

Vancouver General Hospital

VGH Emergency Medicine Research Newsletter

Over the last year...

*The Emergency
Department Research
Division has completed
another productive year!*

	New CIHR Grants	8
	Publications in peer reviewed journals	45
	Presentations	35
	Research Assistants & Student Volunteers	24

Congratulations to our Researchers

Brubacher JR, Chan H. Monitoring and Preventing Drug-Impaired Driving in Canada. Health Canada (Substance Use and Addictions Program – SUAP) \$1,361,356. Mar 2019.

Brubacher JR, Evans D, Brussoni M, Bryan S, Chan H, Erdelyi S, Lund A, Harris D, Staples J. Predictors of poor health and functional recovery following road trauma: An emergency department inception cohort study. CIHR \$875,925. Jan 2018.

Staples J, **Brubacher JR**, Chakrabarti S, Chan H, Erdelyi S, Hawkins N, Krahn A. Motor vehicle crash risk after cardioverter-defibrillator implantation: A population-based evaluation. CIHR \$180,000. Jan 2019.

Hohl CM, Grafstein E, Moneo M, Partovi N, Trimble J, Balka E, et al. Implementing and Evaluating Action ADE to Transform Medication Safety. CIHR Operating Grant: SPOR iCT Rewarding Success: Travel Award & Development Grants \$102,500. Mar 2018.

Hohl CM, Buxton J, **Purssell RA**, **Moe J**, Curran J, Tyndall M, **Godwin J**, Kendall P. Systematic Review of Naloxone Interventions in Opioid Overdoses. CIHR, Operating Grant: Opioid Crisis Knowledge Synthesis \$110,000. Apr 2018.

Moe J, **Hohl CM**, Grafstein E, Holroyd B, Schull M, Dong K, McGrail K, McGregor M. Identifying Risk and Transitions Among Frequent Emergency Department Users: Whose Needs Can Safely Be Met Elsewhere? CAEP Operating Grant \$5,000. Jan 2018.

Moe J, **Hohl CM**, Grafstein E, Holroyd B, Schull M, Dong K, McGrail K, McGregor M. Identifying Risk and Transitions Among Frequent ED Users: Whose Needs Can Safely Be Met Elsewhere? CIHR \$70,000. Feb 2018.

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Dr. Heather Lindsay
Department Head
Emergency Medicine

***Our Principal
Investigators
attracted \$4,328,097
in new grant
funding***

Congratulations Continued...

Moe J, Hohl CM. Identifying Subgroups and Risk Among Frequent Emergency Department Users: Whose needs can safely be met elsewhere? CAEP Operating Grant \$5,000. Feb 2018.

Moe J. Identifying Subgroups and Risk Among Frequent Emergency Department Users: Whose needs can safely be met elsewhere?. CIHR Starting Investigators Workshop Travel Bursaries \$1,500. Apr 2018.

Moe J, Hohl CM, McGrail K, Grafstein E, Schull M, Holroyd B, Dong K, McGregor M. VCHRI Innovation and Translational Research Award \$150,000. July 2018.

Ho K. TEC4Home Health Professional Investigator Program Award. Michael Smith Foundation for Health Research \$270,000. June 2017.

Ho K. Novak Lauscher H, Stacy E. Inter-Cultural Online health Network (iCON): engaging multicultural communities in B.C. BC Ministry of Health, Patients as Partners \$675,000. Apr 2018.

Ho K, Novak Lauscher H. Codi: Virtual Care Evaluation. Rural Coordination Centre of BC \$40,000. Oct 2018.

Ho K. Emergency Department App. Vancouver Coastal Health Research Institute (VCHRI) Innovator's challenge \$33,298. Apr 2018.

Servati P, **Ho K**, Lee A, Dumont G, Madden J, Van der Loos M, et. al. SmarT Innovations for Technology Connected Health (STITCH). UBC- Grants for Catalyzing Research Clusters (GCRC) \$100,000. Jan 2018.

Amed S, **Ho K**, Görges M. The Live 5-2-1-0 eHealth App - Supporting health professionals and educators to raise a healthier generation of kids. CIHR- Personalized Health Catalyst Grant \$99,935. Jan 2018.

Ho K, Partovi N, Tsao N, Wu B, Dahri K, Shaske J, Au C, Cordeiro J. TEC4Home: Medications Vigilance and Protection. Boehringer Ingelheim \$75,250. May 2018.

Buxton J, **Pursell RA**, Janjua N, Balshaw R, Dart R, Gomes T, Jozaghi E, Kuo M, Otterstater M. Opioid Prescribing Evaluation and Research Activities (OPERA). CIHR \$173,333.00. Mar 2018.

Research Projects

Adverse Drug Events: Adverse drug events cause 1 in 9 emergency department visits to acute care hospitals. Of these, over 30% are repeat adverse drug events that are due to unintentional re-exposure to medications that previously caused harm. We believe that many of these would be avoidable with better communication of information about these events across the patients' circle of care.

Over the past year, we have pilot-tested and refined a software, called ActionADE, that will allow pharmacists and physicians to record adverse drug events in a user-friendly manner. We are actively collaborating with Vancouver Coastal Health and the Ministry of Health to develop and launch a randomized control trial, in which information about adverse drug events will be communicated from ActionADE to the patients' PharmaNet profile. From there the information will be visible to community pharmacists, and other physicians who view the patients' PharmaNet profile. The randomized trial will allow us to assess the impact of this intervention on health outcomes.

Improving Care for ED Patients with Substance Use: Dr. Moe and her research team completed a systematic review on naloxone dosing in undifferentiated opioid



Dr. Jeff Brubacher
VGHEM Research
Director

Research Projects Continued...

overdoses and overdoses due to ultra-potent opioids. They found that higher initial naloxone doses, and in some cases, higher cumulative naloxone doses are being used to reverse toxicity due to fentanyl and ultra-potent opioids compared to heroin and other opioids. They are currently creating a linked database using information from multiple databases across B.C. - Take Home Naloxone, Mobile Medical Unit, InSite safe injection site, Emergency Health Services/Ambulance, VGH and St. Paul's Emergency Department - to better evaluate the optimal naloxone dose in ultra-potent opioid overdoses. Their collaborators at the BC Centre for Disease Control will use the study findings to inform dosing available in Take-Home Naloxone kits distributed widely across B.C.

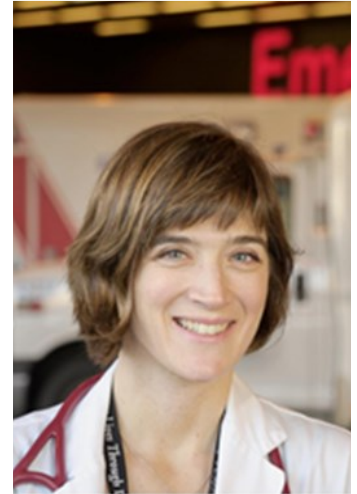
Dr. Moe created a database of all 8 million emergency department visits that occurred in B.C. between 2012-2016, linked to multiple additional databases including admissions data, outpatient visits, PharmaNet, and mortality data. She will be evaluating predictors of mortality and adverse outcomes among the top 10% of frequent ED presenters for all reasons, and the top 10% of frequent ED presenters with substance use and opioid use in B.C. Dr. Moe also created a similar database using national ED data from the Canadian Institute for Health Information. She will be using this data to identify high risk patients who could be flagged at the time of their ED visits for preventive intervention that could prevent outcomes like overdose or death.

Dr. Moe and her multi-disciplinary team have initiated a feasibility study to evaluate take-home buprenorphine/naloxone (Suboxone) at standard dosing compared to micro-dosing in the VGH ED. They will be enrolling patients in the summer of 2019 to evaluate the uptake and acceptability of the intervention. This feasibility study will be used to leverage funding for a definitive trial evaluating ED-initiated buprenorphine/naloxone at standard dosing compared to micro-dosing in the ED setting.

ED Ultrasound Research: Our ED ultrasound group consisting of Dr Dan Kim and his group of ultrasound fellows are involved in several interesting studies evaluating novel uses of ultrasound.

ED Assessment of Right Ventricular Function and Size in the Post Cardiac Arrest Patient: The right ventricle (RV) can yield important diagnostic clues that can aid the clinician, particularly in cases where one may suspect elevated right sided pressures, such as those due to pulmonary embolism. Classic teaching associates a dilated RV with pulmonary embolism, but this is only known to be the case in patients with spontaneous circulation. There is a paucity of literature about the appearance of the RV in the patient in acute cardiac arrest. Recent animal data suggests that RV dilatation occurs in a porcine induced cardiac arrest model, regardless of the etiology of the arrest. Dr. Dan Kim is involved in a multi-center study led by Dr. Tom Jelic at Health Sciences Centre Winnipeg to assess the RV function and size in patients who are immediately post cardiac arrest. The study hypothesizes that RV dysfunction and dilatation will be prevalent in this population, irrespective of the etiology of their arrest.

Accuracy of Physical Examination to Determine the Location of the Ankle Physis in Healthy Children: Presumed diagnosis of Salter-Harris I distal fibula fractures is suggested by clinical examination. However, it can be difficult to determine the precise location of the ankle growth plate by physical examination. This study, led by ultrasound fellow Veronique Dion, aims to establish the reliability of physical examination done by pediatric emergency physicians in determining the distal fibular growth plate

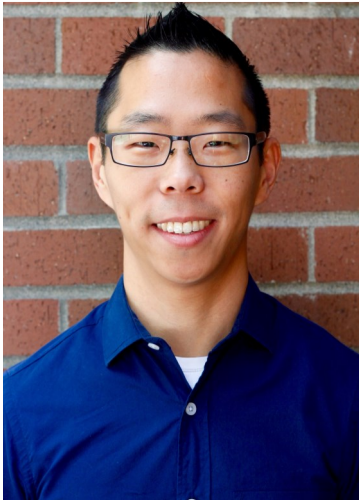


Dr. Corinne Hohl
Adverse Drug Events

*Three of our
investigators hold
Health Professional
Investigators Awards
from the Michael Smith
Foundation for Health
Research.*



Dr. Jessica Moe
Opioid Research



Dr. Dan Kim
Ultrasound Teaching & Research

*Dr. Jennifer Chao
received a CAEP Research
grant for her project "Low
Dose Intravenous
Ketorolac in Renal Colic: A
Pilot Study to Plan a
Randomized Controlled
Trial"*



Dr. Kendall Ho
TEC4Home &
eHealth Research

Research Projects Continued...

position, as compared to ultrasound (as a gold standard) by measuring the distance between both positions. This study hypothesizes that clinicians are not accurate at determining the exact position of the ankle physis on physical examination. If this hypothesis is correct, it would challenge the dogma that the diagnosis of a Salter-Harris I fracture can be made by clinical examination, or that it has clinical importance.

Point of Care Ultrasound Compared with Gonioscopy in the Evaluation of Patients with Narrow Angles: A Prospective Pilot Study: This prospective descriptive study led by EM resident Jen Chao will compare measurements of the anterior chamber using point of care ultrasound (POCUS) with gonioscopy for the identification of narrow angles in primary angle closure glaucoma. This study hypothesizes that POCUS will provide similar measurements of anterior chamber depth and anterior chamber angle to gonioscopy. If this is the case, POCUS could become a useful option as a screening tool for primary angle closure glaucoma.

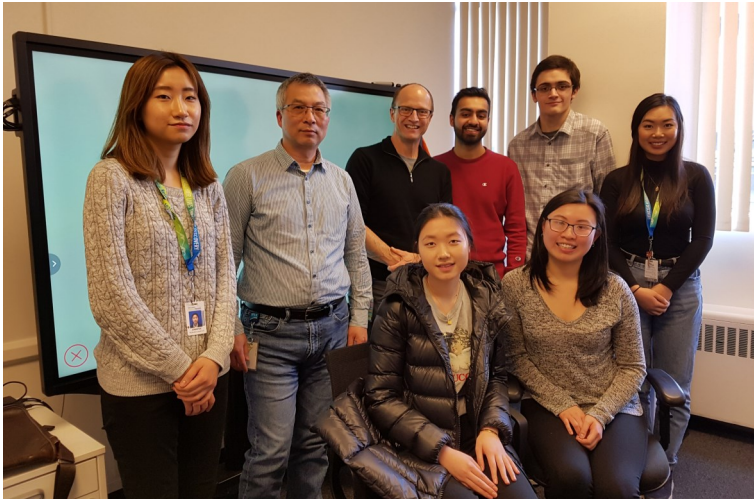
Development of a Machine Learning Algorithm for Focused Assessment with Sonography in Trauma Ultrasound Scans: The aim of this project, led by EM resident and ultrasound fellow Thomas Merth, is to develop an imaging information intelligence platform to facilitate the acquisition and interpretation of Focused Assessment with Sonography in Trauma (FAST) bedside ultrasound scans. FAST scans completed and saved for review as part of ultrasound education for the UBC ultrasound fellowship program will be labelled for anatomy and pathology. An artificial intelligence platform will be developed that will ultimately recognize anatomy and pathology in real time as FAST scans are completed. If validated, this tool would accurately inform sonographers obtaining FAST images in real time about the quality of their scan, and provide a computer assisted interpretation of the scan.

TEC4Home: A Trial to Evaluate How Home Health Monitoring Can Support Patients with Heart Failure: Led by Dr Kendall Ho, TEC4Home Heart Failure was launched in August 2018. This is a randomized controlled trial evaluating how Home Health Monitoring (HHM) can support the safety and quality of care during a patient's transition from hospital to home. Patients presenting to the hospital due to Heart Failure (HF) are currently being recruited for the study at 20 hospital sites across Vancouver Coastal Health, Fraser Health, Interior Health, and Providence Health.

Road Safety Research Group updates: The CIHR funded study of crash risk following an ED visit for syncope led by Dr. Staples is under way. Driver records and health data are linked and analysis will begin soon. Dr. Staples received a CIHR grant for another new study investigating risk of motor vehicle crashes following insertion of an implantable cardioverter-defibrillator. This study will analyze a cohort of 7000 patients who received the implant between 1997 and 2017 by linking health data and driving records.

The cannabis and motor vehicle crash project led by Dr. Brubacher has entered into its 8th year of data collection in BC with funding from two CIHR grants. Toxicology analysis of over 4500 BC injured drivers has been done. The results of the culpability analysis on the association between acute cannabis use and risk of crash using data from the first 3000 drivers was submitted for publication and is currently under review.

Research Projects Continued...



Road Safety Research: Jennifer Park, Herbert Chan, Jeff Brubacher, Anmol Sangha, Sasha Mohsenian, Rebecka Lee, Jocelyn Cheng, Leona Shum



Dr. Jennifer Chao
EM Resident

With the funding from the provincial governments of Alberta, Saskatchewan and Ontario, the study of demographic and regional variation in drug use among injured drivers treated in an ED after a crash has collected pre-cannabis legalization data on about 950 injured drivers from these 3 provinces. Together with data from BC, the interim analysis indicated a marked regional variation in prevalence of drivers tested positive for THC (9 to 23%), alcohol (13 to 24%), sedating medications (20 to 22%) and recreational drugs (8 to 11%) in these 4 provinces. Dr. Brubacher recently received a Health Canada grant to expand this drug driving project to cover all regions of Canada. In total 15 hospitals will participate in this study (BC, 4 sites; Alberta, 2 sites; Saskatchewan, 2 sites; Manitoba 1 site; Ontario, 2 sites; Quebec 2 sites; Nova Scotia, 1 site and Newfoundland, 1 site).

The Road Trauma Outcome Study is a CIHR funded inception cohort study conducted in three BC hospitals: Vancouver General Hospital, Royal Columbian Hospital, and Kelowna General Hospital. This multi-centered study, led by Dr. Jeff Brubacher, will identify risk factors for a poor outcome following road trauma among drivers, passengers, pedestrians, and cyclists. This study will also estimate health care costs and lost productivity for all road users. Data for this study comes from interviews with individuals who present to the ED within 24 hours following road trauma. Initial interviews shortly after the accident will determine pre-existing health status and other potential risk factors for a poor outcome. Follow-up interviews conducted at 2, 4, 6, and 12-months post ED visit are used to determine health outcome, functional recovery, health care costs, and lost productivity. Participants are enrolled in the ED and hospital wards. The aim of the study is to provide health care providers and policy makers with evidence they can use to improve health outcome for all road users following road trauma. The team has enrolled over 350 participants since July 2018.

ED Opioid Overdose Treatment Study: Drs. Roy Pursell and Jesse Godwin have initiated a retrospective cohort study funded by the MSFHR to evaluate the safety and efficacy of different naloxone dosing regimens. Health records of patients treated for opioid overdose (OD) in the EDs of seven urban hospitals from Jan 1, 2014 to Dec 31, 2017 are being reviewed. The study compares the proportion of patients who have ade-

Dr. Kendall Ho and his team are working to “Connect People to Better Health” using health information technologies



Sophie Kitchen
Master's student
ADE Research Group

Research Projects Continued...



Dr. Roy Purssell
Road Safety &
Toxicology

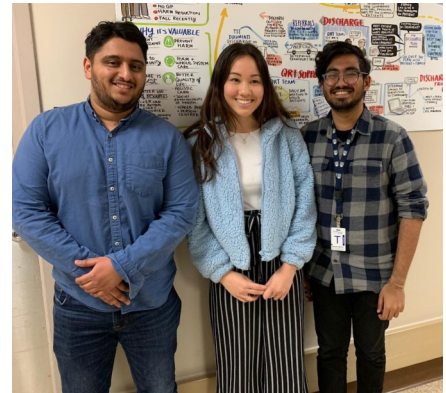
Our research office, located in the midst of a busy emergency department, has been a crucial part of our team's success over the last 20 years.



Maeve Wickham
PhD Student
ADE Research Group

quate reversal within 30 minutes and the proportion of those that develop precipitated opioid withdrawal syndrome when treated with a low-initial-dose (≤ 0.15 mg) naloxone vs. high-initial-dose (> 0.15 mg) naloxone regimen. British Columbia is in the midst of a public health emergency. There have been over 1400 illicit drug OD deaths in 2017, the majority of which involve the opioid, fentanyl. The optimal management of ODs of ultrapotent opioids (such as fentanyl) is complex and currently unclear in literature. The results of this study will help to refine treatment guidelines and could lead to improved patient outcomes.

Traumatic Brain Injury: "CAN-TBI: A National Biobank & Database for Patients with Traumatic Brain Injury" is a study running in multiple hospitals across Canada. In British Columbia, Vancouver General Hospital is the primary recruiting site for adult patients, led by Drs. William Panenka (Psychiatry – UBC) and Jeffrey Brubacher (Emergency Medicine – VGH). This Brain Canada funded research platform aims to integrate a translational biology approach with the collection of clinical, demographic, and outcome data from patients who have suffered acute mild, moderate, or severe traumatic brain injuries (TBIs). Small samples of blood are collected within 24 hours of injury for every participant, with additional samples collected for those admitted; these samples will be banked and used to study biomarkers that could help predict diagnosis and outcome, or tailor new therapies, support services, and rehabilitation strategies for TBI patients. Working closely with the clinical staff in the ED and ICU at VGH and BCCH, and in conjunction with the BC Children's Biobank, our study team has enrolled over 250 patients in BC since September 2016. Participant recruitment will conclude this year.



CAN-TBI Team: Imad, Lexynn, Hires

VGH Airway Registry: Although endotracheal intubation is performed frequently in our ED and throughout VGH, there is currently no system in place to track why and how patients are intubated, and by whom. Several studies describe the performance of intubation in EDs across North America, the UK, and Australia. However, there is no data published regarding the success rates or complications within the VGH model of emergency management, or any other centre across Canada. This project, led by Drs. Jan Trojanowski, Jeff Yoo, Colby Renschler & Jeff Brubacher has developed an airway registry at VGH and SPH that allows us to monitor and describe emergency airway management indications, methods used, operator characteristics, and adverse event rates. This information will be used to identify system and operator factors that are associated with adverse outcomes thereby providing insight into how patient safety can be improved during emergency airway management. Furthermore, it will allow us to monitor whether the implementation of departmental changes, such as an airway checklist and banding program, improves patient outcomes during intubation. The VGH Airway Registry has been collecting data on all intubations occurring in the ED, ICU, and wards since July 2016. SPH and MSJH joined in January 2018 and the collective registry is known as the British Columbia Airway Registry for Emergencies (BCARE). Upcoming projects include expansion to other sites and a

Research Projects Continued...

study evaluating the effects of a pre-intubation checklist on intubation success and safety metrics.

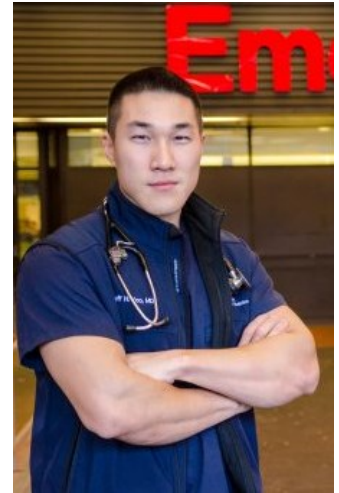
Chronic prescription opioid therapy associated with injection drug use: A large population based cohort study: British Columbia is experiencing an epidemic of overdose deaths mostly related to illicitly manufactured opioids. Initiation of injection drug use (IDU) is associated with a higher risk of overdose and other negative outcomes. The role of prescription opioids (PO) in the current illicit overdose epidemic is being debated and little is known about the transition from PO use to IDU. Dr. Roy Pursell has initiated a cohort study to evaluate the relationship between chronic PO use and initiation of IDU.

The Evaluating the Efficacy of E-Cigarette use for Smoking Cessation (E3) Trial: Smoking-related diseases contribute to the death of more than 37,000 Canadians annually. Of that number, almost one-third die of cardiovascular-related causes. Smoking cessation can decrease the additional risk of heart disease by 50% after one year of abstinence. However, e-cigarettes have not been approved for use for smoking cessation by Health Canada or the US Food and Drug Administration. Despite this, these devices are rising in popularity. The E3 Trial will be the first conducted in the general population of Canadian smokers motivated to quit. This multi-centre, randomized controlled trial (RCT) led by Dr. Ka Wai Cheung seeks to assess the efficacy, safety, and tolerability of nicotine and non-nicotine electronic cigarettes (e-cigarettes) for smoking cessation in the general population.

Low Dose Intravenous Ketorolac in Renal Colic: Renal colic due to nephrolithiasis is a common presentation to the ED. There is good evidence that NSAIDs are at least as effective as opioids for pain control in renal colic, and are therefore considered first line analgesics for renal colic. Among NSAIDs, ketorolac is preferred because it can be administered intravenously, and patients presenting with renal colic are often unable to tolerate oral intake. However, NSAIDs may increase the risk of renal impairment. There are several studies that have shown that lower doses of IV ketorolac, which may be associated with a lower risk of causing renal impairment, may have similar analgesic efficacy than the standard 30 mg dose. However, most studies enrolled patients with postoperative or cancer pain, and few presenting to emergency departments. EM resident Dr. Jennifer Chao has launched a pilot study to plan a randomized controlled trial. This project aims to determine whether low-dose IV ketorolac (10 mg) is non-inferior to standard dose (30mg) in providing analgesia for ED patients with suspected renal colic.

Research Education

Dr. Riyad Abu-Laban, UBC Department of EM Research Director, led the highly successful 8th annual "NERD Block" (Novel Education in Research & Design) for 12 Royal College EM Residents and 2 Peds EM Fellows in the fall of 2018. This 1 month program involves 34 interactive small group sessions and workshops facilitated by faculty members from the Department of Emergency Medicine and Division of Pediatric Emergency Medicine on all aspects of research and critical appraisal. NERD participants gain foundational knowledge, interact with and learn about the research being done by a wide range of Emergency Medicine faculty members, and develop and advance their own research projects. Since its onset, the NERD Block has been delivered to over 100 participants and gained wide attention, both across UBC and nationally. The next NERD



Dr. Jeff Yoo
Airway Registry

*Dr Moe and Dr Pursell
conduct research that
aims to prevent opiate
overdose and improve
the care of those who do
overdose*



Dr. Donna Lee
Ultrasound Education

Research Education Continued...

Block will run from September 23 to October 18, 2019. Any VGH EPs interested in participating are encouraged to contact Dr. Abu-Laban for further information.



Dr. Riyadh Abu-Laban
Research Education

*Dr Brubacher's
national study of drug-
impaired driving will
include 15 trauma
centres from Victoria,
BC to St John's
Newfoundland*



Nerd Family 2018

Publications

- ◆ **Abu-Laban RB**, Drebit S, Lindstrom RR, Archibald C, Eggers K, **Ho K**, **Khazei A**, Lund A, MacKinnon C, Markham R, Marsden J, Martin E, Christenson JM. The BC Emergency Medicine Network: A Paradigm Shift in the Provincial Emergency Care System. *Cureus* 10(1):1-10, 2018.
- ◆ Harries B, Filiatrault L, **Abu-Laban RB**. Application of Quality Improvement Analytic Methodology to Emergency Medicine Research: A Comparative Evaluation. *Can J Emerg Med*. May 30:1-8. doi: 10.1017/cem.2018.379. (Epub ahead of print) 2018.
- ◆ Saczkowski RS, Brown DJA, **Abu-Laban RB**, Fradet G, Schulze CJ, Kuzak ND. Prediction and risk stratification of survival in accidental hypothermia requiring extracorporeal life support: An individual patient data meta-analysis. *Resuscitation*. 2018;Jun;127:51-57. Epub Mar 23, 2018.
- ◆ Villa-Roel C, Borgundvaag B, Majumdar SR, Emond M, Campbell S, Sivilotti M, **Abu-Laban RB**, Stiell IG, Aaron SD, Senthilselvan A, Rowe BH; AIR Investigators. Reasons and outcomes for patients receiving ICS/LABA agents prior to, and one month after, emergency department presentations for acute asthma. *J Asthma*. Oct 12:1-10. (Epub ahead of print) 2018.
- ◆ Stewart E, Spearing K, **Abu-Laban RB**. CJEM Journal Club: The bougie and first pass success in the emergency department. *CJEM* Feb 2019 (Epub).
- ◆ Marsden J, Drebit S, Lindstrom RR, MacKinnon C, Archibald C, **Abu-Laban RB**, Eggers K, **Ho K**, **Khazei A**, et al. The BC Emergency Medicine Network: Evaluation Approach and Early Findings. *BCMJ* In Press.



Phillip Lopresti
Research Assistant

Publications continued...

- ♦ Walker KE, Migneault D, Lindsay H, **Abu-Laban RB**. Use of personal mobile devices to record patient data by Canadian emergency physicians and residents. In Press, Can J Emerg Med.
- ♦ **Brubacher JR**, Chan H, Erdelyi S, Asbridge M, Mann RE, **Purssell RA**, Solomon R. Police documentation of drug use in injured drivers: Implications for monitoring and preventing drug-impaired driving. Accident Analysis and Prevention. 2018;118:200-206.
- ♦ **Brubacher JR**, Chan H, Erdelyi S, Lovegrove G, Faghihi F. Road Safety Impact of Increased Rural Highway Speed Limits in British Columbia, Canada. Sustainability. 2018, doi:10.3390/su10103555.
- ♦ **Brubacher JR**, Shih Y, Weng JT, Verma R, Evans D, Grafstein E. Low-impact strategy for capturing better emergency department injury surveillance data. Injury Prevention, 2018 Published Online First: 18 October 2018.
- ♦ Chan H, Chiang, T, Yip R, Shih Y, Ho V, Brar R, **Brubacher JR**. Driving Ability and Transportation Needs of Older Drivers Treated in an Emergency Department. Journal of the Australasian College of Road Safety. 2018;29:30-38.
- ♦ Woo SA, Cragg A, Wickham ME, Peddie D, Balka E, Scheuermeyer F, Villanyi D, **Hohl CM**. Methods for evaluating adverse drug event preventability in emergency department patients. BMC Medical Research Methodology 2018;18(1):160.
- ♦ **Hohl CM**, Badke K, Zhao A, Wickham ME, Sivilotti ML, Perry JJ. (2018). Prospective validation of clinical criteria to identify emergency department patients at high-risk for adverse drug events. Academic Emergency Medicine. 25(9): 1015–1026 (Reviewed by NEJM Journal Watch, Best of #FOAMed Emergency Medicine and The Skeptics Guide to Emergency Medicine).
- ♦ Peddie D, Small SS, Badke K, Bailey C, Balka E, **Hohl CM**. (2018). Adverse Drug Event Reporting From Clinical Care: Mixed-Methods Analysis for a Minimum Required Dataset. JMIR Medical Informatics. 6(2): e10248.
- ♦ Stiell IG, Perry JJ, Brehaut J, Brown E, Curran JA, Emond M, **Hohl CM**, Taljaard M, McRae AD. How to conduct implementation trials and multicentre studies in the emergency department. CJEM 2018;20(3):448-452.
- ♦ McRae AD, Perry JJ, Brehaut J, Brown E, Curran J, Emond M, **Hohl CM**, Taljaard M, Stiell IG. Engaging emergency clinicians in emergency department clinical research. CJEM 2018;20(3):443-447.
- ♦ **Hohl CM**, Small SS, Peddie D, Badke K, Bailey C, Balka E. (2018). Why Clinicians Don't Report Adverse Drug Events: A Qualitative Study. JMIR Public Health Surveillance. 4(1): e21.
- ♦ Cragg A, Hau JP, Woo SA, Liu C, Doyle-Waters MM, **Hohl CM**. Risk factors for addiction among patients receiving prescribed opioids: a systematic review protocol. Systematic Reviews. 2017;6(1):265.
- ♦ Guo D, Phan N, **Ho K**, Pawlovich J, Kitson N. Clinical Texting Among Medical Trainees of the University of British Columbia. J Cutan Med Surg. 2018 Jul/Aug;22(4):384-389. doi: 10.1177/1203475418758292.
- ♦ Holmes BJ, Bryan S, **Ho K**, McGavin C. Engaging patients as partners in health research: Lessons from BC, Canada. Healthc Manag Forum. 2018;31(2):41–4.



Dr. Louise Cassidy
EM Resident

Louise Cassidy was awarded a Resident Innovation Fund for her project on “Post shift road safety in British Columbia Medical Residents”



Dr. Ka Wai Cheung
Associate Research Director

Publications continued...



Dr. Jesse Godwin
Toxicology Research

*Validation phase of
Syncope Study has
successfully
completed*



Dr. Paul Huang
Syncope Study

- ◆ Inskip JA, Lauscher HN, Li LC, Dumont GA, Garde A, **Ho K**, et al. Patient and health care professional perspectives on using telehealth to deliver pulmonary rehabilitation. *Chron Respir Dis*. 2018;15(1):71–80.
- ◆ Novak Lauscher H, **Ho K**, Cordeiro JL, Bhullar A, Abu Laban R, Christenson J, et al. MP44: TEC4Home heart failure: using home telemonitoring to decrease ED readmissions and clinical flow. *CJEM [Internet]*. 2018 May 11;20(S1):S56–7.
- ◆ Novak Lauscher H, Stacy E, Christenson J, Clifford B, Flood F, Horvat D, Markham R, Pawlovich J, Rowe P, **Ho K**. MP34: Evaluation of real-time virtual support for rural emergency care. *CJEM [Internet]*. 2018 May 11;20(S1):S53.
- ◆ Zibrik L, Huang A, Wong V, Novak Lauscher H, Choo Q, Yoshida EM, **Ho K**. Let's Talk About B: Barriers to Hepatitis B Screening and Vaccination Among Asian and South Asian Immigrants in British Columbia. *J Racial Ethn Heal Disparities[Internet]*. 2018Dec19;5(6):1337–45.
- ◆ Kocerginski J, **Ho K**, Golby R, Borycki EM, Kushniruk AW, Born J, Juhra C. Canadian Validation of German medical Emergency Datasets. *Stud Health Technol Inform*. 2018;257:212-217.
- ◆ Olszynski P, **Kim D**, Chenkin J, Rang L. The core emergency ultrasound curriculum project: A report from the Curriculum Working Group of the CAEP Emergency Ultrasound Committee. *CJEM* 2018; 20(2):176-82. doi: 10.1017/cem.2017.44.
- ◆ Olszynski P, **Kim DJ**, Chenkin J, Rang L. The CAEP emergency ultrasound curriculum – Objectives and recommendations for implementation in postgraduate training: Executive summary. *CJEM* 2018; 20(5):736-8. doi: 10.1017/cem.2018.35.
- ◆ Cessford T, Meneilly GS, Arishenkoff S, Eddy C, Chen LYC, **Kim DJ**, Ma IWY. Comparing physical examination with sonographic versions of the same examination techniques for splenomegaly. *J Ultrasound Med* 2018; 37(7):1621-9. doi: 10.1002/jum.14506.
- ◆ Prager R, Sedgwick C, Lund A, **Kim DJ**, Ho B, Stachura M, Gutman SJ. Prospective evaluation of point-of-care ultrasound at a remote, multi-day music festival. *Prehosp Disaster Med* 2018; 33(5):484-489. doi: 10.1017/S1049023X18000821.
- ◆ Atkinson P, Olszynski P, Chenkin J, **Kim DJ**, Hall G. *CJEM Debate Series: #PoCUS – All physicians practicing emergency medicine should be competent in the use of point of care ultrasound*. *CJEM* 2018; 20(3):329-33.
- ◆ **Kim DJ**. Emergency medicine myths and misconceptions: Challenging the dogma by evaluating the evidence. *Br J Hosp Med (Lond)* 2018;79(9):516-519.
- ◆ Murray DJ, **Kim DJ**. An unusual case of exertional dyspnea: Atrial myxoma on point of care ultrasound. *CJEM* 2018; 20(1):146-7. doi: 10.1017/cem.2017.351.
- ◆ Iradukunda D, Lee J, **Kim DJ**. Unexpected source of fever: Liver abscess on point of care ultrasound. *CJEM* 2018; 20(5):802-3. doi: 10.1017/cem.2018.408.
- ◆ **Moe J**, Camargo CA Jr, Jelinski S, Erdelyi S, **Brubacher J**, Rowe BH. Epidemiologic Trends in Substance and Opioid Misuse-Related Emergency Department Visits in Alberta: A cross-sectional time-series analysis. *Can J Public Health*, 2018Apr;109(2):164-173. PMID: 29981040.
- ◆ **Moe J**, Camargo CA Jr, Davis RB, Jelinski S, Rowe BH. Association Between Frequent Emergency Department Use and Mortality In Substance and Opioid Use

Publications continued...

- in Alberta: A Linked NACRS Database Analysis. Canadian Journal of Emergency Medicine, 2019 (Accepted).
- ♦ **Moe J**, Oland R, Moe G. Impact of a Primary Care After-Hours Clinic on Avoidable Emergency Department Visits and Costs: A cross-sectional, time series analysis. Health Care Quarterly, 2019 (In Press).
 - ♦ Moe G, **Moe J**, Bailey . Evaluating the Implementation of Collaborative Teams in Community Family Practice - Using the Primary Care Assessment Tool (PCAT). Canadian Family Physician, 2019 (In Press).
 - ♦ Shaw L, **Moe J**, Purssell R, Buxton J, Godwin J, Doyle-Waters MM, Brasher P, Hau J, Curran J, **Hohl C**. Naloxone Interventions in Opioid Overdoses: Systematic review protocol. Systematic Reviews, 2019 (In review).
 - ♦ **Moe J**, **Godwin J**, **Purssell R**, O'Sullivan F, Hau JP, Purssell E, Curran J, Doyle-Waters MM, Brasher PMA, Buxton JA, **Hohl CM**. Naloxone Dosing in the Era of Ultra-Potent Opioid Overdoses: A Systematic Review. Annals Int Med., 2019 (In review).
 - ♦ Jiang A, Smith J, Rajabali F, Zheng A, **Purssell R**, Pike I. Patterns in poisoning hospitalizations and deaths in British Columbia, 2008 to 2013. BC Medical Journal 2018;60:493-500.
 - ♦ Yarema M, Chopra P, Sivilotti MLA, Johnson D, Nettel-Aguirre A, Bailey B, Victorino C, Gosselin S, **Purssell R**, Thompson M, Spyker D, Rumack B. Anaphylactoid Reactions to Intravenous N-Acetylcysteine during Treatment for Acetaminophen Poisoning. Journal of Medical Toxicology 2018;14:120-127.
 - ♦ Pardhan A, **Van Dewark K**, Chan T. The Balancing Act: Learning to Thrive in Multipatient Environments. CLOSLER. John Hopkins Medicine Feb 2019
 - ♦ Chan T, **Van Dewark K**, Sherbino J, Lineberry M. Coaching for Chaos: A qualitative study of instructional methods for multipatient management in the emergency department, AEM Education and Training, 2018 Dec; 10(4).
 - ♦ **Abu-Laban RB**, Drebit S, Svendsen B, Chan N, **Ho K**, **Khazei A**, Lindstrom R, Lund A, Marsden J, Christenson J. Process and findings informing the development of a provincial emergency medicine network. Healthcare Management Forum. September 2019. (in press)
 - ♦ Moore J, Sanderson M, **Abu-Laban RB**. CJEM Journal Club: Epinephrine in Cardiac Arrest: The PARAMEDIC2 Trial. Can J Emerg Med. 2019. (In press)

Presentations

- ♦ **Brubacher JR**. Cannabis and Motor Vehicle Crashes: What is the evidence? (Invited presentation) Canadian Council of Motor Traffic Administrators. 2018 Annual Meeting. Quebec City, QC. June 2018.
- ♦ **Brubacher JR**, Chan H, Erdelyi S. Trends in THC prevalence in crash involved drivers, British Columbia, 2011 - 2016. Canadian Association of Road Safety Professionals (CARSP) conference. Victoria, BC. July 2018.
- ♦ **Brubacher JR**, Chan H, Erdelyi S. Cannabis and Motor Vehicle Crashes: A Culpability Study. Canadian Association of Road Safety Professionals (CARSP) conference. Victoria, BC. July 2018.
- ♦ **Brubacher JR**, Chan H, Erdelyi S. How often do police document drug use in crash



Dr. Jan Trojanowski
Airway Registry

The airway registry project aims to improve airway management at VGH



Dr. Afshin Khazei
Emergency Medicine
Physician

Presentations



Dr. Herbert Chan, PhD
Research Associate
Road Safety Research

Student research assistants help with chart reviews, data entry, patient recruitment, and literature searches

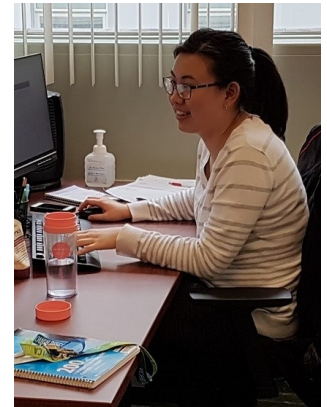


Shannon Erdelyi
Statistical Analyst

- involved drivers who used an impairing substance? Canadian Association of Road Safety Professionals (CARSP) conference. Victoria, BC. July 2018.
- ♦ **Brubacher JR.** Impacts of Speed Limit Changes in BC. (Invited presentation) Canadian Association of Road Safety Professionals (CARSP) conference. Victoria, BC. July 2018.
- ♦ Chan H, Chiang T, Yip R, Shih Y, Ho V, Brar R, **Brubacher J.** Driving Ability and Transportation Needs of Older Drivers Treated in an Emergency Department. Australasian College of Road Safety Conference. Sydney, NSW, Australia. October 2018 (Poster Presentation).
- ♦ Mueller A, Virji-Babul N, Panenka W, Iverson G, **Brubacher JR**, Lange R. Longitudinal changes in gray matter volume and gray matter network architecture in individuals with mild traumatic brain injury during the first year after injury. Thirteenth World Congress on Brain Injury. Toronto, ON. Mar 2019.
- ♦ Balka E, Peddie D, Small SS, Ackerley C, Trimble J, **Hohl CM.** Barriers to scaling up participatory design interventions in health IT: A case study. Proceedings from Participatory Design Conference 2018 (PDC '18). Hasselt & Genk, BE. Aug 2018.
- ♦ Perry JJ, Sivilotti MLA, Emond M, **Hohl CM**, Lesiuk H, Sutherland J et al. (2-18) Multicentre before-after implementation study of the Ottawa subarachnoid hemorrhage strategy. Top Ranked Abstract and winner of the Grant Innes Award. CAEP Scientific Conference 2018; Calgary, AB. May 2018.
- ♦ Small SS, Barry K, Radley L, **Hohl CM**, Balka E. Patient engagement in a health technology research program: Perspectives on process and lessons. 2018 Annual CA-HSPR Conference. Montreal, QC. May 2018.
- ♦ Peddie D, Small SS, Wickham M, Badke K, Woo S, **Hohl CM**, Balka E. Incorporating participatory design approaches into HTA. HTAi Annual Meeting. Vancouver, BC. June 2018. (Poster presentation)
- ♦ Woo SA, Cragg, A, Wickham ME, Peddie D, Balka E, Scheuermeyer F, Villanyi D, **Hohl CM.** Evaluating the preventability of adverse drug events. Centre for Health Services and Policy Research (CHSPR) 2019: Value in Canadian Healthcare: Evolution or Revolution? Vancouver, BC, March 2019.
- ♦ Jamin A, Novak Lauscher H, Stacy E, Hyman A, **Ho K.** Learning for Life: Building Digital Health Literacy Skills and Healthy Lifestyle Behaviours Among Intermediate Elementary Students for the Prevention of Type II Diabetes. Vancouver Diabetes Research Day, Vancouver, BC. 2018.
- ♦ **Ho K**, Novak Lauscher H, Bhullar A, Cordeiro J, Malovec S, Harps H. Scaling up Home Telemonitoring: Insights and Lessons from TEC4Home. e-Health, Vancouver, BC. May 2018.
- ♦ **Ho K**, Cordeiro J, Novak Lauscher H, Ng N, Harps H, Malovec S. Supporting COPD Patients with Home Telemonitoring: Insights from TEC4Home. e-Health, Vancouver, BC. May 2018.
- ♦ **Ho K**, Bhullar A, Cordeiro J, Novak Lauscher H, Harps H, Malovec S. Heart Failure telemonitoring: Pilot Project Findings and Full Trial Implementation. e-Health, Vancouver, BC. May 2018.

Presentations continued...

- ♦ Novak Lauscher H, Stacy E, Christenson J, Clifford B, Flood F, Horvat D, Markham R, Pawlovich J, Rowe P, **Ho K**. Evaluation of real-time virtual support for rural emergency care in Robson Valley. UBC Department of Emergency Medicine Research Day, Vancouver, BC. Apr 2018.
- ♦ **Ho K**, Bhullar A, Cordeiro J, Novak Lauscher H, Harps H, Malovec S. TEC4Home Heart Failure: Using home telemonitoring to decrease ED readmissions and clinical flow, UBC Department of Emergency Medicine Research Day, Vancouver, BC. Apr 2018.
- ♦ Stacy E, **Ho K**. Integrating cultural humility into health care using a video on Indigenous health. Quality Forum, BC Patient Safety and Quality Council, Vancouver, BC. Feb 2018.
- ♦ **Kim, D**. Visual Diagnosis in Emergency Medicine. Small Group Workshop. 53rd Annual Post Graduate Review in Family Medicine, UBC Continuing Professional Development, Vancouver, BC. Feb 2018.
- ♦ **Kim, D**. CAEP SonoGames 2018. Judge, Educational Ultrasound Competition. “SonoGames Qualifying” Track, CAEP 2018 Annual Conference, Calgary, AB. May 2018.
- ♦ **Kim, D**. POCUS the Next Generation: The Future of Ultrasound in Canada. Lecture. “Advanced Ultrasound in the Modern ED” Track, CAEP 2018 Annual Conference, Calgary, AB. May 2018.
- ♦ **Kim, D**. Emergency Medicine Myths and Misconceptions: Practices We Should Re-evaluate and Either Change or Discontinue Altogether. Lecture. “Emergency Medicine Tips” Track, International Conference on Emergency Medicine (ICEM) 2018, Mexico City, Mexico. June 2018.
- ♦ **Kim, D**. Don’t Blink: Plain Film Diagnoses You Cannot Afford to Miss. Lecture. “Emergency Imaging” Track, ACEP18 Scientific Assembly, San Diego, CA. Oct 2018.
- ♦ **Kim, D**. Tapping the Joint. Lecture. “Emergency Imaging” Track, ACEP18 Scientific Assembly, San Diego, CA. Oct 2018.
- ♦ **Kim Sing C, Ho K**. Putting Heart Failure Patient’s Experiences at the Centre of Home Health Monitoring Research Design, UBC Department of Emergency Medicine Research Day, Vancouver, BC. Apr 2018.
- ♦ **Moe J**. How ER Data Can Save Lives. Canadian Association of Emergency Physicians 2018 Rising Star, Calgary, AB. May 2018.
- ♦ **Moe J**. Epidemiologic trends in substance and opioid misuse in Alberta: a cross-sectional, time-series analysis. Canadian Association of Emergency Physicians, Calgary, AB. May 2018.
- ♦ **Moe J**. Epidemiologic trends in substance and opioid misuse in Alberta: a cross-sectional, time-series analysis. UBC Department of Emergency Medicine Research Day, Vancouver, BC. Apr 2018.
- ♦ **Moe J**. Familiar Faces in the ED: Opportunities for Prevention & Cost-Saving. Alberta Health Services Emergency Strategic Clinical Network, Edmonton, AB. June 2018.
- ♦ Lem M, Chiang T, Leung V, et al (including **Pursell R**). Quantification of Fentanyl



Leona Shum
Research Coordinator
Road Safety Research

*Last summer, the
Road Safety Re-
search team hosted
visiting scientists
from Japan*



Fiona O’Sullivan, PhD
Research Coordinator
Opioid research



Dr. Erik Vu
Pre-hospital care

Herbert Chan and co-authors received the best road safety poster award at the 2018 Australasian Road Safety Conference

Presentations continued...

Exposure to Health Care Workers: Environmental Sampling in Overdose Prevention and Supervised Consumption Service Sites. American College of Medical Toxicology, 2018 Annual Scientific Meeting, Washington DC.

- ◆ **Renschler CJ**, Dullemond K, **Yoo JH**, Liu C, **Brubacher JR**, Griesdale D, **Trojanowski J**. The British Columbia Airway Registry for Emergencies (BCARE): Registry expansion and development of protocol for measurement of data collection compliance. Poster presentation at CAEP Conference, Calgary, Alberta, May 2018.
- ◆ **Walker KE**, **Migneault D**, **Lindsay HC**, **Abu-Laban RB**. Utilization of Personal Mobile Device to Record Patient Data by Emergency Physicians and Residents. Presented at CAEP Annual Conference, Calgary, May 26-30, 2018.
- ◆ Ting DK, **Abu-Laban RB**, Morrison L, Ducharme J, Lang ES. Implementation of an Editorial Internship at the Canadian Journal of Emergency Medicine to Foster Education and Participation in Academic Emergency Medicine. Presented at CAEP Annual Conference, Calgary, May 26-30, 2018.
- ◆ **Ho K**, Cordeiro J, Bhullar A, **Abu-Laban RB**, Christenson, J, Harps H, Hawkins N, Karim E, Kim Sing C, McGavin C, Mitton C, Smith T, Novak Lauscher H on behalf of the TEC4Home Innovation Community. TEC4Home Heart Failure: Using home telemonitoring to decrease ED readmissions and clinical flow. Presented at CAEP Annual Conference, Calgary, May 26-30, 2018

ED Staff Involvement

Our research would not be possible without the involvement and ongoing support from Emergency Department Nurses, Unit Clerks, Admitting Staff and Physicians. We are fortunate to have an amazing team that continues to engage in research while providing top notch patient care.



Research Team Mascot: Marco



ED nurses: Ladan, Megan, Benjamin

Collaborative Research Policy

The VGH Department of Emergency Medicine has a tradition of producing high quality original research, and collaborating on the research initiatives of other VGH Departments or external groups. This academic mission must be balanced with the demands research places on ED patient care and teaching of Residents and Medical Students. In addition, simultaneous research projects may conflict with one another and may compete for the same patients as well as for the time and attention of our clerical, nursing, and medical staff.

For these reasons, all potential studies which require signoff by the VGH Department of Emergency Medicine undergo internal review, approval, and prioritization. It is expected that one or more members of the VGH Department of Emergency Medicine will be involved academically (as co-applicant on grants, and co-author on publications) on any significant peer-reviewed or investigator-initiated collaborative project conducted in the VGH ED. This involvement should commence during the development of the study protocol and the ED should receive appropriate acknowledgement for the role it plays for any such projects.

For further information on our research policy or to discuss a potential project please contact our Research Director (**Jeff Brubacher**; Jbrubacher@shaw.ca).

Research Personnel

Director: Jeff Brubacher

Associate Director: Ka Wai Cheung

Research Advisory Committee

Jeff Brubacher (chair)

Corinne Hohl

Heather Lindsay

Jess Moe

Kendall Ho

Riyad Abu-Laban

Roy Purssell



Research Coordinators: Rupinder, Angela, Vi



Road Safety Research: Breathalyzer demonstration with visiting Japanese scientists by RCMP drug recognition experts.

Student Involvement

Students play a valuable role in our research division, and we are grateful for the dedicated and motivated individuals who have donated their time. In turn, students gain exposure to emergency medicine and clinical research.

Medical Students

Andrew Chang
Andy Jiang
Ben Ng
Christine Liu
Connor Mcsweeney
Emily Lostchuck
Kia Dullemond
Raymond Cho

Co-op Students

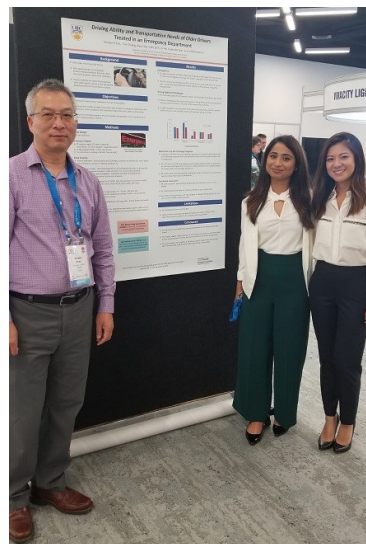
Anmol Sangha
Hiresh Hiresh
Imad Ahmad
Jennifer Park
Jocelyn Cheng
Lexynn Kwan
Martina Knappett
Rebecca Lee
Sasha Mohsenian

Student Volunteers

Jacky Chen
Jenna McEwan
Maya Khazei
Michael Lai

Work Learn Students

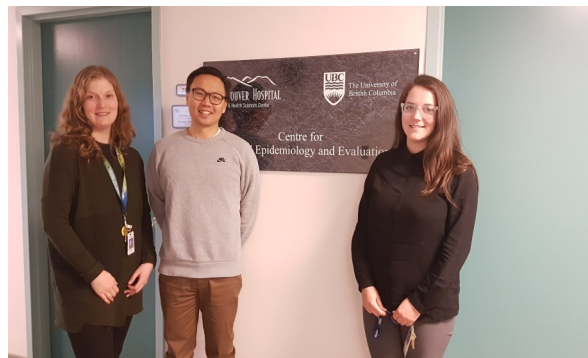
Louise Meddings
Simarpreet Pattar
Victoria Purcell



Australasian Road Safety Conference:
Herbert Chan, Rupinder Brar, Vi Ho



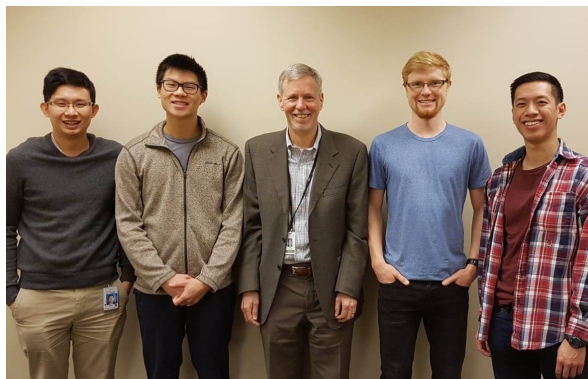
CAN-TBI team: Sim Pattar, Martina Knappett, Louise Meddings, Victoria Purcell



ADE research group: Amber Cragg, Jeffrey Hau, Serena Small



Road Trauma Outcome: Sasha Mohsenian



Opioid Study Team: Andy Jiang, Ben Ng, Dr. Roy Purcell, Chris Cochrane, Andrew Chang