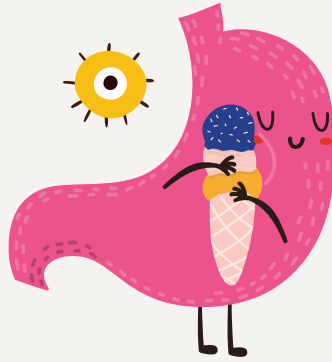




Alberta Children's Hospital  
ANNUAL REPORT 2018 (July 2017 to June 2018)

# 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.



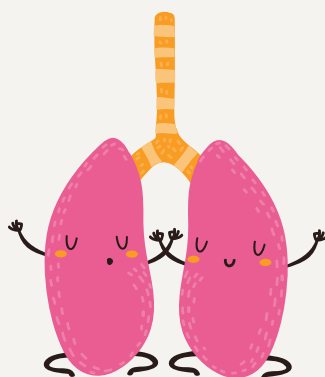


# Background



## SUMMARY

*Over the past 12 months the emergency department at the Alberta Children's Hospital (ACH) cared for over **77,000** ill and injured children. Children are cared for 24 hours a day, seven days a week. 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 resuscitation, precision medicine, quality improvement and simulation. In the past year we published **65** peer reviewed articles and publications and received substantial funding from local, national and international sources.*





YEAR IN REVIEW: JULY 1, 2017 – JUNE 30, 2018

## Clinical

EXCEPTIONAL CARE FOR OVER

77,000 children

PROVIDED BY A TEAM OF

63 physicians

AND OVER

200 nurses

## Research

THE RESEARCH TEAM ENROLLED OVER

900 patients

AND GENERATED

65 publications

WITH GRANT FUNDING TOTALING

\$4,242,114

*Principle Investigator (PI)/co-PI*

\$5,796,091

*Co-investigator/collaborator*

## Education

APPROXIMATELY

334 medical trainees

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

## Who we are

### PHYSICIANS:

**Angelo Mikrogianakis**

*Section Lead*

**Antonia Stang**

*Research Lead*

**Graham Thompson**

*Medical Director PEMRAP*

**David Johnson**

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

**Stephen Freedman**

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

**Jennifer Thull-Freedman**

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

**Adam Cheng**

*Simulation Research Lead*

**Kelly Millar**

*Education Lead*

**Vincent Grant**

*Simulation Medical Director*

**50+ Emergency Department Physicians**

### RESEARCH NURSES:

**Jen Crotts**

*(PEMRAP Lead)*

**Clare Howland**

**Jelena Komanchuk**

**Ruza Goulden**

**200+ Emergency Department nurses**



*Stephen Freedman and Gillian Tarr*

### COORDINATORS/RESEARCH ASSISTANTS:

**Karen Lowerison**

**Jianling Xie**

**Sarah Williamson-Urquhart**

**Kelly Kim**

**Rebecca Emerton**

**Kassi Shave**

**Ashley Jones**

**50+ Volunteer Research Assistants**

*(Pediatric Emergency Medicine Research Assistant  
Program PEMRAP)*

### RESEARCH TRAINEES

**Gillian Tarr**

*Eyes High Post-Doctoral Scholar*

**Thomas Kellner**

*Graduate Student*

**Chu Yang Lin**

*Graduate Student*

**Yiqun Lin**

*PhD Student*

### ADMINISTRATION:

**Julie Slinn**

**Shayla Baier**

**Gertrud VanDerMey**

**Mona Bechervaise**





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BACKGROUND | **HIGHLIGHTS** | PARTNERSHIPS/COLLABORATIONS | REPORTING

# Highlights





## Awards and Significant Achievements

### 1) *President's Excellence Awards*

*Through the collaborative, local improvement teams are empowered to implement changes and improve outcomes for children's procedural and presenting pain.*

#### COMMITMENT TO COMFORT



The Commitment to Comfort Quality Improvement Collaborative, led by **Dr. Jennifer Thull-Freedman**, addresses pain and distress for children in more than 50 emergency departments across

Alberta. Through the collaborative, local improvement teams are empowered to implement changes and improve outcomes for children's procedural and presenting pain. Over 40,000 visits have been analyzed to determine progress toward performance aims, and more than 1000 ED patients have completed surveys, resulting in generation of a "pain map" that informed ongoing strategies to reduce pain and distress. Resources produced for the project, including comfort kits (containing distraction items for kids), educational resources, posters, and a website, are tools that continue to be used in helping to support staff and engage families.



#### APPETITE

The Alberta Provincial Pediatric Enteric Infection Team (APPETITE), led by **Dr. Stephen Freedman**, is an internationally-recognized team striving to expand knowledge about the epidemiology of pediatric enteric infectious diseases by evaluating novel specimen sampling approaches and diagnostic techniques. APPETITE is a very large multi-disciplinary team co-led by Drs. Xiao-Li (Lilly) Pang, Linda Chui, Bonita Lee and Marie Louie with meaningful contributions from team members such as Dr. Gillian Currie who sits on multiple committees. This year APPETITE was the successful recipient of the 2018 AHS President's Excellence Award for Outstanding Achievement in Innovation and Research Excellence! This award is a culmination of the amazing work and dedication from every team member, trainee, partner, coordinator, program manager, administrative assistant, laboratory technician, as well as patients and families. For more information on the President's Excellence Awards, please go to <https://www.albertahealthservices.ca/info/presidentaward.aspx>.





*The Canadian Pediatric Society biennial Career Research Award recognizes the career of an outstanding and accomplished researcher working on an aspect of pediatric research in Canada.*

**2) 2018 Canadian Pediatric Society Career Research Award**

**Dr. David Johnson** is an internationally recognized expert in the management of children with acute respiratory distress including croup, bronchiolitis and asthma. He is a founding leader of Pediatric Emergency Research Canada (PERC), a clinical research network encompassing 15 Canadian pediatric emergency departments and over 200 investigators. Dr. Johnson currently has 144 peer-reviewed medical journal articles published or in press and has seen junior faculty he mentored go on to establish successful research careers at several children's hospitals including Alberta Children's Hospital, Stollery Children's Hospital, and the Children's Hospital of Eastern Ontario.

Dr. David Johnson is currently the Senior Medical Director for the Alberta Health Services Maternal, Neonatal, Child and Youth Strategic Clinical Network, a pediatric emergency physician and medical toxicologist, and a Professor of Pediatrics, Emergency Medicine, and Physiology and Pharmacology at the University of Calgary. His research interests are primarily focused on the management of common childhood respiratory emergencies and ensuring primary health care professionals utilize 'best evidence' in managing these diseases.

*The INSPIRE networks thrives by conducting collaborative, multicenter research using simulation as a tool to address clinically important questions pertaining to acute care, family centered care, procedural skills, and medical training.*

**3) 2017 Presidential Citation, Society for Simulation in Healthcare (INSPIRE Network)**

**Dr. Adam Cheng** was awarded a Presidential Citation from the Society for Simulation in Healthcare for his leadership of the International Network for Simulation-based Pediatric Innovation, Research and Education (INSPIRE). The Presidential Citation is the society's highest honor, awarded to individuals who have made outstanding career contributions to the field of healthcare simulation. As co-founder and co-chair of the INSPIRE network, Dr. Cheng has fostered the growth of a community of over 800 members from >200 institutions globally. The INSPIRE networks thrives by conducting collaborative, multicenter research using simulation as a tool to address clinically important questions pertaining to acute care, family centered care, procedural skills, and medical training.





## The Pediatric Emergency Medicine Research Associates Program (PEMRAP)

*"It has been another exciting year for the PEMRAP program! We continue to build our program in meaningful and long-lasting ways. In the last year we trained 55 new PEMRAP Research Assistants and said goodbye to others moving on to exciting careers in research and medicine. Our PERT/PEMRAP website is nearing completion and our new-student orientation and training processes are continually being honed and refined. Throughout the summer we will be training a newly hired PEMRAP support specialist and we will be working hard to develop new ideas that will continue to build and grow the program. Working with PEMRAP and building up the next generation of Researchers continues to be the greatest source of satisfaction in my career!"*

– Jennifer Crotts, PEMRAP Team Lead, RN

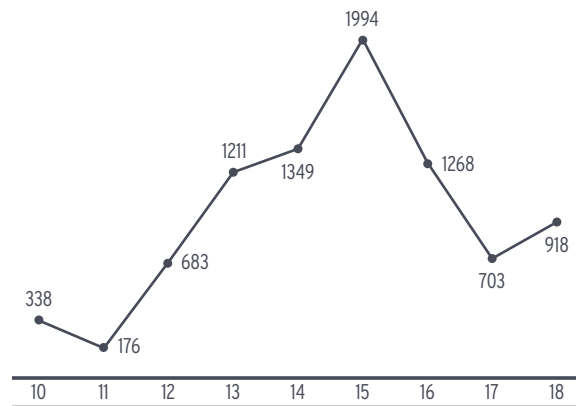
*"PEMRAP was an amazing opportunity to be exposed to clinical research, and primed my curiosity to pursue further research projects in Edmonton where I'm currently studying. Few research opportunities allow you to dabble in multiple projects at once, and this gave me a broader exposure to the variety of research questions that could be asked and answered. Learning about the process of consent, data collection, and follow-up helped me gain familiarity with how research is conducted first-hand and seamlessly integrated into ED flow. As I became a more experienced student, I was able to develop leadership skills through training new students during orientation sessions as well as on the job. It was a wonderful work environment and I loved my time spent with PEMRAP!"*

– Keon Ma, Former PEMRAP Student and current Medical Student at the University of Alberta





Research team enrollments per year



PEMRAP is a volunteer research associate program which has been in existence at the ACH ED since 2009. Over 300 students have participated in the program and had the opportunity to learn about research and interact with patients, families and the health care team.

## Canadian Institutes of Health Research (CIHR) Strategy for Patient-Oriented Research (SPOR)

*More than 50% of pediatric patients receiving medications are treated with at least one drug that is not approved for use in children.*

### **Innovative Pediatric Clinical Trials (iPCT) Initiative**

**Total funding = \$8,397,971**

More than 50% of pediatric patients receiving medications are treated with at least one drug that is not approved for use in children. Information related to dose, efficacy and safety is typically obtained from studies involving adults. The innovative Pediatric Clinical Trials (iPCT) initiative is designed to address these challenges and demonstrate that innovative approaches to pediatric trials will result in evidence for the safety and efficacy of medications in children that will have an immediate impact on clinical decision-making. The iPCT initiative is a collaboration between 7 Canadian hospitals, the Pediatric Emergency Research Canada (PERC) research network, SPOR Support Units, and KIDSCAN (Canadian advisory network which ensures best therapies for children). With funding from the Canadian government, support from ACHRI, and the 6 collaborating institutions, a total of nearly \$9 million is committed to conducting 4 clinical trials. The Pediatric Emergency Research Team (PERT) is leading 1 trial and will participate in the other 3.

### **The DOSE-AGE Study: Multi-DOSE Ondansetron for Pediatric Acute GastroEnteritis**

**Principal Investigator and ACH Site Lead:**  
**Dr. Stephen Freedman (Calgary, AB)**

A Randomized Controlled Trial to determine if the use of multiple doses of oral ondansetron, provided at Emergency Department (ED) discharge, will result in improved outcomes in children treated in an ED for vomiting secondary to acute gastroenteritis. The study will recruit children who present to a participating ED with vomiting. Caregivers will choose whether or not to administer doses of the medication provided during the 48 hours following ED discharge based on the child's ongoing symptoms. The primary outcome of this study will be selected by caregivers and patients based on which outcomes they would most like to see improved (e.g. duration, frequency of vomiting).

### **The INK Study: Intranasal Ketamine for Forearm Fracture Reduction**

**Principal Investigator: Dr. Naveen Poonai (London, ON)**  
**ACH Site Lead: Dr. Stephen Freedman**

A Randomized Controlled Trial of intranasal versus intravenous ketamine for procedural sedation in children with a forearm fracture requiring reduction. The primary outcome is to determine if intranasal ketamine is non-inferior to intravenous ketamine for adequate sedation for the duration of the procedure.

### **The NoOUCH Study: A Study of Non-Steroidal or Opioid Analgesia Use for Children with Musculoskeletal Injuries**

**Principal Investigator: Dr. Samina Ali (Edmonton, AB)**  
**ACH Site Lead: Dr. Antonia Stang**

A Randomized Controlled Trial of Non-steroidal Or Opioid Analgesia Use for Children with Suspected Fractures designed to determine the effectiveness and safety of a combination of oral analgesic medications (oral ibuprofen + oral acetaminophen; oral ibuprofen + oral hydromorphone; oral ibuprofen alone) for the acute pain management of children who present to the ED with a suspected limb fracture. This is a patient/caregiver preference trial where participants will select which branch of the trial they would like to enroll in (e.g. opioids or non-opioids).

### **The BIPED Study: Bronchiolitis in Infants Placebo vs. Dexamethasone**

**Principal Investigator: Dr. Amy Plint (Ottawa, ON)**  
**ACH Site Lead: Dr. Graham Thompson**

A Randomized Controlled Trial comparing epinephrine and dexamethasone to placebo in the treatment of infants with bronchiolitis, a respiratory illness in infants characterized by nasal congestion, coughing, wheezing and difficulty breathing. While there are many studies evaluating a variety of medications for the management of infants with bronchiolitis; current clinical guidelines promote supportive care. Based on findings from a previous PERC study, the objective of this current research is to determine whether children treated with a steroid (dexamethasone) plus a bronchodilator (epinephrine) are less likely to be admitted to hospital than children treated with placebo alone.





# Partnerships/Collaborations



## Partnerships and Collaborations

*The SQUEEZE trial is a being performed in the Emergency Department and Pediatric Intensive Care Units in multiple children's hospitals across Canada.*

The Pediatric Emergency Research Team (PERT) supports the work of collaborators from across the hospital, the University of Calgary, and the entire country. A sampling of current partnerships and collaborations includes:

- 1) **The SQUEEZE Trial** (A Trial to Determine Whether Septic Shock Reversal is Quicker in Pediatric Patients Randomized to an Early Goal Directed Fluid-Sparing Strategy vs Usual Care) is a CIHR funded national study led by Melissa Parker from McMaster University and ACH investigators Graham Thompson (Emergency Medicine) and Elaine Guilfoyle (Critical Care Medicine).

Children with severe infection (sepsis) are at risk of organ dysfunction, prolonged hospital admissions, long-term cognitive and physical disabilities and death. Some of these problems are caused, in part, by changes in blood flow in the body. Providing intravenous (IV) fluids to a child with sepsis is thought to improve blood flow. Current care of a child with sepsis includes large volumes of IV fluid, however too much fluid may also cause problems in the lungs and heart and brain.

The objective of the SQUEEZE trial is to find out whether children recover quicker when they are treated with a combination of smaller amounts of IV fluid plus the early use of medications that act to improve blood flow compared to those children that are treated with traditional large volumes of IV fluid. The results of this study will guide health care teams as they provide life-saving care to children with severe infection.

The SQUEEZE trial is a being performed in the Emergency Department and Pediatric Intensive Care Units in multiple children's hospitals across Canada. It is a Pediatric Emergency Research Canada and Canadian Critical Care Trials Group approved study.



- 2) **The BIKE (Bicycling Injuries in the Kids and the Environment)** study is a national CIHR funded study led by Brent Hagel 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.
- 3) The PERT team is recruiting patients into the **BAT (Blunt Abdominal Trauma)** study led by surgeons Natalie Yanchar and Steve Lopushinsky. The goal of this study is to collect data on blunt abdominal trauma in children to quantify the associations between ED findings/investigations and the likelihood of clinically significant intra-abdominal injury. The results of the study, which is currently being conducted at the ACH and in Halifax, will be used to design a multicentre, Canada-wide study that will collect sufficient data to develop a clinical decision rule to aid clinicians in deciding whether CT imaging of the abdomen is warranted (high likelihood of identifying clinically significant injury) in the assessment of BAT in children and youth.



# Reporting





## Publications

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13. Chen W, Cepoiu-Martin M, **Stang A**, Duncan D, Symonds C, Cooke L, Pringsheim T. Antipsychotic Prescribing and Safety Monitoring Practices in Children and Youth: A Population Based Study in Alberta, Canada. *Clin Drug Investig*. 2018 Feb 16. doi: 10.1007/s40261-018-0626-4. [Epub ahead of print].
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## Funding

1. Ali S (PI), Hartling L, **Stang A**, Suranyi Y, Ma K, Scott S, Wright B, Westerlund C. The Family Needs Survey. Women and Children's Research Institute Innovation Grant. **\$20,000**. 2018-2019.
2. Arrieta MC (PI), **Freedman SB (co-PI)**. 2018 Respiratory Health Strategic Clinical Network Research and Innovation Seed Grant. Infant gut microbiome changes in asthma development – The ANTIBIO Study. **\$10,000**. April 1, 2018 – March 31, 2019.
3. Arrieta MC (PI), **Freedman SB (co-PI)**. Alberta Children's Hospital Research Institute, Healthy Outcomes Theme, Collaborative Research Initiative Grant. The ANTIBIO Study: The Effect of Antibiotics on the Infant Fungal Gut Microbiome. **\$12,500**. January 1, 2018 – December 31, 2018.
4. **Cheng A**, Lin Y, Gilfoyle E, Caird J, Grant V. Patterns of Inattentional Blindness during Cardiac Arrest Care: Do Healthcare Providers See and Correct Critical Errors? *Alberta Children's Hospital Research Institute and The Office of the Associate Dean of Research, Enhanced Bridge Funding Program, Cumming School of Medicine*. **\$25,000**. 2018 – 2019.
5. **Cheng A**, Lin Y, Gilfoyle E, Grant V. Improving Cardiac Arrest Outcomes with Resuscitation Research (iCORE): Exploring the role of data-informed debriefing, digital charting, and situational awareness. *Alberta Children's Hospital Research Institute and the Alberta Children's Hospital Foundation*. **\$346,000**. 2017 – 2020.
6. **Cheng A**, Lin Y. Improving Cardiac Arrest Outcomes with CPR Coaching. *Alberta Children's Hospital Research Institute and The Office of the Associate Dean of Research, Enhanced Bridge Funding Program, Cumming School of Medicine*. **\$20,000**. 2017 – 2018.
7. Clark M, Hecker K, **Cheng A**, Kirton A. Does the use of non-invasive brain stimulation enhance surgical skill acquisition and retention? *Department of Surgery Research Grant, University of Calgary*. **\$31,575**. 2017 – 2020.
8. Cooke L (PI), Burak K, **Stang A**, Duncan D, Rivera L, Armson H. Title: Audit and Group Feedback: What works for whom and in which context: A realist evaluation of the Calgary Physician Learning Program. OHMES Health Science and Medical Education Research and Innovation Funding Competition. **\$10,000**. 2018-2019.
9. Dalziel, S(PI), **Johnson**. New Zealand Health Research Council Program Grant. Prevention of Asthma. **NZ\$4,993,728**. Jul 2017-Jun 2028.
10. **Freedman SB (co-PI)**, Brady-Fryer B, McLane P, **Mikrogianakis A**, Stubbs M, Wright B, Chan K, Klassen T, MacMaster F, Newton M (co-PI), Parrilla Lopez M, Rittenbach K, Taljaard M, Wright B, Ali S, Graham T, McCabe C, Bercov M, Hensel J, Sareen J, Bolton J, Jagodzinsky D, **Stang A**, Dimitropoulos G, Katz L, **Thull-Freedman J**. Implementing Innovative Models of Acute Pediatric Mental Health and Addiction Care. Operating Grant: SPOR iCT Rewarding Success - Development Grants – Alberta. **\$99,999**. April 1, 2018 – March 31, 2019.
11. **Freedman SB (co-PI)**, **Tarr G (co-PI)**, Chui L, Hagel B, Hinshaw D, Lee B, Pang X, Simmonds K. 2018 Maternal Newborn Child & Youth Strategic Clinical Network™ Seed Grant Competition. Estimating the Burden of Viral Acute Gastroenteritis in Alberta's Children. **\$15,000**. April 1, 2018 – March 31, 2020.
12. **Freedman SB (co-PI)**, **Tarr G (co-PI)**, Lorenzetti D, Chui L, Lin C, Tarr P, Hartling L. 2018 Emergency Strategic Clinical Network (ESCN) Systematic Review Grant competition. Performance of Commercial Molecular Tests for Rapid Detection of Shiga Toxin-producing Escherichia coli (STEC): A Systematic Review and Meta-analysis. **\$14,750**. May 1, 2018 – April 30, 2019.
13. **Freedman SB (PI)**, Brady-Fryer B, McLane P, Mikrogianakis A, Stubbs M, Wright B, Chan K, Klassen T, MacMaster F, Newton M (co-PI), Parrilla Lopez M, Rittenbach K, Taljaard M. Canadian Institutes of Health Research Operating Grant - SPOR iCT Rewarding Success; Funding Reference #: TA1-155584. Implementing Innovative Models of Acute Pediatric Mental Health and Addiction Care. **\$2,484**. January 1, 2018 – March 31, 2018.



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15. **Grant V**, Haws J, Boscan A, Lin Y, **Cheng A**. Measuring the cognitive load of novice and expert facilitators during the debriefing phase of a clinical simulation. *Office of Health and Medical Education Scholarship Research and Innovation Fund, University of Calgary*. **\$7,780**. 2018- 2020.
16. **Grant V (co-PI)**, Lin Y, Gilfoyle E, Caird J, **Cheng A**. Patterns of Inattentional Blindness during Cardiac Arrest Care: Do Healthcare Providers See and Correct Critical Errors? *Department of Pediatrics Innovation Award, University of Calgary*. **\$25,000**. 2018 - 2019.
17. Grimshaw J, Levinson, W, Sikorski, T, Bhatia S, **Dowling S (co-PI)**, Hall A, Parfrey P, Pressau J, Taljaard M. De-implementing low value care: a research program of the Choosing Wisely Canada Implementation Research Network. CIHR Operating Grant: SPOR Innovative Clinical Trial Multi-Year Grant. **\$1,500,000 (\$1,500,000 matching)**. April 2018 - March 2022.
18. Hecker K, Lin Y, Kirton A, **Cheng A**. The Health Education Neuroassessment Laboratory (THENaL). *John R Evans Leaders Fund, Canada Foundation for Innovation*. **\$380,000**. 2017-2020.
19. **Johnson, D. (PI)**. CIHR Project Grant. High-dose corticosteroid treatment of term infants: assessment of long-term neurodevelopmental effects. **\$642,600**. April 2018 - March 2021.
20. Long L (PI), **Stang A, Dowling S**, Bailey MJA, Andrews C, Lu LS, **McFetridge A**, Koot D, Seefried B. Joining Forces to Improve Acute Bronchiolitis Care at the Alberta Children's Hospital: An ED and Inpatient QI Collaborative. Chief Medical Officer (CMO)/Calgary Zone Medical Affairs (MA) Quality Improvement Initiative. **\$21, 538**. 2018-2019.
21. Santana, M. Nominated PI, **Johnson, D. (PI)**, Noseworthy, M. University of Calgary, Department of Pediatrics Innovation Award. Integration of patient-reported outcomes in pediatric care: the KidsPRO. **\$24,250**. April 2018 - March 2019.
22. **Thomson, Benjamin (PI); Thull-Freedman, Jennifer**; Page, Stephen; Ferri de Barros, Fabio. Creating a Multi-Disciplinary Shared Decision-Making Pathway for Pediatric Low-Risk Fractures. *Calgary Zone Quality Council*. **\$22,000**. **2017-2018**.
23. Tijssen J, DeCaen A, Bhanji F, **Cheng A**, Morrison L. Analysis of variable contributing to bystander CPR rates in out-of-hospital cardiac arrest. *Heart and Stroke Foundation of Canada*. **\$40,000**. 2017-2019.

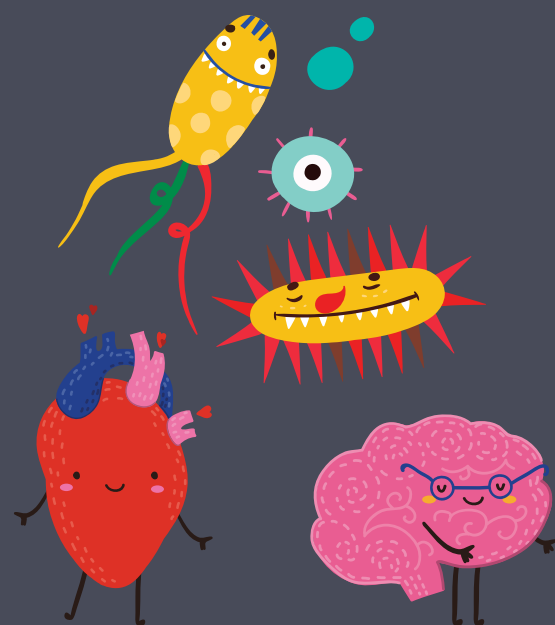


# Thank you!



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