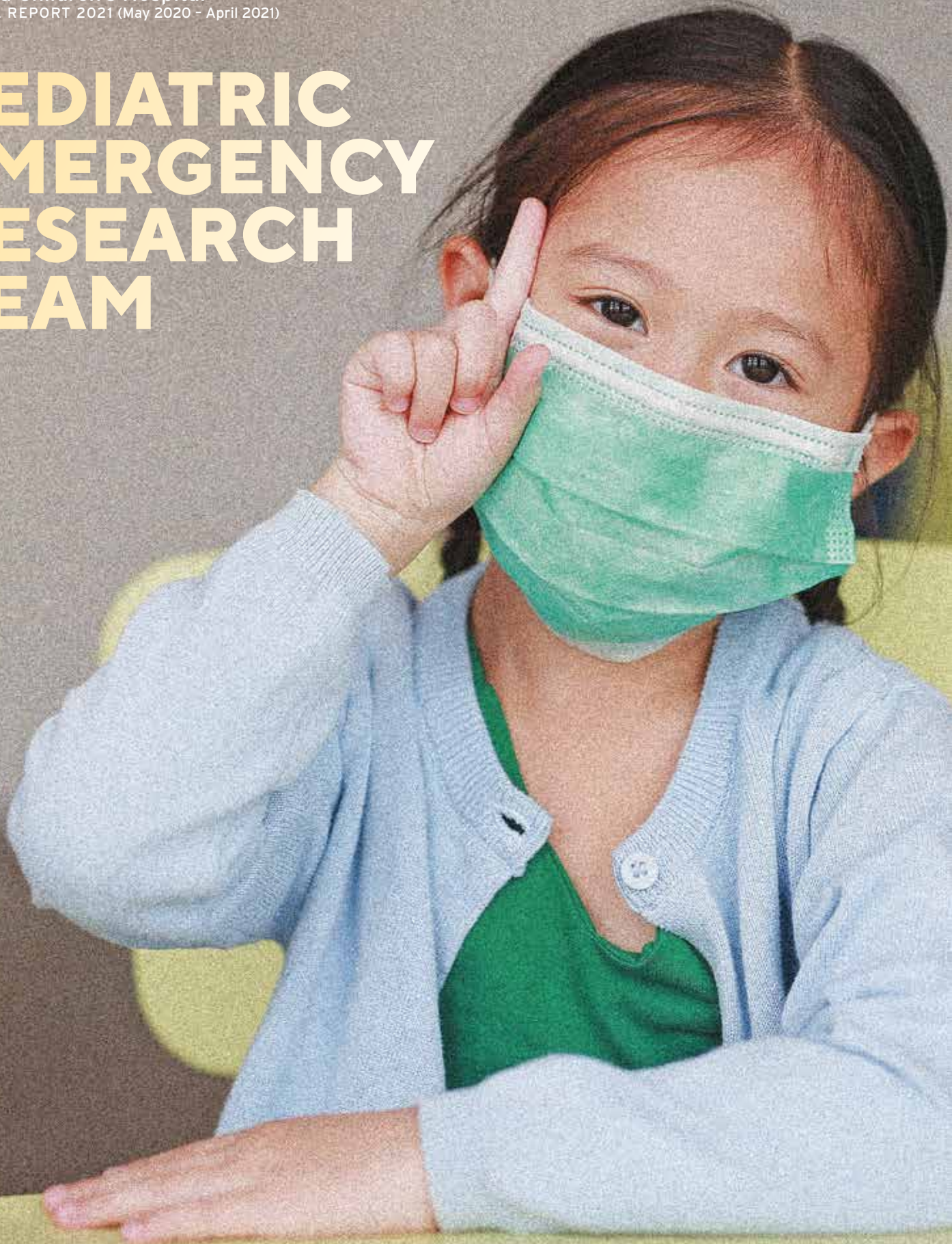


Alberta Children's Hospital
ANNUAL REPORT 2021 (May 2020 - April 2021)

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

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 month over **47,438** 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 expanding our understanding of the epidemiology of COVID-19 which guided the national pandemic response. We managed to continue our other research programs focused on resuscitation, precision medicine, quality improvement and simulation. In the past year we published **89** peer reviewed articles and received over **\$4,928,889** dollars in peer review funding from local, national and international sources.

Year in Review: May 1, 2020 – April 30, 2021

Clinical Care

Exceptional care for over

47,438 Children

Provided by a team of

61 physicians

And

170 Nurses

Research

The research team enrolled over

1,691 patients

And generated

89 publications

With grant funding totaling

\$4,928,889

Principle investigator or co-principle investigator

\$2,558,583

Co-investigator or collaborator

\$2,370,306

Education

Approximately

180 Medical Trainees

Including medical students, residents and fellows were trained at 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

Medical Director for eSIM Provincial Simulation

David Johnson

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

Kelly Millar

Education Lead

Jennifer Thull-Freedman, MD, MSc

Physician Lead for Quality, ACH Emergency Department, Clinical Associate Professor, University of Calgary

50+ Emergency Department Physicians.

Pediatric Emergency Medicine Fellows

Anne-Josée Cote

Gloria Yoo

Grazyna Burek

Katherine Anker

Nick Monfries

Omar Damji

Research Nurses

Karla Jansen

Kristen Kersey

Ruza Goulden

Sarah Weisbeck

Coordinators/Research Assistants

Alicia Kanngiesser

Alissa Kazakoff

Amanda Bishop

Ashley Jones

Beata Mickiewicz

Conné Lategan

Ellena Kim

Jacinda Larson

Jianling Xie

Joy Gobran

Kassi Prisnie

Kathleen Winston

Kelly Kim

Mahzabin Ferdous

Myka Estes

Nidhi Lodha

Rebecca Emerton

Sarah Williamson-Urquhart

Sunil Bhadani

50+ Volunteer Research Assistants

(Pediatric Emergency Medicine Research Assistant Program PEMRAP)

Research Trainees

Anna Funk

Post-Doctoral Fellow

Conné Lategan

Graduate Student

Sarah Williamson-Urquhart

Graduate Student

Madison Riddell

Pediatric Resident

Sarah Tougas

Medical Student

Kaden Lam

Summer Student

Milan Heck

Summer Student

Matthew Lau

Graduate student

Administration

Gertrud VanDerMey

Heather Numrich

Shayla Baier

Tracey Boyle



Highlights

Awards and Significant Achievements

Dr. Adam Cheng

- Jan 2021** Researcher of the Year – Society for Simulation in Healthcare, awarded for excellence in simulation-based research and significant impact on the field
- Dec 2020** INSPIRE Research Award – Impact of Aerosol Box Use on Patterns of Contamination during AGMPs

COVID-19 Research

PERN (Pediatric Emergency Research Network) COVID-19 Study

This global, prospective cohort study, funded by CIHR and led by Dr. Stephen Freedman, has collected a vast amount of epidemiologic, clinical, and outcome data from children who were tested for SARS-CoV-2 infection in emergency departments (ED) around the globe. **We have recruited over 10,000 children who presented for care to 1 of 41 participating pediatric EDs across 11 countries** including over 3,100 children who were positive for SARS-CoV-2 infection. Our team is conducting real time analyses which has led to several manuscript submissions already as well as numerous presentations to local, provincial, national and international groups tasked with making guideline decisions and recommendations regarding the management of COVID-19 in children. Most notably, we were invited to present our findings as the Presidential Plenary address at the Pediatric Academic Societies 2021 annual conference, and we have been invited to present on numerous occasions to the World Health Organization. The study is expected to complete recruitment on June 15th, 2021.

In addition to participating in the PERN COVID-19 Study, families recruited at the Alberta Children's Hospital were also able to permit their clinically collected specimens to be further tested using a novel technology available at the University of Calgary. The technique employed, termed **digital droplet Polymerase Chain Reaction (ddPCR)**, is a clinically validated approach being employed on COVID-19 specimens by Dr. Dylan Pillai (Pathology and Laboratory Medicine) and his team which has greater ability to detect low levels of SARS-CoV-2 nucleic acid and also provides a precise quantification. We are now exploring how viral load correlates with clinical disease in COVID-19 infected children.

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

This PERC-PHAC collaboration, led by Drs. Stephen Freedman and Roger Zemek (Ottawa), has brought together all of Canada's 15 pediatric EDs in a joint effort to generate important pediatric knowledge to inform the fight against COVID-19. This past year, this surveillance project has succeeded in providing timely, detailed, and systematic data on children who are tested for SARS-CoV-2 infection in Canada's pediatric EDs to PHAC. **This national initiative has rapidly enrolled over 4,700 children, including over 500 children who tested positive for SARS-CoV-2.** Given the success of the program to date, PHAC has extended our recruitment period for an additional year during which the focus of study will shift to include vaccination status, variants of concern, and long-term outcomes.

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

The CIHR-funded, asymptomatic SARS-CoV-2 study, which launched recruitment in January 2021, is designed to identify and follow children who present to an EDs for medical care without any COVID-19 symptoms yet test positive. During the follow-up period, the study assesses how many household contacts then develop COVID-19 symptoms. SARS-CoV-2 positive children are matched to similar children who test negative for SARS-CoV-2 infection. **This study remains in its recruitment phase in 14 institutions across Canada and the United States with 24 positive children and 84 negative controls enrolled to date.** As a direct result of the ever-changing pandemic landscape, the study has revised its protocol to implement important questions and additional testing related to variants of concern.





Pediatric Emergency Medicine Research Associate Program (PEMRAP)

Over the past year PEMRAP volunteer research assistants have demonstrated an extraordinary level of commitment to our program, studies and collaborators.

“Over the past few months, PEMRAP has become an oasis away from the digital world for me to continue connecting physically (though still distanced) with others. Be it with the research team, the clinical team, or journeying alongside patients and their families in making their experience in the emergency department more meaningful. Before joining PEMRAP, I had a desire to pursue a career in the healthcare field. Joining PEMRAP has not only re-affirmed that desire but allowed me to integrate pursuing clinical research as a part of my future endeavors. I give my time to focus on research because I enjoy being a part of the process that seeks to improve healthcare practices delivered to patients, families, and healthcare in general. I get to learn a lot about myself, how I work in various scenarios allowing me to develop a sense of self-awareness and practice self-reflection to help me improve my skills along the way with the help and support of my fellow PEMRAP colleagues.”

Adesua Egbase

PEMRAP Volunteer

Bachelor of Science, Kinesiology, Mind Sciences, 2021

“As an undergraduate student in Health Sciences, I’m driven to pursue a career in the realm of either research or medicine (or both). While I’ve performed bench research steadily for the past few years, I’ve also been exposed to the clinical research environment through PEMRAP. My time in the emergency department – interacting with patients, families, and the clinical team – has allowed me to appreciate research in the clinical setting, which I would not have otherwise been exposed to. Overall, volunteering with PEMRAP has introduced me to an environment that features both research and clinical care, which helps me in deciding my career path and future plans.”

Marcus Pehar

PEMRAP Volunteer

Bachelor of Health Sciences, Biomedical Sciences,
First Class Honours, 2021

Mental Health

PRIHS Mental Health Study: Implementing Innovative Models of Pediatric Acute Mental Health and Addictions Care

The PRIHS Mental Health Study is an implementation project focused on improving pediatric mental health and addictions care in the emergency department (ED) and improving patient's subsequent connections to urgent follow-up after the ED visit. Through the project, we are implementing and evaluating an integrated, evidence-based acute care bundle designed to deliver family-centred emergency mental health and addictions care.

The project launched in February 2020 at Alberta's two pediatric tertiary care hospitals – The Alberta Children's Hospital in Calgary and Stollery Children's Hospital in Edmonton.

Throughout the past year, we have seen an unprecedented volume of pediatric patients seeking mental health care in the ED which has pushed the ability to deliver mental health care to children and their families. Nonetheless, when implementation was launched in February 2021, team members across the institution (ED physicians, nurses, ED-based and follow-up care mental health team members, psychiatrists) rose to the challenge and were ready to implement a novel model of care. **Between May 1, 2020 and April 30, 2021, 585 participants were enrolled in this study at the Alberta Children's Hospital alone.** Participation involved providing information about well-being and satisfaction at baseline, as well as 1, 3 and 6-month follow-up. We extend a huge thank you to the families for participating and to all the staff members involved in making this implementation a success!

Through the project, we are implementing and evaluating an integrated, evidence-based acute care bundle designed to deliver family-centred emergency mental health and addictions care.

Translational Simulation Research

Aerosol-generating medical procedures (AGMPs), such as bag-valve-mask (BVM) ventilation, laryngeal mask airway insertion (LMA), and endotracheal intubation are commonly required for critically ill COVID-19 patients. AGMPs produce airborne particles, contributing to the disproportionately high risk of infection amongst health care providers working in acute care areas. To minimize HCP exposure during high-risk AGMPs, an aerosol box has been developed to place over the head of the patient, shielding the provider's face from aerosols. **During the COVID-19 pandemic, members of our research team have developed and utilized an adapted version of the aerosol box for the management of COVID-19 patients undergoing AGMPs.** In this CIHR-funded study, we are working to: 1) determine if aerosol boxes are effective in reducing provider and environmental contamination during performance of AGMPs by a trained airway team; 2) evaluate if using an aerosol box adversely affects time to completion and first pass success rates for endotracheal intubation and LMA insertion by a trained airway team; and 3) describe the patterns of contamination after commonly performed AGMPs.



Trainees

Anna Funk

COVID-19, Pediatric Acute Gastroenteritis

Dr. Anna Funk continues to collaborate as a co-Principal Investigator on two multi-site, international, CIHR-funded, pediatric COVID-19 prospective cohort studies. The first study, PERN-COVID-19, aims to describe the clinical characteristics of SARS-CoV-2 infection in children, and to report children's outcomes after 14 days and 3 months. This study has now enrolled over 9000 children across 41 sites in 10 countries. Anna has been invited to present preliminary findings from this study at multiple international conferences in 2021; this includes a Presidential Plenary Session at the Pediatric Academic Societies 2021 meeting, as well as at the ECCMID 2021 conference in Europe. She is completing multiple manuscripts on behalf of the study group related to this important research. The second study focuses on asymptomatic SARS-CoV-2 infection in children and related household transmission dynamics. This study has now started recruitment in 7 sites and enrolled 120 children.

Dr. Funk has 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. During this period, she has collaborated on multiple manuscripts, including a describing a novel diagnostic approach and the clinical characteristics of children presenting for emergency department care with isolated vomiting. She has also described the clinical epidemiology of adenoviruses infections in children and supervised resident research project that characterized publication bias in the pediatric probiotic literature.

Sarah Williamson-Urquhart

Determining Optimal Methods of Collecting Clinical Research Outcome Data from Patients and Families after Discharge from the Emergency Department.

Research performed in pediatric emergency departments is usually characterized by brief one-time, in-person interactions between the patient, their caregiver(s), and both the clinical team (nurses/physicians) and research team members. Study procedures (e.g. screening, consent, intervention) are performed while the patient is still in the emergency department however the remaining study data are obtained after the patient has left the emergency department. Research and safety outcomes in pediatric

emergency medicine often depend on patient/caregiver report obtained through remote follow-up performed after discharge. Patient follow-up periods are usually short and require ongoing communication via telephone, email, or text messaging to obtain this important data.

To determine the optimal method(s) for collecting data after discharge from the ED, Sarah is completing a review of published clinical data from the Pediatric Emergency Research Canada network and will descriptively analyze the modality used to collect follow-up outcome data in comparison with follow-up completion rates. Additional analyses will be performed to determine other factors, such as the number of questionnaires to be completed and the timeline of required follow-up (e.g. daily, weekly, annually), which may influence the completion rate after discharge.

Madison Riddell and Kaden Lam

Probiotic Publication Bias

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. However, publication bias or, the tendency for authors to submit and/or journals to accept manuscripts for publication based on the direction or the strength of the study findings, has the potential to distort the data available in the 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 compare the potential for publication bias related to the use of probiotics in children using commonly employed antibiotics as the referent standard. They found that registered probiotic trials are less likely to be published than antibiotic trials even after controlling for funding source, presence of blinding and study purpose. The results raise concerns regarding the interpretations and conclusions that may be drawn from meta-analyses of pediatric probiotic trials.



LEFT: Trainee Anne Funk
TOP RIGHT: Kaden Lam
BOTTOM RIGHT: Madison Riddell

PEM fellow's scholarly projects

Dr. Gloria Yoo

Accuracy of visual assessment in resuscitative ventilation: does point of view make a difference?

Pediatric cardiopulmonary arrest (CPA) is a significant but uncommon event. During pediatric CPA, effective and high-quality cardiopulmonary resuscitation (CPR) encompassing timely and adequate chest compressions (CC) and ventilation have been shown to improve survival to discharge. Given that pediatric CPA is more commonly associated with respiratory disease, adequate ventilation and oxygenation during resuscitative ventilation is a critical component of CPR and provides an opportunity to improve patient outcomes. Monitoring CPR quality to ensure high-quality CC through simulation-based education and feedback devices has been demonstrated, but fewer studies have looked at ventilation quality during in-hospital pediatric CPA resuscitation. Therefore, this study aims to determine the proportion of time, within a 6-minute simulated pediatric resuscitation recording, that health care providers can accurately identify ventilation rates that are in compliance with the 2020 AHA guidelines.

Dr. Omar Damji

VITAL – Virtual Reality for Intubation Training As a Lifesaving Measure

Medical training environments have been forced to change in light of work-hour restrictions in residency programs, greatly impacting trainees' ability to gain proficiency in procedural skills. Training environments (e.g. simulation), degree of realism of training units, and instructional design are key facets essential for procedural skill acquisition. Endotracheal Intubation (ETI) is a critical skill in adult/pediatric emergency medicine requiring proficiency. Simulator-based task training (SBTT) has provided a safe and effective method of skill acquisition. Mannequins are the mainstay of ETI practice; however they lack realism. Mixed reality (XR) may be an effective adjunct, creating a training environment with realistic parallels to clinical practice. VITAL XR is focused on creating the best simulated learning environment and platform for medical training. Our work bridges a gap between real-world medical challenges and technologies like virtual and augmented reality that can extend the capabilities of critical care training scenarios. This hybrid platform is intended to maximize practice opportunities for medical staff by reinforcing techniques and learning with a safe, simulated, yet realistic approach. Combining mixed reality to create



an immersive simulated environment with a new 3D printed mannequin respecting biomechanics, tissue properties and anatomy will ultimately help lend to realism. Machine learning will incorporate expert opinion allowing the teaching tool to not only provide immersive practice, but the ability to teach without the expert being there with the learner. Our platform aims to setup training simulations with ultra-realistic physical and digital components using artificial intelligence trained by expert practitioners to achieve deeper learning. Real-time guidance and correction via audio visual aids as well as tactile feedback will provide results driven simulation and practice opportunities. In critical care situations, when they are most desperately needed, the skills learned, refined, and practiced can be applied with expediency and confidence.

Dr. Grazyna Burek

To scan or not to scan? Development of a local consensus guideline at the Alberta Children's Hospital for the use of CT chest imaging in pediatric trauma.

Trauma is the leading cause of death in toddlers, children, adolescents, and young adults with an estimated 25% being attributed to chest trauma worldwide. Although pathologic intrathoracic injury from trauma is a rare occurrence, it poses a significant risk of morbidity and mortality. Differences in pediatric thoracic anatomy and physiology may pose a diagnostic dilemma in the setting of trauma leading to potential missed injuries, unnecessary radiation exposure and practice variation. We aim to create a consensus guideline to incorporate the best available evidence into clinical practice when deciding if CT imaging of the chest is needed in the setting of trauma. The aim of this framework is to derive a guideline to be implemented locally in our centre in an effort to reduce practice variation, improve resource utilization and prevent harm to pediatric patients presenting to the emergency department with trauma while not missing clinically significant intrathoracic injuries.



Partnerships & Collaborations

BIKE

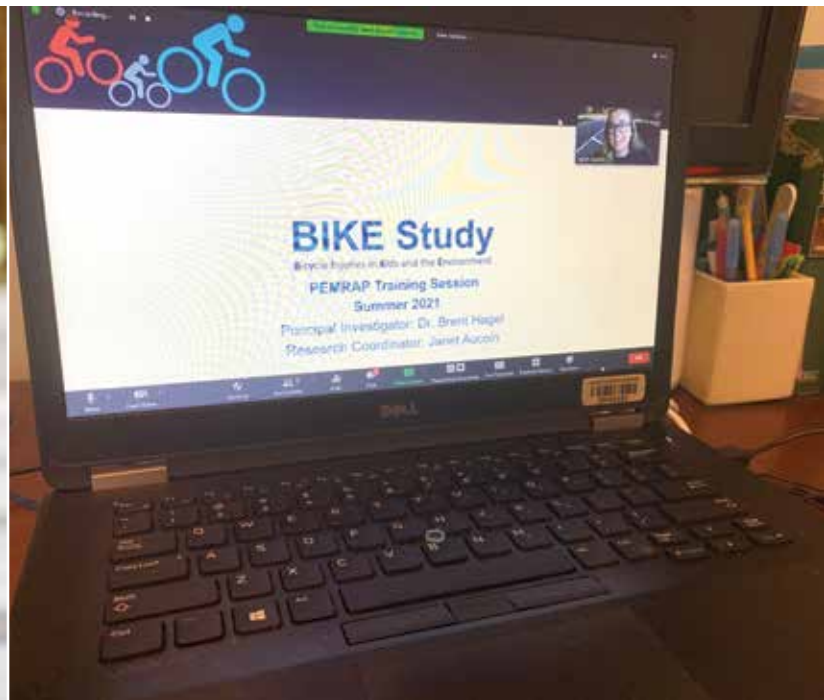
The BIKE (Bicycling Injuries in Kids and the Environment) study is a national CIHR funded study led by Dr. Brent Hagel (PhD epidemiologist, Department of Pediatrics, Cumming School of Medicine) which is looking at the determinants of bicycling injuries in children and adolescents. Every year in Canada, 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.

FLIC

The FLIC (Functional Light Imaging in Concussion) study is a prospective, longitudinal cohort study of adolescents aged 12 – 18 years led by Dr. Jeff Dunn (PhD, Department of Clinical Neurosciences, University of Calgary). By age 25, over 30% of Canadians are likely to have had a brain injury, with mTBI being the most common. Currently, there is no accepted imaging method to monitor mTBI. There is a critical need to understand the injuries, predict outcomes, detect treatment response and determine when to return to activity. Functional near-infrared spectroscopic measures of coherence as a new biomarker of injury in mTBI patients. This project will provide novel data on brain injury and show how functional near-infrared spectroscopy (fNIRS) could be useful for monitoring mTBI.

KOALA

KOALA (Kids' Outcomes and Long-term Abilities) study 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, one pediatric emergency department in the United States, 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.





Reporting

Publications

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Funding

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- Bernier F, Kellner JD. Co-Investigators: Esser M, **Thompson G (co-I)**, Fritzler M, Croxen M, Forkert N, Benseler S, Berenger B, Blackwood J, Bulman D, Cabaj J, Eaton A, Castillo E, Constantinescu C, Dean W, **Freedman SB (co-I)**, Gordon P, Hallgrimsson B, Hu J, Jirik F, Kannu P, Kuhn S, Lacaze T, Lamont R, Long Q, Marshall D, Melin A, Newton R, Parboosingh J, Pon R, Robinson J, Taylor S, Twilt M, Vomiero G, Vanderkooi O, van Marle G, Wang E. Alberta Children's Hospital Foundation. Alberta Childhood COVID-19 Cohort (AB3C) Study (Aim 1). **\$100,000**. June 1, 2020 – June 1, 2022.
- Bernier F, Kellner JD. Co-Investigators: Esser M, **Thompson G (co-I)**, Fritzler M, Croxen M, Forkert N, Benseler S, Berenger B, Blackwood J, Bulman D, Cabaj J, Eaton A, Castillo E, Constantinescu C, Dean W, **Freedman SB (co-I)**, Gordon P, Hallgrimsson B, Hu J, Jirik F, Kannu P, Kuhn S, Lacaze T, Lamont R, Long Q, Marshall D, Melin A, Newton R, Parboosingh J, Pon R, Robinson J, Taylor S, Twilt M, Vomiero G, Vanderkooi O, van Marle G, Wang E. MitogenDx (In-Kind Support). Alberta Childhood COVID-19 Cohort (AB3C) Study (Aim 2). **\$40,000**. June 1, 2020 – Dec 31, 2021.
- Bernier F, Kellner JD. Co-Investigators: Esser M, **Thompson G (co-I)**, Fritzler M, Croxen M, Forkert N, Benseler S, Berenger B, Blackwood J, Bulman D, Cabaj J, Eaton A, Castillo E, Constantinescu C, Dean W, **Freedman SB (co-I)**, Gordon P, Hallgrimsson B, Hu J, Jirik F, Kannu P, Kuhn S, Lacaze T, Lamont R, Long Q, Marshall D, Melin A, Newton R, Parboosingh J, Pon R, Robinson J, Taylor S, Twilt M, Vomiero G, Vanderkooi O, van Marle G, Wang E. Alberta Childhood COVID-19 Cohort (AB3C) Study (Aim 2). **\$250,000**. June 1, 2020 – Dec 31, 2021.
- Bernier F, Kellner JD. Co-Investigators: Esser M, **Thompson G (co-I)**, Fritzler M, Croxen M, Forkert N, Benseler S, Berenger B, Blackwood J, Bulman D, Cabaj J, Eaton A, Castillo E, Constantinescu C, Dean W, **Freedman SB (co-I)**, Gordon P, Hallgrimsson B, Hu J, Jirik F, Kannu P, Kuhn S, Lacaze T, Lamont R, Long Q, Marshall D, Melin A, Newton R, Parboosingh J, Pon R, Robinson J, Taylor S, Twilt M, Vomiero G, Vanderkooi O, van Marle G, Wang E. Genome Alberta. Alberta Childhood COVID-19 Cohort (AB3C) Study (Aim 2). **\$287,500**. June 1, 2020 – Dec 31, 2021.
- Bernier F, Kellner JD. Co-Investigators: Esser M, **Thompson G (co-I)**, Fritzler M, Croxen M, Forkert N, Benseler S, Berenger B, Blackwood J, Bulman D, Cabaj J, Eaton A, Castillo E, Constantinescu C, Dean W, **Freedman SB (co-I)**, Gordon P, Hallgrimsson B, Hu J, Jirik F, Kannu P, Kuhn S, Lacaze T, Lamont R, Long Q, Marshall D, Melin A, Newton R, Parboosingh J, Pon R, Robinson J, Taylor S, Twilt M, Vomiero G, Vanderkooi O, van Marle G, Wang E. Government of Alberta. Alberta Childhood COVID-19 Cohort (AB3C) Study (Aim 3). **\$650,306**. June 1, 2020 – June 1, 2022.
- Cheng A (PI)**. Canadian Institutes of Health Research – Project Grant, COVID-19 Initiative. Impact of Aerosol Box Use on Patterns of Contamination Healthcare Provider and Environmental Contamination during Aerosol Generating Medical Procedures: A Multicenter Study. **\$248,625**. May 1, 2021 – December 1, 2023.
- Cheng A (PI)**. International Network for Simulation-based Pediatric Innovation, Research and Education. Impact of Aerosol Box Use on Patterns of Contamination during AGMPs. **\$30,000** USD. February 1, 2021 – January 31, 2023.
- Cheng A (Senior-I)**. International Network for Simulation-based Pediatric Innovation, Research and Education. Patterns of Inattention Blindness during Cardiac Arrest Care: Do Healthcare Providers See and Correct Critical Errors? **\$10,000** USD. February 1, 2021 – January 31, 2023
- Eltorki M (PI), **Freedman SB (co-I)**. Hamilton Health Sciences New Investigator Fund. A Pilot Randomized Non-Inferiority Trial Of Ketorolac Vs. Morphine In Children With Suspected Appendicitis. **\$50,000**. July 1, 2020 – June 30, 2021
- Eltorki M, Pernica J, Sider D, Smieja M, El-Dakhakhni, **Freedman SB (co-I)**. AHSC AFP Innovation Fund – COVID-19. Detection of Asymptomatic SARS-CoV-2 in Children and Adults and Transmission Dynamics. **\$99,860**. June 1, 2020 – May 31, 2021.

12. **Freedman SB (PI)**, Berenger B, Funk A, Kellner J, Klassen T, Lee B, Mahmud S, Pang XL, Plint A, Salvadori M, Zelyas N, Zemek R. Canadian Institutes of Health Research Stream 1 of the Operating Grant: SARS-CoV-2 variants supplement: COVID-19 Rapid Research Funding Opportunity (461139). Clinical Characteristics of SARS-CoV-2 Variants of Concern in Symptomatic Children and an Assessment of Transmission from Asymptomatic Children. **\$49,932**. March 1, 2021 – February 28, 2022
13. **Freedman SB (PI)**, Florin T, **Funk A**, Kuppermann N, Berenger B, Mahmud S, Payne D, Kellner J, Malley R, Salvadori M, Klassen T, Neuman M, Tancredi D, Lee B, Pang XL. CIHR Operating Grant: COVID-19 Rapid Research Funding Opportunity – Social Policy and Public Health Response. Household Transmission Dynamics and Vial Load among Asymptomatic SARS-CoV-2 Infected Children. **\$591,800**. June 1, 2020 – May 31, 2021.
14. Giesbrecht G, van de Wouw M, Kim J, **Freedman SB (co-I)**, Tomfohr L, Lebel C. Department of Pediatrics 2020 Innovation Awards. Short-term effects of maternal SARS-CoV-2 infection during pregnancy on child neurodevelopment. **\$24,970**. May 1, 2021 – April 30, 2023.
15. **Johnson DW (co-I)**. 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 1, 2020 – June 30, 2021.
16. **Johnson DW (PI)**. 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. eMental Health for Youth and Young Adults. **\$100,000**. July 1, 2020 – June 30, 2023.
17. Orr S, Kirton A, Birnie K, **Freedman SB (co-I)**, Sajobi T. Canadian Institutes of Health Research (CIHR): Operating Grant: Early Career Investigator Grants in Maternal, Reproductive, Child & Youth Health. Changing the face of pediatric migraine: A phase 2a randomized controlled trial of a novel neuromodulation device for refractory acute migraine in children and adolescents. **\$105,000**. April 2, 2021 – May 30, 2024.
18. Poonai N (PI), Sukhera J, Doan Q, **Freedman SB (co-I)**, Matar A, Gaucher N, Zemek R, Fitzpatrick E, Sawyer S, Miller M. 2020 Children's Health Research Institute Internal Research Grant Competition. The Impact of Social Distancing on Mental Health Visits for Self-Harm in Canadian Youth During the COVID-19 Pandemic: A Population-Based Time-Series Analysis. **\$9,605**. September 1, 2020 – August 31, 2021.
18. **Thompson G (PI)**, Balamuth F, **Freedman SB (co-PI)**, Weiss S, Alnaji F, Cooke S, Gilad E, Kam A, Moretti M, Rochweg B, Verma N, Alqurashi W, Curtis S, Gripp K, Kissoon N, Murthy S, Sehgal A, Weiss M, Bertholet S, Davis A, Joffe A, Kuppermann N, Parker M, Shayan Y, Bradshaw M, Emsley J, Judge P, Mater A, Poonai N, Tucci M. Canadian Institutes of Health Research Project Grant (437372). Pragmatic Pediatric Trial of Balanced Versus Normal Saline Fluid in Sepsis (PRoMPT BOLUS). **\$1,503,226**. September 1, 2020 – August 31, 2025.
19. **Thompson G (PI)**, Brindle M (Co-Applicant), Forkert ND (Co-Applicant), Huston S (Co-Applicant), Jenne C (Co-Applicant), Kelly M (Co-Applicant), Kopciuk K (Co-Applicant), McCoy K (Co-Applicant), Mickiewicz B (Co-Applicant), Lau M (Co-Applicant). Department of Pediatrics Innovation Grant, University of Calgary Systemic and Local Immune landscape of Children presenting to the Emergency Department with suspected appendicitis (SLICED): Innovation through Multiplex Ion Beam Imaging. **\$25,000**. 2020 – 2022.



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28 Oki Drive NW, Calgary, Alberta T3B 6A8