoracic aortic aneurysm and dissection (FTAAD) (AD)

These conditions may increase risk for #1-3²

1. Aortic aneurysm 2. Aortic root dilation 3. Aortic root dissection

Present in 50% of children with Marfan syndrome 50% of dissections <40 years are attributable to Marfan syndrome³

Syndromic forms may need multi-disciplinary care

- Psychosocial**: Chronic disease management, Mental health, Emergency planning
- Cardiology**: Surveillance, Blood pressure control, Surgical planning
- Orthopedics**: Scoliosis
- Obstetrics**: Family planning, Specialized pregnancy care
- Genetics**: Diagnosis, Family planning
- Ophthalmology**: Retinal detachment
- Respirology**: Recurrent pneumothorax
- Gastrointestinal**: Spontaneous hollow organ rupture
- Musculoskeletal**: Safe sport, Joint laxity, Chronic pain, Physiotherapy, Occupational therapy

METHODS

Organizational committee: Patients and families, physicians (adult and pediatric cardiology, genetics, radiology), allied health (nursing, psychology), and researchers held meetings to identify goals and objectives, educational topics, fundraising, and event logistics.

Needs assessment: Participants completed pre-conference questionnaires with demographic and qualitative questions and 9 Likert scale questions: (#strongly agree)

- Whether they know other families with a similar diagnosis.
- Whether they feel connected to the broader community of people with a similar diagnosis.
- Whether they feel isolated from people with a similar diagnosis.
- Whether they have a good understanding of the diagnosis.
- Whether they feel that they understand routine surveillance recommended for the diagnosis.
- Whether they have a good understanding of recommendations surrounding safe sport.
- Whether they have a good understanding of healthy living recommendations for the diagnosis.
- Whether they have a good understanding of supporting mental wellness with this diagnosis.
- Whether they feel empowered regarding their diagnosis.

Quality improvement: Attendees completed post-conference questionnaires of the same above Likert questions, in addition to qualitative questions for event improvement.

RESULTS

WHO: N=81 people from 30 families
 • Marfan syndrome (N=40)
 • Loeys-Dietz syndrome (N=34)
 • Other (e.g. FTAAD) (N=16)

WHERE:
 Provincial location: lower mainland, island, northern, interior
 Percentage: 79% 7% 10% 10%

Size of center:
 rural (<5,000), town (5-50,000), city (>50,000), metropolitan (>1,000,000)
 Percentage: 7% 7% 50% 36%

Pediatric Aortopathy Connection (PAC)
 September 23, 2024: inaugural single day event of family networking and education with 44 adults and children.

Curious about PAC?
 Watch our highlights video! View 4 min of footage from the day and hear inspiring family and health-care provider testimonials.

Sessions at PAC:
 • Educational: Basics of genetics, pediatric and adult cardiology, 3D aortic models, radiology, ophthalmology, safe sport and active living
 • Mental health and wellness: Mental health and wellness strategies for children, teens, adults; discussing strategies on how to talk about heritable conditions as a family
 • Networking for children and adults: Icebreakers, arts and crafts, coffee breaks, lunch, info booths, and meeting patient advocacy groups
 • Q&A Panels: Patient and family testimony panel; Healthcare panel (physicians, nurses, researchers, exercise physiologist, psychologist)

RESULTS

Quality improvement
 See Methods section to read all 9 full Likert scale questions.
LEGEND: ■ Strongly disagree (1) ■ Disagree (2) ■ Neutral (3) ■ Agree (4) ■ Strongly agree (5)

Before Attending PAC

Question	Average +/- SEM
1. Know others with the diagnosis:	2.03 +/- 0.29
2. Feel connected to others with the diagnosis:	3.93 +/- 0.22
3. Feel isolated regarding the diagnosis:	2.13 +/- 0.24
4. Understand the diagnosis:	2.90 +/- 0.24
5. Understand routine surveillance:	3.56 +/- 0.19
6. Understand safe sport recommendations:	3.77 +/- 0.18
7. Understand health living suggestions:	3.50 +/- 0.18
8. Understand how to support mental health:	3.57 +/- 0.17
9. Feel empowered regarding the diagnosis:	3.57 +/- 0.16

After Attending PAC

Question	Average +/- SEM
1. Know others with the diagnosis:	4.38 +/- 0.38
2. Feel connected to others with the diagnosis:	4.38 +/- 0.26
3. Feel isolated regarding the diagnosis:	2.25 +/- 0.45
4. Understand the diagnosis:	4.50 +/- 0.18
5. Understand routine surveillance:	4.38 +/- 0.18
6. Understand safe sport recommendations:	4.13 +/- 0.23
7. Understand health living suggestions:	4.38 +/- 0.18
8. Understand how to support mental health:	4.25 +/- 0.25
9. Feel empowered regarding the diagnosis:	4.63 +/- 0.18

SEM: Standard error of the mean
 Statistics: Statistical analyses comparing responses are not shown due to literature generally advising against their use for comparing Likert results in the setting of incompletely paired groups.

CONCLUSIONS

Enhanced knowledge, sense of connection, and empowerment for attendees of the inaugural Pediatric Aortopathy Connection (PAC).

Future directions: We hope to hold this event biennially, expanding inter-provincially and virtually to increase accessibility.

OBJECTIVES

- Assess need for and interest in a patient and family networking and educational event for those living in the province of British Columbia, Canada who are impacted by inherited aortopathies.
- Create and deliver a province-wide patient and family networking and educational event for families impacted by inherited aortopathies.

ACKNOWLEDGEMENTS + FUNDING

We thank our patients and families who willingly shared their life experiences and engaged in this opportunity.

We thank our patient and parent volunteers for shaping the event and our organizing committee for their tireless effort and enthusiasm.

We thank our sponsors for helping to make this dream and opportunity a reality for BC families.

REFERENCES

- Namiriz F. et al. In: The Metabolic and Molecular Basis of Inherited Disease, McGraw Hill, New York (1995), p.4079.
- Canadian Cardiovascular Society Position statement on the Management of Thoracic Aortic Disease (2014) CJC, 95:977-989.
- Malina Per et al., International Registry of Acute Aortic Dissection (IRAD) Investigators (2002) J Am Coll Cardiol, 40(4):685.

Resident/ Fellow/ SSR Posters

Dr. Nancy Lum / Ped Resident (PGY 3)

Faculty Supervisor: Dr. Sara Jassemi

Enhancing Social Determinants of Health Education for Pediatric Residents

Dr. Nancy Lum, Dr. Sara Jassemi

Read poster online:

[2024 CRD Poster Competition combined posters from Residents and Fellows.pdf \(ubc.ca\)](https://www.ubc.ca/2024-CRD-Poster-Competition-combined-posters-from-Residents-and-Fellows.pdf)

University of British Columbia

Enhancing Social Determinants of Health Education for Pediatric Residents

Nancy Lum, MD; Sara Jassemi, MD, FRCPC

Introduction

Social Determinants of Health (SDOH) account for 30-55% of health outcomes;¹ however, existing medical curricula may not sufficiently equip trainees to address patients' psychosocial needs.

This ongoing quality improvement project aims to increase resident proficiency in assessing and addressing SDOH within UBC's Pediatric Residency Program.

We present our environmental scan of the program's curricular climate surrounding SDOH education. Additionally, we present our driver diagram that informed the interventions for our Plan-Do-Study-Act (PDSA) cycles.

Methods

Environmental scan

- Interviews
- Focus group
- Resident survey
- Chart review in Resident Continuity Clinic

↓

Create driver diagram and generate change ideas

↓

Conduct Plan-Do-Study-Act cycles

Numerous barriers prevent pediatric residents from receiving adequate education on social determinants of health.

Pediatric residents express a desire for more intentional and explicit teaching about the psychosocial aspects of patient care.

Results

According to our resident survey (n=14),

- Only 29% felt proficient at assessing SDOH
- Only 36% felt proficient at addressing SDOH

Table 1: Chart review of social histories documented in randomly-selected consultation notes, authored by pediatric residents in BC Children's Hospital's Resident Continuity Clinic (n=20).

Documented Components of Social History	Proportion of Consultations
Any social history taken	100%
Parental work status	85%
Parental occupations	60%
Living situation (ie, who does the patient live with?)	85%
Country of birth	25%
Extended health benefit access	25%
Financial strain	5%
Screen for food insecurity	0%
Screen for housing instability	0%
Screen for transportation needs	0%

Discussion

We selected 3 change ideas for the Social Pediatrics rotation in our PDSA cycles:

- An orientation presentation, which teaches the IT-HELLPS approach to social history-taking.²
- A case workbook on common psychosocial issues in General Pediatrics.
- Structured observations of psychosocial histories taken by healthcare providers experienced in Social Pediatrics.

We plan to study how these interventions affect resident proficiency at assessing and addressing SDOH through our PDSA cycles.

References

1. World Health Organization. Social determinants of health. <https://www.who.int/health-topics/social-determinants-of-health>. Accessed Mar 15, 2023.
2. Fazalulaha F, Taras J, Morris J, et al. From office tools to community supports: The need for infrastructure to address the social determinants of health in paediatric practice. Paediatr Child Health 2014;19(4):195-9.

Driver Diagram

```

graph TD
    Aim[To increase pediatric residents' proficiency in assessing SDOH] --> Knowledge[Knowledge]
    Aim --> Experience[Experience]
    Aim --> Attitudes[Attitudes]
    Knowledge --> SD1[What SDOH to ask about  
(e.g., IT HELLPS, adversity, resilience)]
    Knowledge --> SD2[How to ask about SDOH  
(e.g., non-judgmental, trauma-informed, culturally safe approaches)]
    Knowledge --> SD3[Why we should ask about SDOH  
(e.g., inform medical management, build rapport, preventative care, advocacy)]
    Experience --> SD4[First-hand experience asking about SDOH]
    Experience --> SD5[Second-hand experience observing others ask about SDOH]
    Attitudes --> SD6[Prioritization of psychosocial aspects of care]
    Attitudes --> SD7[Self-efficacy around ability to make impact on patients' SDOH]
    
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Resident/ Fellow/ SSR Posters

Dr. Emma McCrady / Ped Resident (PGY 2)

Faculty Supervisor: Dr. Erin Peebles, Dr. Matthew Carwana

Unseen and Unheard: Medical Student Perspectives on Interpreter Use and the Hidden Curriculum

Dr. Emma McCrady, Dr. Erin Peebles, Dr. Matthew Carwana

Read poster online:

[2024 CRD Poster Competition combined posters from Residents and Fellows.pdf \(ubc.ca\)](#)



UNSEEN AND UNHEARD

Medical Student Perspectives on Interpreter Use and the Hidden Curriculum

E. McCrady,¹ M. Carwana,² S. Lopez Steven,¹ and E. Peebles^{1,2,3}

1. Division of Hospital Medicine, Department of Pediatrics, University of British Columbia, Vancouver, BC; 2. BC Children's Hospital Research Institute, Vancouver, BC; 3. Center for Health Education Scholarship, University of British Columbia, Vancouver, BC



BACKGROUND

- A growing number of Canadians are speaking predominantly a language other than English or French at home (1).
- When healthcare and health information is provided in a non-preferred language, adverse outcomes have been noted (2-4).
- Professional interpreter services remain underused by pediatric residents in a variety of clinical situations (5).

EMERGING THEMES

System efficiency vs. patient-centred care:

"It's 6:30 in the morning, you have 20 patients to round on, so you're trying to get through all these patients. I think maybe in those scenarios, you just felt the pressure to quickly see a patient and move on and not really take the time to talk to them."

"If there's no uptake of those services or limited uptake of those services, and it's not expected that your consult might take twice the amount of time because you're having to speak through an interpreter, then you run into barriers as a learner who's being constantly assessed."

METHODS

- Primary data collection method: semi-structured interviews.
- Participants: third- and fourth-year medical students at the University of British Columbia
- Data Analysis: Thematic analysis, Braun and Clarke (2006)

OBJECTIVES

- To explore medical students' perceptions of interpreter use in inpatient medicine.
- To investigate the influence of the hidden curriculum on medical students' decision-making regarding interpreter use.
- To examine how the hidden curriculum impacts the professional identity of medical students in their interactions with patients with limited English/French proficiency.

EXPERIENCE SHAPING FUTURE PRACTICE:

"Seeing the level of appreciation that parents have to know what's happening to their child- I think it's so huge and you can't replicate it without an interpreter. If you see that enough and get that benefit enough, I think it will totally change your practice."

"From what I have seen, I think it can make such a difference in people's experiences in health care and improve their quality of care. I think it's something that should definitely be addressed and introduced early on."

DISCUSSION

- We aim to examine if underutilization of interpreter services and the influence of systems limitations are tied to medical students' decision-making.
- The findings may inform targeted interventions to address these issues, enhancing the quality of care for patients with limited English/French proficiency and shaping future healthcare professionals' practice patterns and professional identities.

REFERENCES



Resident/ Fellow/ SSR Posters

Dr. Paige Murphy / Ped Resident (PGY 3)

Faculty Supervisor: Dr. Aisling Young

Scanning for Success: perceived barriers and rates of completion of extended cardiac views on prenatal ultrasound before and after a targeted education session

Dr. Paige Murphy, Jennifer Lawless, Dr. Aisling Young

Read poster online:

[2024 CRD Poster Competition combined posters from Residents and Fellows.pdf \(ubc.ca\)](https://2024.CRD.Poster.Competition.combined.posters.from.Residents.and.Fellows.pdf(ubc.ca))



Scanning for Success: comfort levels and perceived barriers to completion of extended cardiac views on prenatal ultrasound before and after a targeted education session

Paige Murphy, MD; Jennifer Lawless, BSc, CRGS; Aisling A Young, MD FRCP



Introduction

- Congenital heart disease is the most common congenital anomaly, occurring in ~1% of live births.
 - 25% of congenital heart defects are defined as critical congenital heart defects (CCHD) which require immediate intervention.
- CCHD can be detected in one of five ways:
 - Prenatal ultrasound
 - Physical exam
 - Postnatal oximetry screening
 - At clinical presentation with cyanosis/shock
- On autopsy
- Prenatal detection of CCHD with ultrasonography allows appropriate prenatal counseling and decision making, preparation for birth in an appropriate center and early intervention.
- Vancouver Island (under the jurisdiction of Island Health) recommends routine anatomy ultrasounds for all pregnant patients at 18-20 weeks which includes three standard cardiac views which are the **outflow view, 4-chamber view and cardiac axis view**.
- In 2021, Island Health trained sonographers in three additional "extended" cardiac views which include the **3-vessel view, aortic arch view and bicaval view**.
- The goal is for these additional views to be completed for every 20-week anatomy scan, but as they are optional, their completion rates are variable.



Figure 3. Standard cardiac views (A-C) and Extended cardiac views (D-F) showing normal pathology, as performed during routine detailed prenatal ultrasound at 18-20 weeks.

Methods

- This project was developed in consultation with the lead sonographer of Island Health and local stakeholders, after which, ethics approval was completed.
- Current literature on fetal ultrasonography and CCHD detection was reviewed.
- This project was approached using the quality improvement Plan-Do-Study-Act (PDSA) framework.
- A survey assessing the comfort level of sonographers, completion rates and barriers to completion of all cardiac views was developed and distributed to sonographers on Vancouver Island in November 2023 (pre-intervention).
- A targeted education session performed by a pediatric cardiologist was completed in December 2023. This session reviewed normal fetal echocardiography findings and technique and then used a case-based approach to review abnormal pathology (TGA, AVSD, VSD, coarctation of the aorta).
- The same survey assessing the comfort level and barriers to completion of all cardiac views was again distributed to sonographers in January 2024 (post-intervention).
- Qualitative data was analyzed using thematic analysis.
- Using the PDSA framework for quality improvement projects, we will aim to tailor our next session to the themes that come out of our survey.
- Statistical analysis of the survey questions was completed to compare the response distribution in Pre- and Post-intervention groups, including median (IQR) and frequency (percentage) for scores of Likert scales. Pearson χ^2 or Fisher's exact tests were applied to compare pre and post intervention data.



Figure 2. Plan-Do-Study-Act Framework adapted from Institute for Healthcare Improvement workbook. Image from Louisiana Department of Health (Accessed March 2024).

Statistical analysis

Comfort level in imaging the standard vs. extended fetal heart views enabled by Pre- vs. Post. groups

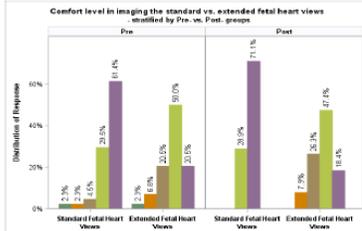


Figure 3. Self-reported sonographer comfort level with standard and extended fetal cardiac views before (Pre) and after (Post) an education session. Data was analyzed using Pearson χ^2 or Fisher's exact tests. The McNemar test was applied to take into account the possible dependence between variables. The comfort level when completing extended cardiac views is significantly less than standard cardiac views in both pre and post intervention distributions with a p-value of 0.0099 and 0.0037 respectively.

On a scale of 1 to 5, how comfortable do you feel imaging the 3-vessel view?

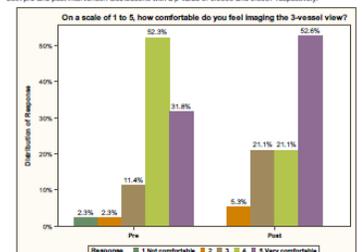


Figure 4. Self-reported sonographer technician comfort level with the three-vessel view (an extended cardiac view) before (Pre) and after (Post) an education session. Data was analyzed using Pearson χ^2 or Fisher's exact tests. There is a statistically significant difference between the pre and post intervention values ($P < 0.05$, $P = 0.0201$).

- Data was additionally collected and analyzed for all other standard and extended cardiac views, but was not found to be statistically significant.

Survey results and Qualitative Analysis

- Our survey was sent to all 125 sonographers employed by Island Health and 42 answered the pre-intervention survey, while 39 answered the post-intervention survey (response rate: 33.6% and 30.4%, respectively).
- Of the 125 sonographers invited, 45 were able to attend the education session (attendance rate: 36%).
- 87% of post-intervention participants noted that the education session increased their comfort level with extended heart views.
- When asked "what training would help you feel more comfortable with extended heart views", answers were analyzed and found to fit within 4 "themes":
 - Hands on training (9/50 responses)
 - General advice for success in fetal echocardiography (9/50 responses)
 - Further education in extended cardiac views (either generally or in specific scans such as the bicaval or aortic arch views) (12/50 responses)
 - Further instruction in abnormal/pathologic images (14/50 responses)
- Specific text examples were chosen below:
 - "Explanation of what abnormalities to look for when assessing bicaval or aortic arch. My difficulty is that I can't obtain the image, but I cannot determine if it is normal or not as I do not know what a subtle abnormal aortic arch or abnormal bicaval view would look like—is it subtle, is it obvious?"
 - "I'm comfortable with extended heart views, however any extra training with rounds, specifically showing different pathologies is helpful. So we not only know what normal looks like, but abnormalities that we can look for as well."
 - "More hands on training, seeing abnormalities would be beneficial as we don't see many."
 - "I always find fetal heart rounds helpful... I try for the bicaval and aortic arch but feel that I am less successful every time with both those views... I really enjoy imaging the heart and am always happy for more education. Thank you!"

Research Objective

- The aim of this quality improvement project is to identify barriers to routine completion of extended cardiac views by sonographers on Vancouver Island.
- We will then review rates of completion and comfort level with each view before and after an educational intervention.
- Ultimately, we hope to increase the number of extended cardiac ultrasound scans to increase our ability to detect CCHD prenatally.

Conclusions/Future Directions

- Sonographers report being less comfortable with extended fetal heart views compared to standard fetal heart views (Figure 3).
- An education session is an effective way to improve comfort level with specific ultrasound views, as evidenced by a statistically significant improvement in comfort level with the 3-vessel view post-intervention (Figure 4).
- Hands on training and further examples of abnormal pathology would be preferred topics for future education sessions based on qualitative analysis of survey responses.
- We will continue with repeated cycles of intervention with the aim of increasing comfort level and completion rates for all extended heart views using the Plan-Do-Study-Act framework.
- Future directions will include reviewing whether rates of prenatal diagnosis of CCHD are impacted by the implementation and completion of extended fetal cardiac views.

Resident/ Fellow/ SSR Posters

Dr. Jacqui van Warmerdam / Ped Resident (PGY 2)

Faculty Supervisor: Dr. Joseph Ting, Dr. Emily Kieran

Respiratory outcomes by five years of age among children born preterm: a population-based study using health services data

Dr. Jacqui van Warmerdam, Dr. Ye Shen, Dr. Lindsay Richter, Dr. Connie Yang, Dr. Sarka Lisonkova, Dr. Jonathan Wong, Dr. Ashley Roberts, Dr. Jeffrey Wong, Dr. Emily Kieran, Dr. Joseph Ting

Read poster online:

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Respiratory outcomes by five years of age among children born preterm: a population-based study using health services data

Jacqui van Warmerdam, Ye Shen, Lindsay Richter, Connie Yang, Sarka Lisonkova, Jonathan Wong, Ashley Roberts, Edmond Chan, Jeffrey Bone, Emily Kieran, Joseph Ting



Background

- Neonatal care advancements have led to increased survival of preterm infants, however many experience long-term respiratory complications.
- Preterm infants are at increased risk for long term respiratory morbidity due to incomplete in-utero lung development, and life-sustaining neonatal interventions.
- There is increasing evidence of risk of respiratory morbidity among preterm infants, but late preterm infants continue to be an understudied population.
- Our study uniquely leverages population-based data to characterize rates of respiratory morbidity up to 5 years of age.
- Our study is the first to characterize the rate of healthcare contacts for respiratory causes among preterm infants and provides insight to long term respiratory disease.

Methods

- A retrospective cohort of infants born in British Columbia between April 1, 2004 to December 31, 2014 were linked to population-based healthcare administrative data.
- Healthcare presentation for bronchiolitis, pneumonia, and asthma in the form of outpatient visits (clinic or emergency department), hospitalizations, and ICU admissions for were tracked using ICD-9 and ICD-10 diagnostic billing codes.
- Infants were followed to 5 years of age.
- Healthcare visit rate due to asthma, bronchiolitis, and pneumonia were compared between preterm and term infants (37-44 weeks GA) using Poisson regression.



Results

- Over the 10-year period, we followed 413,140 term infants, 33,227 infants born 34-36 weeks GA, 8362 infants 28-33 weeks GA, and 1231 infants 22-27 weeks GA.
- Children born 22-27 weeks GA had the highest rates of hospitalization for asthma (rate ratio (RR) 9.4), bronchiolitis (RR 10.5) and pneumonia (RR 15.9) when compared to term infants.
- Rates of ICU admission for asthma (RR 27.1) and pneumonia (RR 58.1) were highest among those born at 22-27 weeks GA.
- Increased rates persist among children born 34-36 weeks GA, with higher rates of hospitalization for asthma (RR 1.8), bronchiolitis (RR 2.1), and pneumonia (RR 1.8) compared to term infants.



Preterm infants experience significantly higher rates of healthcare visits, hospitalizations, and ICU admissions for respiratory causes compared to term infants.

Gestational Age	22-27 weeks	28-33 weeks	34-36 weeks
Asthma			
Output Visit	1.47 (1.31, 1.61)	1.82 (1.71, 1.93)	1.38 (1.31, 1.46)
Hospitalization	9.43 (7.51, 11.13)	5.39 (2.95, 9.72)	3.77 (1.64, 1.92)
ICU admission	27.66 (17.28, 46.37)	8.72 (3.71, 1.93)	2.22 (1.65, 1.94)
Bronchiolitis			
Output Visit	6.9 (6.32, 7.51)	2.88 (2.78, 2.98)	1.61 (1.60, 1.71)
Hospitalization	19.26 (15.83)	10.2 (4.2, 24.9)	2.11 (1.62, 2.78)
ICU admission	28.62 (20.81, 38.85)	7.92 (6.41, 9.85)	3.51 (2.70, 4.54)
Pneumonia			
Output Visit	4.57 (4.25, 4.94)	1.75 (1.69, 1.82)	1.27 (1.24, 1.30)
Hospitalization	18.1 (14.27, 22.79)	6.48 (3.14, 12.74)	1.84 (1.73, 1.96)
ICU admission	58.1 (46.56, 71.71)	6.82 (3.27, 14.24)	2.87 (1.93, 4.28)

Birth Data	22-27 weeks, n=1231 (0.3%)	28-33 weeks, n=8362 (2.0%)	34-36 weeks, n=8362 (2.0%)	37-44 weeks, n=413140 (100%)
Sex (Male)	646 (52.5)	4052 (48.4)	12360 (54.9)	212,298 (51.4)
Delivery Method				
Cesarean	808 (65.3)	4768 (57.0)	14,897 (62.3)	1,318,822 (31.8)
Vaginal	423 (34.3)	3594 (43.0)	8463 (37.7)	279,202 (68.2)
Multiple Birth	349 (28.3)	2465 (29.5)	6346 (28.1)	1,007 (0.2)
Birth Weight (kg), Median (IQR)	3.09 (2.65, 3.69)	3.49 (2.95, 4.03)	3.78 (3.24, 4.32)	3.40 (2.85, 3.92)
Mean Gestational Age	28.1 (2.0)	30.1 (1.9)	34.1 (1.8)	36.6 (1.6)
APGAR Score at Birth, Median (IQR)	7.5 (6.5)	7.5 (6.5)	7.5 (6.5)	7.5 (6.5)
Neonatal Interventions				
Age at Discharge (days), Median (IQR)	113 (57.2, 16.4)	113 (57.2, 16.4)	113 (57.2, 16.4)	113 (57.2, 16.4)
Smoking in Pregnancy	147 (11.9)	881 (10.5)	2845 (11.4)	26,197 (6.3)
Precautions/Restrictions	110 (8.9)	1,045 (12.5)	4,001 (16.4)	30,908 (7.5)
Diagnosis	81 (6.5)	1,063 (12.7)	4,100 (16.4)	26,118 (6.3)
Special Location	102 (8.3)	761 (9.1)	2,615 (10.5)	44,448 (10.8)
Cost	558 (45.3)	6,041 (72.0)	21,828 (88.4)	365,685 (88.1)
Neonatal Interventions & Early Respiratory Outcomes				
Medical and Respiratory Support	20 (1.6)	379 (4.5)	2,189 (88.4)	402,478 (97.7)
Oxygen	13 (1.1)	271 (3.2)	2,001 (81.2)	390,514 (94.5)
NIPPV	8 (0.7)	178 (2.1)	565 (22.2)	10,910 (2.6)
Mechanical Ventilation	1 (0.1)	1 (0.01)	1 (0.004)	1 (0.0002)
Days on Mechanical Ventilation, Median (IQR)	0 (0, 0)	0 (0, 0)	0 (0, 0)	0 (0, 0)
Respiratory Discharge	186 (15.1)	1,741 (20.8)	48 (0.2)	48 (0.01)
Rehospitalization	18 (1.5)	123 (1.5)	168 (6.6)	174 (0.2)
Mean Discharge Antibiotic Exposure	105 (8.5)	2,100 (25.2)	8,907 (35.8)	101,810 (24.7)
ICU Admissions	97 (7.8)	468 (5.6)	24,999 (100.0)	312,474 (75.9)

- Within the study population, the proportion of infants receiving neonatal respiratory interventions increased with decreasing GA.
- Hospitalization for asthma, bronchiolitis, or pneumonia in the first 5 years occurred in 28% of infants born 22-27 weeks GA, 11% of those born at 28-33 weeks GA, 7% of those born 34-36 weeks GA and 4% of infants born at 37-44 weeks GA. (Figure 1)



Figure 1. Proportion of infants who were hospitalized for bronchiolitis, pneumonia, or asthma over the 5 year follow up period, by gestational age.

Future Directions

- Account for potential confounders with an adjusted Poisson regression model on the rate of healthcare use for respiratory causes.
- Characterize risk factors associated with increased rates of respiratory outcomes with a multivariate analysis.
- Assess rate of asthma prescription fills among preterm infants.

Resident/ Fellow/ SSR Posters

Dr. Fahad Alotaibi / Pediatric Hospital Medicine Fellow

Faculty Supervisor: Dr. Claire Seaton

Serious bacterial infections in infants 90 days and younger associated with acute respiratory tract infections at BC Children's Hospital. A subgroup analysis of the READAPT-Kids BC Cohort: Clinical Characteristics and outcomes of hospitalized children with Acute respiratory infections in British Columbia

Dr. Claire Seaton, Dr. Fahad Alotaibi

Read poster online:

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Serious Bacterial Infections in Young Infants with Acute Respiratory Tract Infections

Fahad Alotaibi, Claire Seaton
Pediatric Hospital Medicine, British Columbia Children's Hospital, Canada

INTRODUCTION	PRELIMINARY RESULTS	Table 1. Demographics and clinical characteristics of the enrolled patients (N = 120)																																																							
<p>Acute respiratory tract infections (RTI's) are a prevalent cause of hospital visits among young infants, a population particularly vulnerable to coexisting serious bacterial infections (SBIs). SBI's such as urinary tract infections, bacteremia, and meningitis substantially elevate the risks of morbidity and mortality in this age group. Prior research has highlighted a low incidence of SBIs in infants with viral RTIs. However, comprehensive research focusing on regional variations in SBI prevalence and associated risk factors is scarce. This study seeks to fill this gap by determining the prevalence of concurrent SBIs and identifying key risk factors in infants aged 90 days or younger diagnosed with acute respiratory tract infections.</p>	<p>The study has enrolled 120 infants to date (Table 1); of these, 70 (58.3%) are male, and 105 (87.5%) were full-term births. The median (IQR) age at admission was 32.9 days (21.9, 52). The predominant clinical symptoms observed include cough (81%), fever measured in-hospital (16%), and fever reported by parents or caregivers (19%). Other significant symptoms are poor feeding (51%) and apnea (13%). The median (IQR) duration of respiratory symptoms was 3 days (2, 5). Data extraction and analysis is ongoing, will have more results of SBI soon..</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: #003366; color: white;"> <th>Characteristic</th> <th>Level</th> <th>n (%)</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Sex</td> <td>Male</td> <td>70 (58.3)</td> </tr> <tr> <td>Female</td> <td>50 (41.7)</td> </tr> <tr> <td rowspan="2">Gestational Age</td> <td>Term (\geq 37 weeks)</td> <td>105 (87.5)</td> </tr> <tr> <td>Preterm (< 37 weeks)</td> <td>15 (12.5)</td> </tr> <tr> <td rowspan="3">Underlying Condition</td> <td>Healthy</td> <td>108 (90)</td> </tr> <tr> <td>With co-morbidities</td> <td>10 (8.3)</td> </tr> <tr> <td>Unknown</td> <td>2 (1.7)</td> </tr> <tr> <td rowspan="15">Symptoms</td> <td>Fever (reported)</td> <td>23 (19)</td> </tr> <tr> <td>Fever (measured \geq38°C)</td> <td>19 (16)</td> </tr> <tr> <td>Cough</td> <td>97 (81)</td> </tr> <tr> <td>Coryza/nasal congestion</td> <td>92 (77)</td> </tr> <tr> <td>Shortness of breath</td> <td>9 (7.5)</td> </tr> <tr> <td>Increased WOB</td> <td>86 (72)</td> </tr> <tr> <td>Tachypnea</td> <td>17 (14)</td> </tr> <tr> <td>Apnea</td> <td>15 (13)</td> </tr> <tr> <td>Cyanosis</td> <td>7 (5.8)</td> </tr> <tr> <td>Dehydration/ low UOP</td> <td>17 (14)</td> </tr> <tr> <td>Diarrhea</td> <td>5 (4.2)</td> </tr> <tr> <td>Fatigue/lethargy</td> <td>28 (23)</td> </tr> <tr> <td>Irritability</td> <td>7 (5.8)</td> </tr> <tr> <td>Poor feeding/appetite</td> <td>61 (51)</td> </tr> <tr> <td>Wheezing</td> <td>6 (5)</td> </tr> <tr> <td>Vomiting</td> <td>16 (13)</td> </tr> <tr> <td>Rash (not hand/foot)</td> <td>3 (2.5)</td> </tr> </tbody> </table> <p style="font-size: small; margin-top: 5px;">WOB; work of breathing, UOP; urine output</p>	Characteristic	Level	n (%)	Sex	Male	70 (58.3)	Female	50 (41.7)	Gestational Age	Term (\geq 37 weeks)	105 (87.5)	Preterm (< 37 weeks)	15 (12.5)	Underlying Condition	Healthy	108 (90)	With co-morbidities	10 (8.3)	Unknown	2 (1.7)	Symptoms	Fever (reported)	23 (19)	Fever (measured \geq 38°C)	19 (16)	Cough	97 (81)	Coryza/nasal congestion	92 (77)	Shortness of breath	9 (7.5)	Increased WOB	86 (72)	Tachypnea	17 (14)	Apnea	15 (13)	Cyanosis	7 (5.8)	Dehydration/ low UOP	17 (14)	Diarrhea	5 (4.2)	Fatigue/lethargy	28 (23)	Irritability	7 (5.8)	Poor feeding/appetite	61 (51)	Wheezing	6 (5)	Vomiting	16 (13)	Rash (not hand/foot)	3 (2.5)
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<p style="text-align: center;">METHODS</p> <p>This was a retrospective, observational cohort study of infants, 90 days or younger admitted to BC Children's Hospital General Pediatric Inpatient Unit or PICU with a clinical diagnosis of a severe acute respiratory illness between July 1, 2022 and June 30, 2023. Cases were identified using ICD-10-CA codes, then manually screened for inclusion. Detailed clinical and demographic information was extracted including clinical outcomes and complications such as length of hospital admission, pediatric intensive care unit (PICU) admission, need for invasive mechanical ventilation, disposition, and death. This subgroup analysis was done from the READAPT-Kids study cohort (Clinical characteristics and outcomes of hospitalized children with Acute respiratory infections.)</p>	<p style="text-align: center;">CONCLUSION</p> <p>Understanding the local prevalence of SBI's in infants under 90 days of age admitted with an acute respiratory infection is important to validate previously published literature in our population. In addition, by identifying cases through clinical characteristics associated with ARI's, as well as positive microbiological samples, our dataset provides a unique description of potential risk factors associated with SBI's in this population. By enhancing our understanding of these infections, we aim to reduce unnecessary admissions, improve antimicrobial stewardship and improve overall patient outcomes.</p>																																																								

Resident/ Fellow/ SSR Posters

Dr. Natalia Diaz Pinzon / Development Pediatrics Fellow

Faculty Supervisor: Dr. Tim Oberlander

Autism and Second Language Exposure

Dt. Grace Iarocci, Dr. Tim Oberlander, Dr. Sarah Hutchison, Dr. Natalia Diaz Pinzon

Read poster online:

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Department of Pediatrics/Developmental Pediatrics

Autism and Second Language Exposure

Natalia Diaz Pinzon, Sarah M. Hutchison, Tim F. Oberlander, & Grace Iarocci

Background

Autism spectrum disorder (ASD) is characterized by differences in social communication and restrictive-repetitive behaviors that are present during early development and affect everyday functioning.¹

Executive function (EF) are higher cognitive processes such as working memory, inhibition, flexibility, and planning. Children with ASD are more likely to have difficulties in acquiring EF skills compared to their typically developing peers.²

Parents and professionals may be concerned that second language exposure will have a negative impact on EF and language skills in children with ASD.

Research Questions

1. Will parent ratings of language abilities and EF be significantly different between children with and without ASD?
2. Will there be differences between children with ASD who do or do not have an intellectual disability (IQ < 70)?

Knowledge Translation

This information may be useful to parents of children with ASD and clinicians on whether to support second language exposure, especially when there is a presence of an intellectual disability (IQ < 70).

What is the impact of second language exposure on cognitive and language skills in children with and without Autism?



Methods

We are currently analyzing existing data from 396 children (age 6-16 years) with and without ASD that has been collected by Dr. Grace Iarocci and her team at the SFU Autism and Disabilities lab.

We are using the EF and Functional Communication scales from the Behavior Assessment System for Children-Second Edition Parent Report to measure cognitive and language skills.

We are using parent reported measures of second language exposure.

IQ was measured using the English version of the WASI-II during a one-on-one assessment with the child.

References

1. American Psychiatric Association (2013). Diagnostic and statistical manual of mental disorders: DSM-5
2. Iarocci G, Hutchison S, O'toole G. Second Language Exposure, Functional Communication, and Executive Function in Children With and Without Autism Spectrum Disorder J Autism Dev Disord (2017) Jun;47(6):1818-1829.

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THINKING OF THE WORLD

Resident/ Fellow/ SSR Posters

Dr. Jad El Maamari / Hematology, Oncology and BMT Fellow

Faculty Supervisor: Dr. Rod Rassekh

Does treatment with Vincristine impact gait function in individuals who are at least 5 years post completion of childhood cancer treatment? A pilot study.

Dr. Jad El Maamari, Dr. Tim Bhatnagar, Dr. Karen Davies, Dr. Kristin Marr, Dr. Rod Rassekh

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VinGAIT pilot study: The effect of Vincristine on gait in Children



Jad El Maamari, Tim Bhatnagar, Rod Rassekh
 Pediatric Hematology Oncology, BC Children's Hospital, Vancouver BC Canada

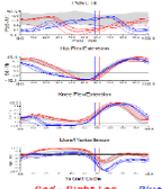
Introduction

- ⚡ Vincristine is one of the most used chemotherapy agents in pediatric cancer.
- ⚡ High rate of adverse reactions reported, especially severe peripheral neuropathies.
- ⚡ Some patients show long-term residual neuropathy despite symptomatic improvement.
- ⚡ Research shows that neuropathy caused by Vincristine affects walking patterns in children and adolescents.
- ⚡ Lack of research on its long-term effects post-treatment completion, especially in survivors beyond five years.

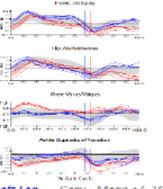
Methods ⚡ Prospective pilot study ⚡ 20 patients
 ⚡ Received last dose of VCR > 5 years ago ⚡ Was diagnosed with VIPN

3D Motion Capture - Kinematics

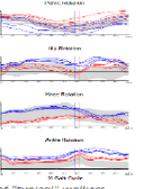
Sagittal Plane



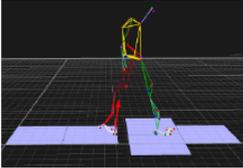
Coronal Plane



Transverse Plane



Red - Right Leg Blue - Left Leg Gray - Mean +/- 1SD of "typical" walkers

Results

⚡ Results will highlight any gait abnormalities that remain years after completion of therapy and whether there are any recurrent patterns of abnormalities when compared to healthy controls.

Conclusions

⚡ This pilot study will identify if children who received vincristine are at risk of developing significant long term gait abnormalities and will serve as justification for a larger trial of video gait assessment in long term survivors of childhood cancer.

There are no relevant conflicts of interest to disclose

Resident/ Fellow/ SSR Posters

Dr. Sanya Grover / Ped Medical Student (third year)

Faculty Supervisor: Dr. Matthew Carwana

Patient and caregiver perspectives of trauma-informed care in pediatric practice: a scoping review

Dr. Sanya Grover, Dr. Colleen Pawliuk, Dr. Devon Greyson, Dr. Britt Udall, Dr. Matthew Carwana

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Patient and Caregiver Perspectives of Trauma-Informed Care in Pediatric Practice: A Scoping Review

Sanya Grover^{1,3}, Colleen Pawliuk², Devon Greyson^{2,4}, Britt Udall^{1,3}, Matthew Carwana^{1,3}

¹Faculty of Medicine, University of British Columbia
²The Children's Hospital Research Institute
³Responsive Intersectoral Child and Community Health Education and Research (RICHER) Program
⁴School of Population and Public Health, University of British Columbia

Background	<ul style="list-style-type: none"> Children are at risk to experience trauma in many forms, including developmental or intergenerational, and those who experience childhood trauma are more likely to avoid health interactions (1-3) Trauma-informed care is a strengths-based, patient-centered approach that involves promoting cultural safety, establishing trust in relationships, and honoring resiliency (1) While many frameworks may exist, current literature shows that providers do not feel prepared to implement these skills More importantly, patient and caregiver perspectives are often missing from this research As such, the objective of this review is to map perspectives of patients, caregivers, and healthcare providers on trauma-informed care practices for children and youth
Research Questions	<ol style="list-style-type: none"> 1. What evidence exists regarding care provider perspectives on best practice guidelines for trauma informed care in pediatric settings? 2. What evidence exists patient and/or caregiver perspectives on best practice guidelines for trauma informed care in pediatric settings?
Eligibility Criteria	<ul style="list-style-type: none"> Inclusion criteria: <ul style="list-style-type: none"> <input type="checkbox"/> Participants: Perspectives of healthcare providers, pediatric patients (18 years and younger), and their caregivers, receiving care in healthcare settings <input type="checkbox"/> Concept: Trauma-informed care approaches and best practices <input type="checkbox"/> Context: Inpatient and/or outpatient healthcare settings of any geographical location and cultural context Exclusion Criteria: commentary or opinion articles
Methods & Preliminary Results	<ul style="list-style-type: none"> The scoping review will be conducted with the Joanna Briggs Institute methodology Databases searched were: MEDLINE, Embase, PsycINFO (EBSCOhost), Scopus, CINAHL (EBSCOhost), Social Work Abstracts (EBSCOhost), Academic Search Complete (EBSCOhost) and Google Scholar A total of 1972 articles were identified for initial screening Screening and data extraction will occur independently in duplicate. Data will be presented as a narrative summary

Figure 1 – Realms of different adverse childhood experiences (ACEs) (4). This diagram showcases the different aspects of household, community, and environment factors that can impact a child's health, wellbeing, and development.

Figure 2 – The Four R's of Trauma Informed Care (5). This model is one example of existing frameworks and focuses on realizing the impacts of trauma and potential paths for recovery, recognizing signs and symptoms of trauma, responding by integrating knowledge into policies and practices, and resisting re-traumatization of patients and their caregivers.

Hypothesis	<ul style="list-style-type: none"> Our primary hypothesis is that there will be a paucity of evidence outlining patient or caregiver preferences for trauma-informed care in the pediatric population We suspect majority of the evidence will be focused on care provider perspectives We hypothesize some barriers to implementing trauma-informed care for providers may be inadequate training and limited resources
Significance	<ul style="list-style-type: none"> To our knowledge, there has been limited to no published research on patient and caregiver perspectives on this topic Actively valuing and including these missing patient and caregiver perspectives have the potential to further guide our understanding of trauma-informed care and ultimately create frameworks that are most relevant to them Furthermore, this review can shed light on how the experiences and expertise of individuals who are marginalized and oppressed are often excluded in policy development (6) The findings can spark meaningful dialogue and partnerships with vulnerable communities to assess and reform best practice guidelines
References	<p>(1) Healing Families. <i>Healing Families: A Trauma-Informed Practice Guide for Working with Children, Youth and Families</i>. 2017.</p> <p>(2) McLaughlin, E. The Effects of Trauma on the Brain Development of Children: Evidence-Based Practices for Supporting the Resilience of Children in Care. <i>CHILD FAMILY COMMUNITY ACQUISITION</i>. 2018.</p> <p>(3) Finkelhor, D., Browne, G., Browne, G., & Browne, G. et al. Relationship of Childhood Abuse and Traumatic Experiences to Years of the Leading Causes of Death in Adults. <i>American Journal of Orthopsychiatry</i>. 1989; 59(4): 570-575.</p> <p>(4) Resnick, H. <i>ACEs: A Guide to Practice</i>. 2018.</p> <p>(5) Canadian Council of Public Health and Services for a Trauma-Informed Approach. <i>Substance Abuse and Mental Health Services Administration</i>. 2014.</p> <p>(6) Chawla, N., & Naman, M. <i>Global New Review in Medicine</i>. (2014) 1(2): 279-311. https://doi.org/10.1007/s12078-014-0010-7</p>
Acknowledgements	<p>This work is conducted on the traditional, ancestral, and unceded territories of the Coast Salish people, including the m̓iwaqw̓em̓ (Muscogean), Skwam̓i'm̓em̓ (Squamish), and səllwəw̓əy̓ (Tsilhq̓'waut̓h) Nations. This project is funded by the BC Children's Hospital Research Institute Summer Studentship. Special thanks to RICHER Program and partners, including OPSC, Canadian Pediatric Society, and the UBC Faculty of Medicine Department of Pediatrics for their ongoing mentoring, guidance, and allyship. For more information, please see the QR code below:</p>

Resident/ Fellow/ SSR Posters

Dr. Catherine Njeru / Hematology, Oncology and BMT Fellow

Faculty Supervisor: Dr. Caron Strahlendorf

A Glimpse into the chance of saving the eye- a case series of retinoblastoma patients treated with intra-arterial chemotherapy

Dr. Catherine Njeru, Dr. Caron Strahlendorf

Read poster online:

[2024 CRD Poster Competition combined posters from Residents and Fellows.pdf \(ubc.ca\)](https://www.ubc.ca/2024-CRD-Poster-Competition-combined-posters-from-Residents-and-Fellows.pdf)



BC CHILDREN'S HOSPITAL
An Agency of the Provincial Health Services Authority

Can we save the Eye? A look back at the intra-arterial chemotherapy experience for retinoblastoma at BCCH

Catherine Njeru, MBChB, Mmed¹; Caron Strahlendorf, MB, FRCPC, FCP¹
¹. Division of Pediatric hematology, Oncology and BMT, British Columbia Children's Hospital (BCCH), Vancouver, Canada



INTRODUCTION

- Retinoblastoma (RB) is a relatively rare tumor of childhood that accounts for about 3% of the cancers occurring in children younger than 15 years.
- The goals of treatment are first and foremost to achieve cure, to preserve vision and decrease the risk of late sequelae from treatment.
- Intra-arterial chemotherapy (IAC) is the technique of delivering chemotherapy to the local arterial system of the eye. It has been adopted by many tertiary centers as an option for up front treatment, but rates of globe salvage are not well reported.
- This is partly due to heterogeneity in practice as regards the combination of drugs infused, the number of cycles given, and the stage of disease at which this treatment is offered.
- Our objectives were to determine the globe salvage rate after IA chemotherapy for retinoblastoma at BCCH, and to describe the characteristics of the patients whose avoided enucleation.

INTRA-ARTERIAL CHEMOTHERAPY DELIVERY

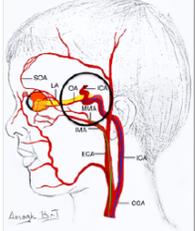


Figure 1: Selective ophthalmic artery chemotherapy is performed by passing the catheter via ICA through the femoral artery into the OA ostium. (route marked in blue) Alternate route is catheterization of MMA via ECA and IMA. (route marked in green)²

². Manjandavida, F.P. et al (2019). *Indian Journal of Ophthalmology*

TABLE 1. Stage of Disease, Treatment and Outcome

Stage at Dx	Year of IAC	No. of agents	Cycles	IA Treatment	Eye Salvaged
Group D	2008	1	6	Melphalan x 6	No
Group B	2017	1, then 3	4	Melphalan x 2, x Triple IA x 2	Yes
Group B	2016	1, then 3	6	Melphalan x 2, Triple IA x 4	Yes
Group D	2019	3, then 2	3	Triple IA x 2, Double IA x 1	No
Group B	2020	2	3	Double IA x 3	Yes
Group D	2020	2	3	Double IA x 3	No
Group D	2020	2	3	Double IA x 3	No
Group D	2021	3	1	Triple IA x 1	Yes
Group E	2021	3	3	Triple IA x 3	Yes
Group D	2021	3	3	Triple IA x 3	Yes

METHODS

- Database search through Cerner for all BCCH patients who underwent IA chemotherapy from Jan 2007- Dec 2017.
- Chart review was done. Age at diagnosis, hereditary status, stage of disease at diagnosis, the combination of drugs infused, as well as the number of cycles given were reviewed and analyzed
- The International Classification of Retinoblastoma (ICRB) staging classification system was applied. It is based on tumor size, location, and associated seeding, and can reliably predict chemo reduction outcome.¹

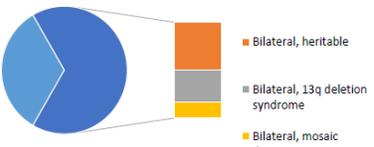
Group A = retinoblastoma up to 3 mm in size
 Group B = retinoblastoma more than 3 mm in size, macular location, or minor subretinal fluid
 Group C = retinoblastoma with localized seeds
 Group D = retinoblastoma with diffuse seeds
 Group E = massive retinoblastoma necessitating enucleation

¹. Shields CL, Shields JA. *Curr Opin Ophthalmol*. 2006 Jun

RESULTS

- 9 children diagnosed with retinoblastoma received IA chemotherapy, which was delivered to a total of 10 eyes [one patient with bilateral disease had the procedure done to both eyes]
- Median age of diagnosis was 16 months
- Two thirds of this cohort had bilateral disease
- Overall globe salvage rate of 60%.
- In cases of advanced retinoblastoma (Group D and E), salvage rate was lower at 50%
- In all cases, IAC was used in conjunction with either systemic and/ or further local treatment
- IAC was offered either as single agent melphalan, double agent (melphalan and topotecan) or triple agent (carboplatin, melphalan and topotecan)
- Median of 3 cycles of IA chemotherapy offered

Figure 2: Distribution of patients by type of disease



CONCLUSION

- IAC, achieved a globe salvage rate of at least 50%, even in advanced RB, and will likely continue to be an important component of treatment, especially in children with bilateral disease.
- There is need for larger cohort studies with homogenous practice and an adequate follow up period to provide higher level evidence on this treatment modality

Resident/ Fellow/ SSR Posters

Dr. Nicole (Nikki) Tyminski / Adolescent Health and Medicine Fellow

Faculty Supervisor: Dr. Anita Datta, Dr. Katelynn E. Boerner, Dr. Sheila K. Marshall, Dr. Jennifer S. Coelho

Ketogenic diets for children and youth with epilepsy: Exploring long-term impacts on eating behaviour

Dr. Tanya Pardiwala, Dr. Nicole Tyminski, Dr. Anita Datta, Dr. Katelynn E. Boerner, Dr. Sheila K Marshall, Dr. Jennifer S. Coelho

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Ketogenic diets for children and youth with epilepsy: Long-term impact on eating behaviors and quality of life

T Pardiwala^{1,2}, N. Tyminski, MD, FRCPC^{1,2}, A.N. Datta, MD, FRCPC^{1,2}, Pei-Yoong Lam, MD, FRCPC^{1,2}, Katelynn Boerner, PhD, Rpsych^{1,4}, Sheila Marshall, PhD³, Jennifer S. Coelho, MA, PhD, RPsych^{1,2}

BC Children's Hospital¹, UBC Department of Psychiatry², UBC Department of Pediatrics³, UBC Department of Psychology⁴

INTRODUCTION

Drug-resistant epilepsy (DRE) is defined as failure of adequate trials of two tolerated, appropriately selected, antiepileptic drugs to achieve sustained seizure freedom (1). DRE affects approximately 25- 35% of youth with a diagnosis of epilepsy.

The ketogenic diet (KD), a high-fat, low carbohydrate, and adequate protein diet and is an evidence-based treatment for children and youth experiencing DRE. When followed strictly, the KD can decrease seizure frequency in youth with DRE by more than >70% experiencing 50% reduction (2).

Although the KD can reduce seizure frequency, the strict diet can pose an increased burden on the youth's and families' quality of life (QOL) which may result in discontinuation of the KD (3, 4). Further understanding a family's perspectives, barriers, and beliefs has the potential to enhance pre-KD counselling and supports provided by their healthcare team.

The purpose of our study is to examine the impact of a time-limited dietary intervention for DRE on eating behavior and quality of life.

OBJECTIVE

The aim of our study is to explore families' experiences while supporting their child with a dietary intervention for DRE to examine potential barriers and facilitators to this intervention.

This is study was part of a larger study investigating also comparing eating pathology, somatic symptoms , and QOL.

METHODS

Our study is a single center, cross-sectional design using narrative inquiry to explore and examine families' experiences while supporting a youth on the KD for DRE.

We invited participants with DRE who had previous experience with the KD (KD group) or who had not used this dietary intervention (comparison group). We are presenting the results of 12 care-providers describing their family's experience with the KD to treat their child's DRE using open-ended questions (please refer to the QR code to access a list of the questions).

RESULTS

The questionnaires were reviewed as a whole and then organized into entries specific to each family. Themes and categories were drawn and currently being analyzed. Below are examples of family responses:

"We have nothing but positive things to say about keto-it gave us our son back"

"She did stop getting invites to bday parties because people thought she would feel left out"

"It was overwhelming and was very expensive - meal prep took 3 times longer"

"Prior to the diet she was very adventurous with food and would eat everything...she will go for several months only eating the same food"

Themes/sub-themes under review:

Effects the KD has on QOL, social experiences/ opportunities, relationship with food, physical and emotional aspects, and financial concerns. Many families found the advantages outweighed the disadvantages would be do it again if offered:

YES

58%

NO

25%

?

17%

NEXT STEPS

Complete the narrative inquiry analysis and finalize the themes highlighting the family experience post-KD for youth with DRE. Share the family experience with the clinic to provide a assess and potentially improve current counselling strategies, teaching, and follow-up guidance prior to starting the KD for youth with DRE.

LIMITATIONS

- It is important to acknowledge the personal biases and life experiences that may impact the qualitative interpretation of a family's expressed experience.
- This study relies on individuals retrospectively reflecting on their experiences potentially resulting in over- and under-reporting.
- The sample size (n=12) for the completed surveys used for the narrative inquiry is small and may not be generalized to a greater population.

CONTRIBUTORS




REFERENCES/ MATERIAL



ACKNOWLEDGEMENTS

This study received support for a Clinical and Translational Research Seed Grant from the Brain, Behaviour & Development theme (awarded to Katelynn Boerner & Dr. Karen Mabilangan).