



Alberta Children's Hospital
ANNUAL REPORT 2020 (June 2019 to May 2020)

Pediatric Emergency Research Team



Mission

To improve outcomes
for acutely ill and injured
children by creating and
sharing new knowledge

Vision

Exceptional acute care for
children through innovation
and discovery

Background



Summary

*The emergency department (ED) at the Alberta Children's Hospital provides care to acutely ill and injured children 24 hours a day, seven days a week. During the past 12 months over **75,000** children received care in the Alberta Children's Hospital ED. The high volume and diversity of patients seen in the ED provides a unique opportunity for generating new knowledge and improving the quality of pediatric care. Our research team is one of the largest pediatric emergency teams in Canada. Team members contributed to the science of COVID-19 epidemiology and pandemic response, resuscitation, precision medicine, quality improvement and simulation. In the past year we published **68** peer reviewed articles and received over **\$12 million** dollars in peer reviewed funding from local, national and international sources.*

Year in Review: June 1, 2019 – May 31, 2020

CLINICAL CARE

EXCEPTIONAL CARE FOR OVER

75,000 Children

PROVIDED BY A TEAM OF

61 Physicians

AND

183 Nurses

RESEARCH

THE RESEARCH TEAM ENROLLED OVER

1,313 patients

AND GENERATED

68 publications

WITH GRANT FUNDING TOTALING

\$12,941,202

PRINCIPLE INVESTIGATOR OR CO- PRINCIPLE INVESTIGATOR

\$12,707,364

CO-INVESTIGATOR OR COLLABORATOR

\$233,838

EDUCATION

APPROXIMATELY

300 Medical Trainees

Including medical students, residents and fellows were trained in the ACH ED

Who we are

Physicians

Antonia Stang

Section Chief, Pediatric Emergency Medicine

Graham Thompson

Research Lead, PERT

Adam Cheng

Simulation Research Lead

Stephen Freedman

*Alberta Children's Hospital Foundation,
Professor in Child Health and Wellness*

Vincent Grant

Simulation Medical Director

David Johnson

*Senior Medical Director, AHS, Maternal, Newborn,
Child & Youth Strategic Clinical Network (MNCY SCN)*

Kelly Millar

Education Lead

Jennifer Thull-Freedman

*Medical Director for Quality and Safety,
Alberta Children's Hospital*

50+ Emergency Department Physicians

Pediatric Emergency Medicine Fellows

Hilary Ambrose

Katie Anker

Jason Baserman

Robyn Buna

Anne-Josee Cote

Nicholas Monfries

Research Nurses

Ruza Goulden

Karla Jansen

Kristen Kersey

Jelena Komanchuk

Coordinators/Research Assistants

Rebecca Emerton

Myka Estes

Joy Gobran

Larisia Hladun

Ashley Jones

Ellena Kim

Kelly Kim

Nidhi Lodha

Karen Lowerison

Beata Mickiewicz

Kassi Prisie

Sarah Williamson-Urquhart

Jianling Xie

50+ Volunteer Research Assistants

*(Pediatric Emergency Medicine Research
Assistant Program PEMRAP)*

Research Trainees

Anna Funk

Post-Doctoral Fellow

Kaden Lam

Summer Student

Madison Riddell

Pediatric Resident

Sarah Tougas

Medical Student

Administration

Shayla Baier

Jenny Godden

Rosanna Sandbeck

Gertrud VanDerMey

Highlights



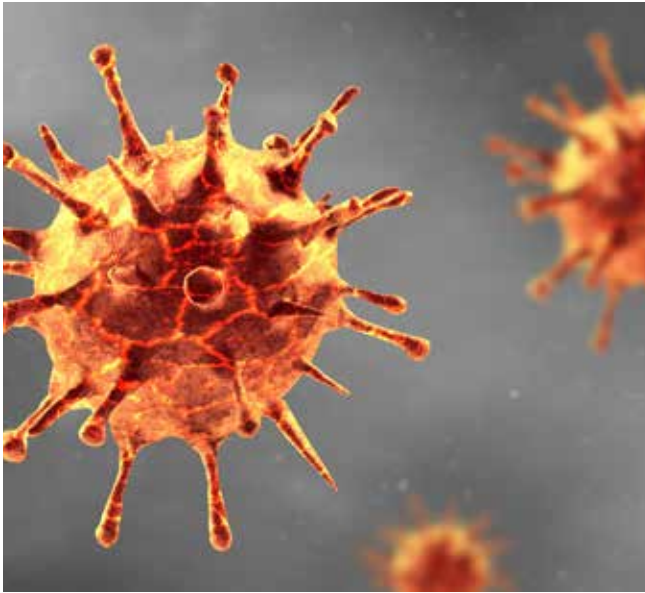
Awards and Significant Achievements:

- 1) **Adam Cheng received the John G. Wade Visiting Professorship for Patient Safety and Simulation-based Medical Education.** Royal College of Physicians and Surgeons of Canada. This visiting professorship is awarded to a distinguished educator to visit a Royal College-accredited simulation centre in Canada each year, to promote the use of simulation in medical education, and its applications to improving patient safety. This past year, Dr. Cheng visited The Hospital for Sick Children in Toronto, Canada, sharing his expertise in resuscitation, cardiac arrest, simulation-based research and clinical debriefing. During his visit, Dr. Cheng met with leaders of the local simulation program to help build a vision for the future, mentored young investigators, and provided a blueprint for improving outcomes from in-hospital cardiac arrest.
- 2) **Stephen Freedman received The Alberta Children's Hospital Foundation Professorship in Child Health and Wellness – 2020 – 2025 (renewal).** This award is in recognition of his outstanding research which has focused on applying clinical research to improve outcomes in children seeking emergency department care. He uses innovative, multidisciplinary approaches to solve complex problems and this has led to the publication of over 150 peer-reviewed manuscripts. He is the principal investigator on numerous multicentre, multinational studies from prestigious funding agencies including the Canadian Institute of Health Research (CIHR), the Public Health Agency of Canada, the National Institute of Health, and Alberta Innovates.

As leaders of the Commitment to Comfort QI Collaborative, Drs. Thull-Freedman and Stang have received numerous awards, including a Patient Experience Award from the Health Quality Council of Alberta and an Alberta Health Services President's Excellence Award for Outstanding Achievement in Quality Improvement.



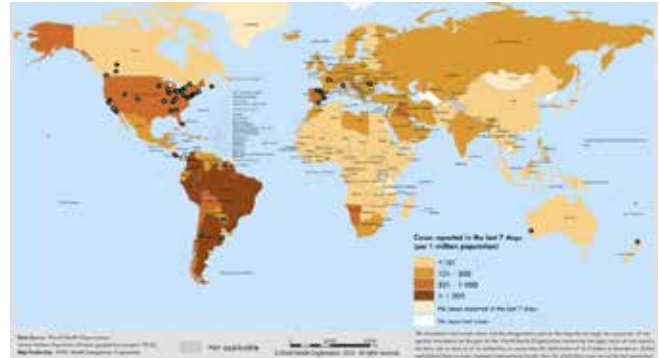
- 3) **Jennifer Thull-Freedman and Antonia Stang – 'Commitment to Comfort QI Collaborative' was selected as the Best Emergency Medicine Quality Improvement Project at the American Academy of Pediatrics National Conference and Exhibition.** Improving the treatment of children's pain in Alberta's ED's" was selected as the Best Emergency Medicine Quality Improvement Project at the American Academy of Pediatrics National Conference and Exhibition, held in New Orleans in October 2019. Dr. Thull-Freedman and Dr. Stang led a collaborative of 40 emergency departments across the province of Alberta that worked together using quality improvement methods to improve management of children's pain. As leaders of the Commitment to Comfort QI Collaborative, Drs. Thull-Freedman and Stang have received numerous awards, including a Patient Experience Award from the Health Quality Council of Alberta and an Alberta Health Services President's Excellence Award for Outstanding Achievement in Quality Improvement.



COVID-19 Research

PERN (Pediatric Emergency Research Network) COVID-19 Study

The emergence of the COVID-19 outbreak has provided an important rationale to evaluate and describe the clinical course of disease in children with COVID-19. Given the rapid spread of the SARS-CoV-2 virus, it has been critical to study its epidemiology and outcomes as efficiently as possible using existing infrastructures. As a result, Dr. Stephen Freedman, with the support of the Alberta Children's Hospital Research Institute and the Cumming School of Medicine's Clinical Research Fund, secured CIHR funding to conduct a 57-site, 14-country prospective cohort study. The study is being conducted by a global research consortium (Pediatric Emergency Research Network), which the Alberta Children's Hospital's Pediatric Emergency Research Team (PERT) is a member. The study will enroll a total of 12,500 children who are tested for SARS-CoV-2 infection. Epidemiological and demographic information, clinical characteristics, and disease outcomes, will be collected. Analyses will identify risk factors for SARS-CoV-2 infection, and/or severe COVID-19 outcomes.



The course of SARS-CoV-2 related disease in children is not yet well understood. With funding secured by Dr. Stephen Freedman from the Public Health Agency of Canada, this active surveillance program will recruit children who present to an ED for medical care across Canada's 15 tertiary care pediatric EDs – all of which are members of Pediatric Emergency Research Canada (PERC).

A Pediatric Emergency Research Canada (PERC) – Public Health Agency of Canada (PHAC) COVID-19 Surveillance Collaboration

The course of SARS-CoV-2 related disease in children is not yet well understood. With funding secured by Dr. Stephen Freedman from the Public Health Agency of Canada, this active surveillance program will recruit children who present to an ED for medical care across Canada's 15 tertiary care pediatric EDs – all of which are members of Pediatric Emergency Research Canada (PERC). The goal is to recruit 4 pediatric patients per day at each site. The PHAC Surveillance Registry will include data regarding exposure history, clinical symptoms, the ED visit and outcomes. Follow-up phone-calls will occur 14 and 90 days following the index ED visit. The 14 day call will explore short-term complications; the 90 day call will evaluate chronic symptoms. The registry will include both SARS-CoV-2 test positive and negative children thereby creating a detailed repository of data that allows us to compare children with COVID-19 infection to those infected with other viruses. Sites will attempt to enroll all SARS-CoV-2 positive case.



Household transmission dynamics and viral load among asymptomatic SARS-CoV-2 infected children

SARS-CoV-2 infected children tend to have milder disease than adults and many even have no symptoms. We do not know how likely asymptomatic infected children are to transmit the infection to others. Gaining an understanding of this issue is crucial to determining the role children play in transmission of the virus and what risk they will be to other children and adults in the community (e.g. returning to school). With funding secured by Dr. Stephen Freedman from CIHR, ACHRI and the Cumming School of Medicine's Clinical Research Fund, children under 18 years of age will be enrolled from 20 emergency departments across Canada and the United States through a collaboration with the PERC and PERN networks. Participating sites will enroll 400 asymptomatic SARS-CoV-2 positive children and 1,200 uninfected children. Over a 90-day follow up period, data related to exposures, epidemiological risk factors, symptoms, additional SARS-CoV-2 testing performed, household composition and presence of symptoms in the household will be collected. Additionally, all positive specimens collected will have viral load quantification performed. Analyzing and modelling all of this information, comparing households with transmission versus those without, will help us better understand the transmission risk posed by asymptomatic SARS-CoV-2 infected children. This data can help inform public health policy as it relates to school re-openings and social distancing practices.

Front-line workers in EDs have faced heightened levels of professional and personal risk and stress during the COVID-19 pandemic. In this qualitative study, health care providers and support staff in EDs across the country are participating in focus groups to determine the impact of COVID-19 on their lives.

COVID-19. What families think and do?

Parents are faced with significant challenges in caring for their sick and injured children during the COVID-19 pandemic. This international survey aims to understand what decisions parents are facing in relationship to seeking health care advice and treatments, personal protection and potential vaccine research.

Emergency provider's experiences during the COVID-19 pandemic: a qualitative study of Canadian pediatric emergency departments

Front-line workers in EDs have faced heightened levels of professional and personal risk and stress during the COVID-19 pandemic. In this qualitative study, health care providers and support staff in EDs across the country are participating in focus groups to determine the impact of COVID-19 on their lives.

Impact of COVID-19 on adverse outcomes and resource utilization in children presenting to Canadian pediatric emergency departments with suspected appendicitis

In children with appendicitis, delays in presentation to the emergency departments are associated with worse outcomes, including severe infection and prolonged hospital stays. In this study we will evaluate the outcomes of children who visit the ED for suspected appendicitis during the COVID-19 pandemic, a time period when parents/caregivers try to comply with stay-at-home guidelines.



Precision Medicine

PRIMED

What is precision medicine?

Precision medicine takes into account an individual's symptoms, exposures, genetic, molecular and environmental characteristics to improve health care diagnostics, management and research. Each of us is unique and when we are ill, we present with varying symptoms. Precision medicine techniques are used to determine the specific clinical characteristics, laboratory results and genetic sequences (genomics) with their translation (transcriptomics) into proteins (proteomics) and biochemical changes (metabolomics). Using large clinical databases and next-generation technologies we can evaluate the vast amount of complex reactions occurring in our bodies during health and illness. With this data we can identify combinations of clinical and biological markers (bio-profiles, similar to a fingerprint) that can help to improve diagnosis and tailor specific management strategies.

PRIMED (PRrecision medicine for Improving the diagnosis and Management of children with suspected appendicitis presenting to the Emergency Department)

Our team has previously identified a bio-profile that distinguish children with appendicitis from those with other causes of abdominal pain. To make sure that this profile can be used as an accurate diagnostic tool, in this current study we are evaluating children with abdominal pain and suspected appendicitis from 11 Canadian children's hospital emergency departments. Specifically, we will measure blood metabolites and proteins that are involved in appendicitis at our UCalgary laboratories. Our aim is to develop a future point-of-care test that can provide

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health care staff rapid, accurate information to help make a diagnosis right at the bedside! (Funded by Canadian Institutes of Health Research)



HIRPA (Host Immune Response in Pediatric Appendicitis)

As a child's immune system works to fight infection it releases and activates a whole host of different types of blood cells. These cells have many different roles, including destroying harmful bacteria and releasing proteins that control inflammation. Thanks to novel technologies (cytometry time of flight – CyTOF) at the University of Calgary, we will be able to determine specific blood cell sub-types that are present in children with appendicitis, and whether these cells have been called to action (activated). We will specifically be examining sub-groups of macrophage cells. (Funded by the Clinical Research Fund, Cumming School of Medicine and Alberta Health Services.)

SLICED (Systemic and Local Immune landscape of Children presenting to the Emergency Department with suspected appendicitis: Innovation through Multiplex Ion Beam Imaging)

The brand new Multiplex Ion Beam Imaging (MIBI) equipment at the University of Calgary is the first of its kind in Canada, and our team will be some of the initial scholars to use this cutting edge technology. By using MIBI, we will take a deep dive into the sub-cellular structure of pathology samples from children who had surgery for appendicitis. We will determine which specific cell sub-types are present, whether they are activated and precisely where they are located in relationship to each other and surrounding local tissues. We will compare these results to those found in the blood using CyTOF (HIRPA study) and to the inflammation proteins analyzed by Luminex technology (PRIMED study) to provide an expansive landscaping of the immune response in children with suspected appendicitis. Funded by the Department of Pediatrics, UCalgary.

The brand new Multiplex Ion Beam Imaging (MIBI) equipment at the University of Calgary is the first of its kind in Canada, and our team will be some of the initial scholars to use this cutting edge technology.

Precision Probiotics in Kids with Diarrhea?

Dr. Stephen Freedman and the PERT team recently lead a multi-centre study evaluating the use of a probiotic in children with diarrhea (<https://www.nejm.org/doi/full/10.1056/NEJMoa1802597>). That study, which recruited 886 children in 6 Canadian hospitals, found, to many people's surprise that the probiotic evaluated provided no clinical benefits to the children enrolled. To follow-up these results, the team partnered with virologists at Alberta Precision Laboratory and the University of Alberta to study whether the effects varied by etiologic agent (i.e. by the actual virus causing the diarrhea) and to determine if there were benefits in terms of expedited virus eradication, indicative of a benefit too subtle to be detected clinically. The study, published in Nature Communications (<https://www.nature.com/articles/s41467-020-16308-3>) found no virus-specific beneficial effects attributable to the probiotic, either in reducing clinical symptoms or viral nucleic acid clearance from stool specimens collected up to 28 days following enrollment. This study provides pathophysiological and microbiologic evidence to support the clinical findings and conclude that probiotics should not be routinely administered to children with acute gastroenteritis, regardless of the infecting virus.

Pediatric Emergency Medicine Research Associate Program (PEMRAP)

Since 2009, undergraduate students have had the extraordinary opportunity to develop research skills through experiential learning in the ED at ACH working as volunteer research assistants. Fully integrated into PERT, 65 PEMRAP research assistants contributed 3,883 volunteer hours to 6 studies led by PERT investigators and partnering study teams during the past year. Our volunteers benefit from the mentorship of our research nurses and research coordinators as they gain experience interacting with patients, families, and the clinical team. Over 350 students have participated in this program since its inception.

“This opportunity has given me a strong foundation in the world of research by exposing me to impactful clinical research projects and the chance to work closely with patients, nurses and research coordinators. Working with these individuals has strengthened my ability to work collaboratively within a team, as well as build valuable relationships for my future academic and professional endeavors. The relationships I developed with fellow students and other researchers have contributed to my development as an academic by exposing me to a professional environment where I was able to develop my critical thinking, problem-solving skills and communication skills.”

– Alyssa Wilkins, 4th year B.Sc. Kinesiology (Hons), PEMRAP Volunteer





Trainees

Sarah Tougas: Prevalence of *C. difficile* Detection in Asymptomatic Children

Sarah Tougas, a University of Calgary medical student has been leading a project designed to quantify the rate of asymptomatic *C. difficile* colonization in children across the age spectrum. While *C. difficile* has the potential to cause illness in children, and asymptomatic colonization of children under two years of age has been well described in the literature, there is a very limited understanding of the evolution of colonization as children grow. Gastrointestinal pathogen multiplex PCR testing, which includes *C. difficile*, is being used more frequently for children presenting with gastrointestinal symptoms. As a result, more children will be tested for *C. difficile*, and physicians will need to decide which children require treatment. To address this issue, with funding from the Emergency Strategic Clinical Network, Sarah is conducting a systematic review and meta-analysis to explore the prevalence of childhood asymptomatic colonization with *C. difficile* stratified by age. Sub-analyses will also be conducted based on geography, testing method, and decade to improve our understanding of the prevalence. Our research aims to provide context to physicians as they interpret positive *C. difficile* results in children.

Madison Riddell and Kaden Lam: A Comparative Evaluation of Publication Bias Between Pediatric Probiotic and Antibiotic Studies

In today's era of evidence-based medicine, physicians largely rely on knowledge translation and the timely publication of findings from clinical trials in readily accessible journal articles. The caveat to this approach is the potential for publication bias or, the tendency to submit or accept manuscripts for publication based on the direction or the strength of the study findings, which has the potential to distort the reported data available in

current literature. Probiotic research may be particularly susceptible to publication bias because a large number of these studies are industry funded. As such, Madison Riddell, a pediatric resident at the Alberta Children's Hospital, and Kaden Lam, conducted a project designed to determine if publication bias plays an even greater role and should be a particular concern when interpreting the results of probiotic studies and systematic reviews. To evaluate the potential for publication bias related to the use of probiotics in children, we sought to compare the publication rates and characteristics of pediatric probiotic clinical trials registered in clinicaltrials.gov with that of commonly prescribed antibiotics in children. This data will be further analyzed to determine whether certain factors, such as results (positive vs. negative) and funding source, influence the likelihood of publication.

Anna Funk: COVID-19

Dr. Anna Funk has collaborated as a co-Principal Investigator on two multi-site, international, CIHR-funded, pediatric COVID-19 prospective cohort studies. The first study, PERN-COVID-19, will enroll 12,500 children in a quest to identify predictors of SARS-CoV-2 infection and of severe COVID-19 disease in children. This study has already enrolled over 4,000 children, in 48 sites in 14 countries! The second study, which was very recently funded, will identify and follow asymptomatic children with (400 children) and without (1,200 children) SARS-CoV-2 infection in order to explore household transmission dynamics at 20 sites located in Canada and the United States. This asymptomatic study began as a pilot at Alberta Children's Hospital in June 2020, and will expand to other sites in the coming months.

Anna Funk: Pediatric Acute Gastroenteritis

Dr. Funk has also been working on multiple pediatric gastroenteritis-related projects since she joined the PERT team in October 2019. Most of her work in this topic is exploring data collected as part of the APPETITE study. She is completing a manuscript exploring the ability to identify pathogens in children presenting to the emergency department with isolated vomiting, and comparing this to children with other symptom complexes. A second manuscript is being prepared that will analyze APPETITE data alongside provincial databases in order to describe and determine the long-term outcomes of children whose stool contains *C. difficile* and to assess the benefits of antibiotic therapy in infected children. Dr. Funk also recently submitted an invited review on non-antibiotic therapies for infectious gastroenteritis to *Current Opinions Infectious Diseases*.

Pediatric Emergency Medicine Fellows Scholarly Projects

Grants awarded:

Anne-Josée Cote. *2019 Norman Saunders Complex Care Initiative National Grant Competition.* Patient-reported experiences and outcomes for the care of children with medical complexity and palliative care needs in the ED. \$46,830

Nicholas Monfries. *Department of Pediatrics Innovation Award Endowment, University of Calgary Cumming School of Medicine.* An App to Combat Healthcare Provider Burnout in the Pediatric Emergency Department. \$1,800

Projects in progress:

Nicholas Monfries. *BurnEDout: A Novel App to Reduce Burnout in the Emergency Department.* Burnout is a syndrome experienced by a growing number of healthcare professionals and has the potential to result in a number of negative professional and personal consequences. Healthcare professionals practicing in high acuity areas, such as the ED are at a heightened risk of burnout syndrome, with the potential to negatively impact patient care. Though a variety of strategies to prevent burnout have been suggested in the literature, including resiliency and mindfulness training, there is a paucity of evidence on feasible interventions targeted towards healthcare professionals, especially in a multidisciplinary setting. Smartphone applications have increasingly been utilized to deliver educational material and may be an effective tool to deliver resiliency training to busy professionals. This study aims to evaluate the impact of resiliency training delivered through a smartphone application on burnout amongst healthcare professionals in the pediatric ED.

Katie Anker. *Exploring Pediatric Emergency Physician's Self-Assessment of their Practice Patterns Prior to the Introduction of a Physician's Data Dashboard.*

Anne-Josée Cote. *Families' experiences with pediatric palliative care and complex care in the Emergency Department*

Anne-Josée Cote. *Emergency providers experiences during COVID.*

Anne-Josée Cote. *Experiences of Canadian physicians during the COVID-19 pandemic: a survey study.*

Completed projects:

Jason Baserman. *Patient Preferences in the Use of Topical Anesthetic in the Alberta Children's Hospital Emergency Department.* Needle procedures are a source of significant pain and distress for children visiting the emergency department. To inform our quality improvement targets, Dr. Baserman surveyed patients age 8-17 years to understand their preferences regarding topical anesthetic use before needles. Seventy-five percent of preteen patients (age 8-12 years) and fifty-eight percent of adolescent patients (13 to 17 years) would prefer that topical anesthetic be applied prior to receiving a needle if the product functions immediately. If they must wait 30 minutes for the product to take effect, 54% of preteens and 34% of adolescents desire topical anesthetic. The desire for topical anesthetic declines with age but does not differ according to gender. Patients that had previously used topical anesthetic were significantly more likely to want topical anesthetic than those who had not previously used topical anesthetic.

Robyn Buna. *Interrater reliability in completing Entrustable Professional Activities (EPAs) in a simulation environment.* As medical education in Canada shifts towards competency based medical education, residents are required to demonstrate competence by having observations of entrustable professional activities (EPAs), which are considered key components of the discipline. Simulation may be a suitable environment to assess residents on their EPAs. Simulation has the advantage of being safe and reproducible, with the ability to identify poor performance in a low-stakes environment. The reliability of EPA observation data in a simulated environment has not been investigated. This study aims to determine the interrater agreement between two preceptors for EPAs during simulation for first-year emergency medicine residents.

Hilary Ambrose. *Use of inflammatory markers in pediatric emergency care.*



Partnerships/Collaborations



BIKE

The BIKE (Bicycling Injuries in the Kids and the Environment) study is a national CIHR funded study led by Dr. Brent Hagel (PhD epidemiologist, Department of Pediatrics, Cumming School of Medicine) which is looking at the determinants of bicycling injuries in children and adolescents. Every year in Canada, bicycling results in 20 deaths, 1,800 hospital admissions and 4% of all ED visits for those under 15 years old. The PERT team is currently identifying child and adolescent bicyclists who present to the ACH ED. The members of the BIKE team then collect data and conduct location audits to identify site characteristics associated with injury. The results of this work will inform urban planning policies to make bicycling safer for children.

KOALA

KOALA (Kids' Outcomes and Long-term Abilities) is KOALA is a prospective, multicentre longitudinal cohort study of children aged 6 months to 6 years led by Dr. Miriam Beauchamp (Montreal, QC). Mild traumatic brain injury (mTBI) is highly prevalent, especially in children under 6 years of age. However, relative to older children and adults, little research has focused on the consequences of mTBI early in development. The objective of KOALA is to document the impact of early mTBI on a wide range of domains including children's physical, cognitive, social, and behavioural functioning, as well as quality of life, stress, sleep, and brain integrity. The study includes children who sustain either an mTBI (n = 100) or an orthopaedic injury (injured control group, n=50) recruited from three pediatric emergency departments in Canada, and typically developing children of the same age (n=50) recruited from the community. A comprehensive battery of prognostic and outcome measures are conducted in the emergency department, at 10 days, as well as 1, 3, and 12 months post-injury. Neurobiological measures, including measures of brain structure and function (magnetic resonance imaging), stress (hair cortisol), sleep (actigraphy) and genetics (saliva) complement direct testing of function using developmental psychology and neuropsychological methods and parent questionnaires.

Improving pediatric acute mental health care for children and youth in Canada

Mental health and substance use disorders pose critical challenges for children, youth, and families. Suicide is the 2nd leading cause of death in youth and young adults, and mental illnesses are the leading causes of child and youth disability. Children, youth, and families in crisis need multidisciplinary, family-centred care informed

by approaches that pinpoint risk, inform treatment, and consider family needs and preferences. Yet, these approaches are not routinely integrated into care in Canada's EDs. In response to these critical limitations, our team is leading the way in evaluating how changes in the delivery of pediatric acute mental health care for children and youth can improve outcomes.

An Innovative Model of Acute Pediatric Mental Health and Addictions Care is an Alberta Innovates funded study led by Drs. Stephen Freedman and Dr. Amanda Newton (Edmonton, AB). Alberta's two pediatric EDs are involved in this prospective, pragmatic, 29-month quasi-experimental study that is evaluating the effect of a novel acute mental health and addictions care bundle. The acute care bundle comprises 3 components: 1) assessing self-harm risk at triage, enabling risk stratification; 2) use of a direct, brief, mental health evaluation for those who screen as high risk for self-harm at triage; and 3) implementation of shared decision-making approach in post-ED follow-up care. The overarching goal of this study is to deliver the right care at the right place and time for our patients and families. This study has partnered heavily with hospital leadership and administration, ED physicians and nurses, and emergency, inpatient and outpatient psychiatry services.

A Multi-Disciplinary, Patient-Partnered, Pan-Canadian, Comparative Effectiveness Evaluation of an Innovative Acute Pediatric Mental Health and Addiction Care Bundle is a CIHR funded study led by Drs. Stephen Freedman and Amanda Newton (Edmonton, AB). With the support of research institutes and health care delivery organizations from coast to coast, eight pediatric EDs across Canada are involved in this comparative effectiveness cluster randomized controlled trial. The purpose of this trial is to compare the effectiveness of the novel acute mental healthcare bundle first introduced in our Alberta-based cohort study, to the delivery of ED mental healthcare in children nationally. The primary outcome is improvement in wellbeing 30 days after an ED visit among children and youth who sought care for mental health and substance use concerns. This study reflects partnerships between emergency and mental health/psychiatry service providers across the country and is supported by funding provided by local research institutes, health care providers, and national mental health agencies.

Reporting



Publications:

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2. Bal C, AlNajjar M, **Thull-Freedman J**, Pols E, McFetridge A, **Stang AS**. *Patient Reported Experience in a Pediatric Emergency Department*. J Patient Exp. 2020 Feb;7(1):116-123.
3. Bhatt M, Cheng W, Roback M, **Johnson D**, Taljaard M. *Impact of timing of pre-procedural opioids on adverse events in procedural sedation*. Acad Emerg Med. 2020 (Jan); <https://doi.org/10.1111/acem.13913>.
4. Bialy L, Fenton T, Schulhan-Kilroy J, Kromm S, McNeil D, **Johnson D**, Hartling L. *Vitamin D and perinatal outcomes: an overview of reviews*. BMJ Open. 2020 Jan 20;10(1):e032626. doi:10.1136/bmjopen-2019-032626.
5. Chartier LB, Mondoux SE, **Stang AS**, Dukelow AM, **Dowling SK**, Kwok ESH, Trivedi SV, Tepper J, Lang E. *How do emergency departments and emergency leaders catalyze positive change through quality improvement collaborations?* CJEM. 2019 Jul;21(4):542-549.
6. **Cheng A**, Bhanji F. *A Call to Action: The Future of Simulation-based Research in Emergency Medicine in Canada*. CJEM. 2020. 22(1):8-10. DOI:10.1017/cem.2019.481
7. **Cheng A**, Chartier L, **Dowling SK**, et al. Rowe B, *Choosing Wisely Canada's Emergency Medicine Recommendations: Time for a revision*. CJEM. November 2019, vol 21 (6) pg 710.
8. **Cheng A**, Eppich W, Kolbe M, Meguerdichian M, Bajaj K, **Grant V**. *A Conceptual Framework for the Development of Debriefing Skills – A Journey of Discovery, Growth and Maturity*. Simulation in Healthcare. 2020. 15(1):55-60. DOI:10.1097/SIH.0000000000000398
9. **Cheng A**, Kessler D, Lin Y, Tofil N, Hunt EA, Davidson J, Chatfield J, Duff J. *Influence of CPR Coaching and Provider Role on Perception of CPR Quality during Simulated Pediatric Cardiac Arrest*. Pediatric Critical Care Medicine. 2019; 20(4):e191-e198. doi: <https://doi.org/10.1097/PCC.0000000000001871>
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13. Doan Q, Wong H, Meckler G, **Johnson D**, **Stang A**, Dixon A, Sawyer S, Principi T, Kam AJ, Joubert G, Gravel J, abbour M, Guttmann A; for Pediatric Emergency Research Canada (PERC). *The impact of pediatric emergency department crowding on patient and health care system outcomes: a multicenter cohort study*. CMAJ. 2019 Jun 10;191(23):E627-E635
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Funding

1. **Cheng A (Co-Investigator)**. Medical Council of Canada, Research in Clinical Assessment Grant Program. *Exploring the augmentation of Behavioral Observations with Why They Were Exhibited*. **\$37,420**. July 1, 2019 – June 30, 2020.
2. **Dowling S (PI)**. ESCN. *What are the most effective strategies to reduce computed tomography usage in the Emergency Department?* **\$15,000**. April 2020
3. **Freedman SB (PI)**, Funk A, Florin T, Kuppermann N, Dalziel S, Klassen T, Plint A, Malley R, Salvadori M, Neuman M, Tancredi D, Payne D. Canadian Institutes of Health Research – Operating Grant: COVID-19 – Clinical Management. *Clinical Characteristics and outcomes of Children Potentially Infected by SARS-CoV-2 Presenting to Pediatric Emergency Departments*. **\$788,631**. February 1, 2020 – January 31, 2022.
4. **Freedman SB (PI)**, Funk A, Klassen T, Dalziel S, Florin T, Kuppermann T. Alberta Health Service – University of Calgary – Clinical Research Fund. *Clinical Characteristics and Outcomes of Children Potentially Infected by 2019 nCoV presenting to Pediatric Emergency Departments*. **\$10,000**. February 1, 2020 – January 21, 2020.
5. **Freedman SB (PI)**, Kellner J, Berenger B, Vayalumkal J, Funk A, Tipples G, Hu J, Stang A. Alberta Health Service – University of Calgary – Clinical Research Fund. *Asymptomatic SARS-CoV-2 Detection in Children and Transmission Dynamics*. **\$35,000** (plus **\$35,000** matching funds). April 1, 2020 – March 31, 2022.
6. **Freedman SB (PI)**, Newton A, Waylak T, Cherry J, Joubert G, Mater A, Rasiah J, Taljaard M, Stang A, Wright B, Finkelstein Y, Lipman E, Sareen J, Eltorki M, Stubbs M, Bertholet S, Gagnon I, Macdonald L, Porter R, Sawyer S. Canadian Institutes of Health Research – Operating Grant: SPOR Innovative Clinical Trial Multi-Year Grant. *A Multi-Disciplinary, Patient-Partnered, Pan-Canadian, Comparative Effectiveness Evaluation of an Innovative Acute Pediatric Mental Health and Addiction Care Bundle*. **\$3,000,000** (plus **\$3,092,800** in matching funds). April 1, 2020 – March 31, 2024
7. **Freedman SB (PI)**, Tarr G, Chui L. Alberta Health Services – University of Calgary – Clinical Research Fund. *Contribution and Interaction of Shiga Toxin Subtypes of Escherichia coli O157:H7 Virulence*. **\$10,000**. July 1, 2019 – June 30, 2020.
8. **Freedman SB (PI)**, Tarr P, Goldstein S, Casper C, Pavia A, Chui L, Schnadower D (Co-PI). National Institutes of Health; National Institutes of Allergy and Infectious Diseases. *Volume Expansion in Children with Shiga Toxin-Producing E. coli Infection to Prevent or Mitigate Hemolytic Uremic Syndrome: Planning a Multinational Randomized Clinical Trial*. **\$222,699** USD July 1, 2019 – June 30, 2020.
9. **Freedman SB (PI)**, Zemek P. Public Health Agency of Canada – Immunization Partnership Fund – Emerging Issues Fund Program. *National Pediatric SARS-CoV2, Emergency Department-Based Surveillance Study*. **\$500,500**. April 1, 2020 – March 31, 2021.
10. **Grant V** (Supervising Investigator). Alberta Innovates Summer Research Studentship Award. *Utilization of AR and VR to Improve Pediatric Airway Skills Training*. **\$6,000**. 2019.
11. **Grant V** (Supervising Investigator). NSERC Undergraduate Student Research Award. *Augmented Reality Enhancements for Pediatric Training Simulators*. **\$6,000**. 2019
12. **Grant V** (Supervising Investigator). O'Brien Centre Summer Studentship Award. *Using Virtual and Augmented Reality to Enhance Patient Care in Strenuous Transport Situations*. **\$6,000**. 2019
13. **Johnson D (Co-Investigator)**, Abdullah K (PI), Plint A (PI). CIHR Operating Grant Data Analysis – RMCHYH. *Evaluating the risk of asthma at age 5 and 10 years in children diagnosed with bronchiolitis during infancy – a study merging emergency department-based clinical data from the Canadian Bronchiolitis Epinephrine Steroid Trial (CanBEST), and the Bronchiolitis Severity Cohort (BSC) study to routinely collected provincial health administrative databases (HAD)*. **\$74,925**. April 2020 – Mar 2021.

14. **Johnson D (Co-Investigator)**, Plint A (PI), Lung Health Foundation (Ontario Lung Association). *Risk of Asthma in children diagnosed with bronchiolitis during infancy: a longitudinal study linking emergency department-based clinical data to provincial health administrative databases.* **\$26,316.** July 2020 – June 2021.
15. **Johnson D (PI)**. eMental Health for Youth and Young Adults. PRIHS Alberta Innovates, \$1,000,000; matching funding from Alberta Children's Hospital Foundation for \$1,900,000, and Alberta Health for \$1,900,000; CIHR SPOR iCT Rewarding Success Operating Grant. **\$100,000.** July 2020 – June 2023.
16. Novak K, **Dowling S (Co-Investigator)**. Choosing Wisely Alberta Grant. *Can we improve the use of gastroscopy to investigate dyspepsia in otherwise healthy adults in Alberta?* Sharing Choosing Wisely guidelines, current practice patterns and resources to optimize appropriate use. **\$95,177.** June 2019.

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