Over the last year...

54 Presentations
46 Publications in peer reviewed journals
29 Research Assistants & Student Volunteers
3 New CIHR Grants

The Emergency Department Research Division has completed another productive year!

Congratulations to our researchers

**Brubacher, JR.** (Asbridge, M., Brasher, P., **Chan, H.**, Lovegrove, G., Pike, I., Schuurman, N.): Evaluation of Speed Limit Changes in British Columbia. CIHR $249,662

**Brubacher, JR.** (Staples, J. (PI), Redelmeier, D., **Chan, H.**): Syncope and the subsequent risk of motor vehicle crash: A population-based analysis. CIHR $180,000


**Ho, K.** (Novak Lauscher, H., Stacy, E.): Inter-Cultural Online health Network (iCON): engaging multicultural communities in B.C. BC Ministry of Health. $670,035

**Ho, K.** (Yao, C., Rolofesen, D., Stacy, E., Novak Lauscher, H., Ganton, L., Cairns, S.): Mobile Digital-health for Activity and Wellness - mDAWN Kids: Using online comics, mHealth and wearables for Type 2 Diabetes Prevention for Middle Years Children. Lawson Foundation $110,000 ($220,000 over 2 years)

**Ho, K.** (Novak Lauscher, H., Stacy, E.): Learning for life: Raising eHealth Literacy in BC. Private Foundation $100,000 ($200,000 over 2 years)
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 Emergency Department 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 Emergency Department. 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 Projects

Telehealth for Emergency-Community Continuity of Care Connectivity via Home-Telemonitoring (TEC4Home): Drs Kendall Ho and Chad Kim Sing recently launched a prospective feasibility study involving home health monitoring (HHM) in patients with heart failure. Patients with heart failure (HF) can easily get sick and often need to visit emergency departments (ED) for treatment. One way to help them recover is through home health monitoring (HHM) – using home-based technologies to monitor their breathing, blood pressure, weight, and how they feel. Research has shown that HHM can help HF patients stay healthy, feel safe with the supervision of their doctor while they recover at home, and reduce the number of hospital visits.
Research Projects continued...

VCH, in partnership with the UBC Faculty of Medicine Digital Emergency Medicine group and BC Ministry of Health, will be using national research funding they have obtained in late 2015 to put in place a HHM system over the next 4 years for HF patients recovering from emergency department visits due to their illnesses. This project called TEC4Home started at Vancouver General and St. Paul’s Hospitals last year, and then will spread to other communities in VCH over the next 3 years.

A related project, funded by VCHRI, will involve HF patients to find from them how HHM can help them to stay healthy and support their recovery. We will first look at patient satisfaction surveys from EDs in the past to identify what they need most when leaving hospitals. Then, we will compare the findings with the latest research in HHM to see how home monitoring can help provide patients with what they need. We will then invite HF patients to ask them directly how they would use HHM themselves for the management of their illness. Their views will be important in guiding future research activities in the province of BC that will improve the care, health, and wellness of patients with HF.

ED Opioid Overdose Treatment Study: Drs. Roy Purssell and Jesse Godwin have initiated a retrospective cohort study funded by the Michael Smith Foundation for Health Research to evaluate the safety and efficacy of different naloxone dosing regimens. Health records of patients treated for opioid overdose in the EDs of seven urban hospitals from Jan 1, 2014 to Dec 31, 2016 are being reviewed. The study compares the proportion of patients who have adequate 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 433 illicit drug overdose deaths from January to July 2016, the majority of which involve the opioid, fentanyl. The optimal management of overdoses 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.

VGH Emergency Department 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 & Jeff Brubacher involves the development and implementation of an airway registry. This will allow 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, 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.
Research Projects Continued...

Assessment of modified flipped classroom model in emergency ultrasound (US) education: Dr. Donna Lee along with team members Drs. Dan Kim, Maja Stachura, and Mario Francispragasam have proposed to teach US techniques using the flipped classroom paradigm. The purpose is to make more efficient use of both learner and faculty time, to improve student engagement and interest, and to improve the quantity of information transferred. The aim is to develop a modified flipped classroom for medical students in order to learn and understand the role of emergency point of care US for unstable patients in a classroom setting prior to engaging their EM rotation.

Process Mapping as a Framework for Performance Improvement in Emergency General Surgery: This project took a cohort of patients with small bowel obstruction (SBO) from the American College of Surgeons (ACS) National Surgical Quality Improvement Emergency General Surgery pilot project (NSQIP), and process mapped their journey through VGH. Several time points were collected including the following: time to ED triage, assessment by an ED Physician, CT scan, General Surgery consult request, assessment by General Surgeon, admission to the General Surgery service, transport to ward, operative case booking, arrival in the OR, and time of discharge. It was found that patients experience the greatest variability in getting to the CT scanner and getting to the OR. This quality improvement project aims to use process mapping as a framework for performance improvement, to help streamline how patients move through the ED, and hopefully will lead to safer and more efficient care.

Clinical Impact of 24/7 Staff Radiologist Coverage in the VGH ED: Drs. Savvas Nicolaou, Chad Kim Sing, and team are involved in a project evaluating the clinical impact of 24/7 staff radiologist coverage in the ED. The purpose is to compare radiology report turn-around time and patient length of stay (LOS) in the VGH ED before and after the implementation of 24/7 on-site staff radiologist coverage. The current model of 24/7 on-site staff radiologist coverage was implemented on October 1, 2013. This was followed with progressively increasing hours spent by staff radiologists on imaging studies for patients in the VGH ED over the subsequent years. Our site was the first Academic Hospital in Canada to offer 24/7 Staff ED Radiologist coverage. This study will evaluate the 12-month period immediately before and immediately after October 1, 2013. Economic impact will also be investigated.

Road Safety: Dr. John Staples of internal medicine at St. Paul’s Hospital joined our road safety research team last year and has successfully obtained a CIHR grant studying syncope and subsequent risk of motor vehicle crash. Drs. Brubacher and Chan are co-investigators for this project.

The Cannabis and Motor Vehicle Crashes project has reached its goal of collecting blood samples from 3000 injured drivers. The samples are in queue for toxicology analysis. Once toxicology analysis is complete we will be able to report on the association of cannabis and motor vehicle crash risk. We are currently preparing another research paper using available toxicology data and police reports to examine the ability of police to recognize drug impaired driving among injured drivers.

In late 2015, Drs. Brubacher, Chan and Purssell conducted an online survey to gather feedback and opinions of BC physicians, particularly EM physicians, on reporting
unfit drivers. We have completed a draft report of this survey which is currently being reviewed by RoadSafetyBC and by the Emergency and Public Safety Committee of DoctorsofBC. An information package with recommendations for physicians regarding fitness to drive will follow.

With the help of volunteer medical students, we have completed a chart review project (Active Transportation and Injuries) examining the profiles and circumstances of cycling and pedestrian injuries using data from VGH ED. We found that over 2/3 cycling injuries were caused by single bicycle incidents and over 70% pedestrian injuries did not involve moving motor vehicles. The results suggest that, in order to encourage active transportation, policy makers should pay more attention to fall prevention outside the home environment and to road infrastructure for safer cycling activity.

One of our research assistant, Vahid Mehrnoush has enrolled in the UBC Experimental Medicine Masters Program. His project will determine the association between leisure time activity and risky driving behaviors among young drivers; this will provide insight into certain personality traits and leisure time activities in relation to risk behavior in youth drivers.

RAFF-2 Study: This is a randomized, controlled comparison of electrical versus pharmacological cardioversion for ED patients with Recent-Onset Atrial Fibrillation and Flutter (RAFF). This multi-centered study, led by Dr. Hohl is looking to improve the early ED management of RAFF patients, ultimately leading to higher rhythm conversion rates and lower admission rates. The aim is to create effective, safe, and efficient pathways for RAFF patient management in Canada. Our site has successfully enrolled 13 cases.

Traumatic Brain Injury: “CAN-TBI: A National Biobank & Database for Patients with Traumatic Brain Injury” is a study running in multiple hospitals across Canada; VGH is the primary site in BC. Led nationally by Dr. Jamie Hutchinson of The Hospital for Sick Children in Toronto, and locally by Drs. William Panenka (Psychiatry) and Jeff Brubacher, 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 TBIs. Small samples of blood are collected within 24 hrs of injury for every enrolled patient, 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 and rehab strategies.

Working closely with the clinical staff in the ED & ICU at VGH, and in conjunc-
Research Activity Continued...

In cooperation with the BC Children's Biobank, the team has enrolled 67 patients since Sept 2016. In the next year, we are aiming to expand the study into BC Children's Hospital and begin enrolling from a paediatric population. Further research launched from this platform will take part in the international effort to transform care and improve outcome in patients with TBI.

**Syncope Study:** This prospective validation of the Canadian Syncope Risk Scale study, led by Dr. Paul Huang is funded by Cardiac Arrhythmia Network (CANet). Syncope is a common presentation to the Emergency Department. Syncope can rarely be a sign of underlying heart disease. The goal of this study is to validate a tool to help Emergency physicians risk stratify syncope patients in order to reduce the uncertainty in medical decision-making. Data collection is ongoing.

**Prehospital Tranexamic Acid (TXA) use for Traumatic Brain Injury:** Dr. John Tallon and his research team just completed recruitment for a RCT to determine the efficacy of two dosing regimens of TXA initiated prior to hospital arrival and continuing in hospital for 8 hours, on long-term neurologic outcome compared to placebo in patients with moderate to severe TBI who are not in shock. Of the 12 participating sites, BC and Toronto are the only Canadian sites. The designated hospitals in BC, Vancouver General and the Royal Columbian, contributed a total of 34 cases.

**Adverse Drug Events:** In 2013, Dr. Hohl and her research team was funded by CIHR and partnership organizations to develop a better means of documenting Adverse Drug Events (ADEs) in electronic health records by defining a functional minimal dataset for ADEs, and working with stakeholders to integrate ADE reporting into PharmaNet, BC’s medication information system, through local electronic systems.

In November 2014 Bill C-17, a law that requires Canadian healthcare institutions to report serious adverse drug reactions, a subset of ADEs, was passed by the federal government. Our work aligns with this legislation by providing a new framework for integrating ADE reporting into clinical care documentation.

In October 2015, Dr. Hohl’s research team received a grant through the CIHR eHealth Innovation and Partnership Program (eHIPP), with partners PHEMI Systems Incorporated and the College of Pharmacists of BC, to build the reporting platform, and pilot its integration into an electronic medical record. The team is developing an evaluation protocol to determine the impact of enabling the ADE reporting interface on health outcomes.

In 2016, Dr. Hohl received a five-year Foundation grant to continue her work building better systems and enhancing research capacity to reduce ADEs. Dr. Hohl and her research team were also funded by the Drug Safety and Effectiveness Network (DSEN) to answer a Health Canada query regarding the preventability of and contributing factors for ADEs. After collecting these data, the team plans to conduct further investigations identifying the proportion of preventable ADEs that are repeat events and the effect of preventable and repeat ADEs on patient and health services utilization outcomes.
Research Education: Dr. Riyad Abu-Laban, UBC Department of EM Research Director, led the highly successful 6th annual "NERD Block" (Novel Education in Research & Design) for 15 Royal College EM Residents and Peds EM Fellows with Dr. Quynh Doan in the fall of 2016. 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 gained wide attention, both across UBC and nationally. The first "NERD 2.0" will run September 25 - October 20, 2017 and any VGH EPs interested in participating are encouraged to contact Dr. Abu-Laban for further information.

NERD Family 2016

Publications


Publications continued...


Publications continued...


27. Kim DJ. Enhance the valsalva to (actually) terminate SVT. UBC Continuing Professional Development: This Changed My Practice; 2016.


Publications continued...


43. Tsai AP, Tsai JP, Stewart L, Brubacher JR, Cheung KW. Prevalence of potential smoking-related conditions among tobacco users in the ED and their perception that their visit may be smoking-related. CJEM. 2016 Oct 17:1-6.


Our research coordinators, Rupinder Brar, Vi Ho, and Angela Aquino oversee recruitment of ED patients and logistics for our studies. They also supervise and coordinate student assistant schedules.
Presentations


16. Hohl CM. Prospective validation of a clinical decision rule to identify patients at high-risk of adverse drug events in EDs. CAEP 2016 Conference. Quebec City.


Presentations continued...


Presentations continued...


39. **Sweet D.** “Sepsis: Putting it all together based on evidence” Alaskan Hospital Association Quality Safe Table, Anchorage, Alaska, USA.

40. **Sweet D.** Early Recognition and Treatment of Sepsis-The British Columbia Approach” Alaskan Hospital Association Quality Safe Table. Anchorage, Alaska, USA.

41. **Sweet D.** Early Sepsis Management. 32nd Annual Infectious Disease Conference. Seattle, Washington, USA.

42. **Sweet D.** Sepsis Panel Discussion. Interesting Cases. 32nd Annual Infectious Disease Conference. Seattle, Washington, USA.

43. **Sweet D.** Sepsis Quality Improvement- BC Experience. Lecture to Washington State Hospital Association Quality Improvement Safe Table. USA.

44. **Sweet D.** In-Patient Sepsis tool in FHA and Sepsis Update. Lecture to all of Fraser Health Authority to discuss implementation of new Sepsis ID tool. Surrey Memorial Hospital, Surrey.


46. **Sweet D.** Challenging cases panel. University of Washington 4th Annual Sepsis Conference. Seattle, USA.

47. **Sweet D.** Controversies in Early Sepsis Management. University of Washington 4th Annual Sepsis Conference. Seattle, USA.

48. **Sweet D.** A Quality Debate: Accountability Hinders Improvement. Quality Forum 2016”. Vancouver, Canada. Invited to be one of 4 debaters on stage along with Jim Easton (UK), Lakshman Swamy (USA), Linda Dempster (Fraser Health).


50. Tran W, Zhuang M, **Ho K.** Development of a Medical Mandarin Workshop for Medical Students, UBC Faculty of Medicine. Vancouver.


52. Yatham L, Kozycki J, **Ho K.** Development and preliminary evaluation of MindHealthBC. E-Mental Health International Conference. University of Newcastle, Australia.

53. Wang JI, **Ho K.** Early prevention of major depression in Canadian male workers: the Bro-Matters study. The 7th annual conference of the Canadian Institute for Military and Veteran Health Research. Vancouver.

Research Personnel

Director
Jeff Brubacher (Jbrubacher@shaw.ca)

Investigators
Riyad Abu-Laban (Research Education)
Jeff Brubacher (Road Safety)
Paul Huang (Syncope)
Kendall Ho (eHealth)
Corinne Hohl (Adverse Drug Reactions)
Chad Kim Sing (eHealth)
Roy Purssell (Poison Surveillance)
David Sweet (Sepsis)
John Tallon (Pre-hospital Care)

Research Coordinators
Angela Aquino
Rupinder Brar
Vi Ho

Research Associate
Herbert Chan, PhD (Road Safety)

Advisory Committee
Jeff Brubacher, MD, MSc
Riyad Abu-Laban, MD, MHSc
Brian Chung, MD
Corinne Hohl, MD, MHSc
Chad Kim Sing, MD
Roy Purssell, MD

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.
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

Alex Trajkovski
Andrew Chang
Ben Ng
Bobby Gu
Cherry Lam
Christine Liu
Cristian Vadeanu
Darren Liu
Graeme Sutton
Jian Weng
Kia Dullemond
Katie Zhu
Kelly Huang
Kelly Soros
Prabvir Grewal
Sassan Sangsari
Rahul Verma
Ravi Parhar
Yuda Shih
Caleb Roda

Coop Students

Devine Calanog
Lisa Zhang
Sarah Wong

WorkLearn Student

Shivani Wells

Study Volunteers

Amanda Lee
Ryan Yip
Research Crossword

**Across**
1. _______ Registry—study led by Dr. Jeff Yoo
2. Blood infection
3. Fentanyl is a type of _______
4. TBI expanded
5. “Tech4 _______”
6. Most common arrhythmia presentation in the ED; Atrial “ _______”
7. One of the co-PIs for clue number 4
8. PI for the ADE study
9. Common treatment for irregular heart beats
10. PI for the Opioid Study
11. Drug used to treat Afib

**Down**
12. The “T” in TXA
13. When you are NOT texting while driving, you are practicing (2 words); one of Dr. Brubacher’s research topics
14. The current department head of Emergency at VGH
15. Quick treatment for overdoses (short form name)
16. Detectable molecules that are released in the blood that can be used to mark for trauma or infections
17. Common chief complaint when someone feels faint
18. ED Research Director

Research assistants are experts at deciphering doctor’s writing

Marco, the research team mascot.