

Vancouver General Hospital

VGH Emergency Medicine Research Newsletter

Over the last year...

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

54

Presentations



46

Publications in peer
reviewed journals

29

Research Assistants &
Student Volunteers

3

New CIHR Grants



Congratulations to our researchers

Inside this issue:

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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

Hohl, C., When Treatments Harm: Building Better Systems and Enhancing Research Capacity to Reduce Adverse Drug Events. CIHR Foundation Grant \$1,275,000

Hohl, C., (Balka, E., Bernatsky, SR., Villanyi, D., Dahri, K., Wickham, ME., Cragg, A.): Factors Contributing to the Development of Preventable Adverse Drug Events. Health Canada (Drug Safety and Effectiveness Network). \$100,088

Ho, K., (John, P., Ray, M., Novak Lauscher, H.): Virtual Medicine - Robson Valley & Vanderhoof: Evaluation Component. Northern Interior Rural Division of Family Practice. \$12,000

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., Roloefsen, 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)



Dr. Chad Kim Sing
Department Head
Emergency Medicine

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



Dr. Jeff Brubacher
VGH EM Research Director

Congratulations Continued...

Ho, K., (Novak Lauscher, H., Cordeiro, J.): eHealth Literacy of the General Public in British Columbia. BC Ministry of Health \$250,000 (\$500,000 over 2 years)

KimSing, C., Ho, K., (Ignaszewski, A, McGavin, C., Grafstein, E., Novak Lauscher, H., Christenson, J., Marsden, J., Cuthbertson, L.): Putting Heart Failure Patients’ Experiences at the Centre of Home Health Monitoring Design. VCHRI \$29,940

Lee, D., (**Kim, D.**, Fitzpatrick, P., Brubacher, JR., Hatala, R., Scott, I.): Development of modified flipped classroom for emergency ultrasound training for UBC medical students. UBC Postgraduate Medical Education Office and UBC Teaching Learning Enhancement Fund. \$44,946

Pursell, RA., (**Godwin, J., Kestler, A.**, Stenstrom, R., DeWitt, C., Scheuermeyer, F., Brubacher, JR.): Emergency Department Opioid Overdose Treatment Study. MSFHR \$98,500

Pursell, RA., (Buxton, J., Janjua, J. Balshaw, R., Chong, M.): Opioid Prescribing Evaluation and Research Activities. BCCDC Foundation for Public Health \$4000

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.



Dr. Kendall Ho
TEC4Home and eHealth
Research

*Dr. Purssell presented
the first series of EM
Network webinars on the
BC fentanyl epidemic*

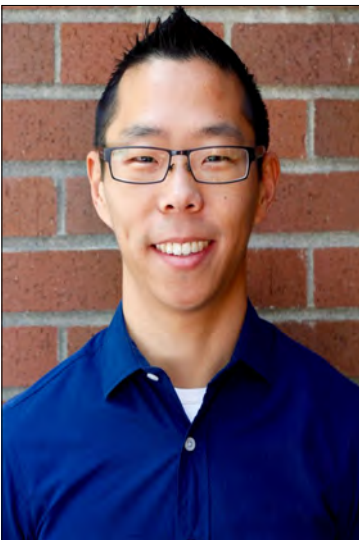


Dr. Roy Purssell
Road Safety &
Toxicology



Dr. Erik Vu
Pre-hospital Care

Dr. Erik Vu and colleagues specialize in pre-hospital care and aeromedical evacuation



Dr. Dan Kim
Ultrasound Teaching & Research

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 Pursell conducted an online survey to gather feedback and opinions of BC physicians, particularly EM physicians, on **reporting**

Research Projects Continued...

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 med 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.



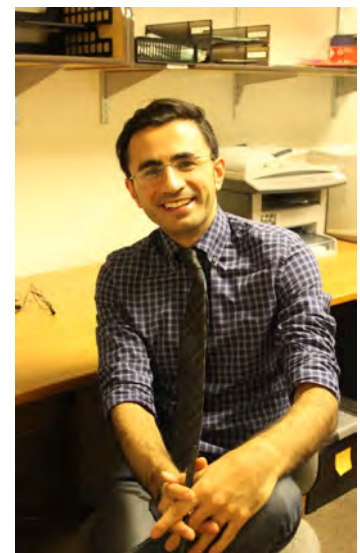
CAN-TBI Study Team (L to R): Angela Aquino, Sarah Wong, Lisa Zhang, Devine Calanog

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



Dr. Corinne Hohl
Adverse Drug Events

Drs. Jeff Brubacher and Herbert Chan have recruited over 3000 patients for their cannabis and motor vehicle crash study



Vahid Mehrnoush
Masters Student
Road Safety Research

Research Activity Continued...



Dr. Herbert Chan, PhD
Road Safety Research

*VGH is prospectively
validating the Canadian
Syncope Arrhythmia Risk
Score*



Dr. Paul Huang
Syncope Study

tion 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.



Dr. Riyad Abu-Laban
Research Education



NERD Family 2016

*Dr. Tallon's TXA
Study looked at
prehospital treatment
for traumatic brain
injury*

Publications

1. **Abu-Laban RB.** Emergency Medicine Training and Practice in Canada: Celebrating the Past and Evolving for the Future. Final Report of the Collaborative Working Group on the Future of EM in Canada. Ottawa, ON: The Canadian Association of Emergency Physicians, The College of Family Physicians of Canada, and the Royal College of Physicians and Surgeons of Canada. June 2016, 152 pp.
2. **Bednarczyk J,** Strumpher J, Jacobsohn E. Inhaled milrinone for pulmonary hypertension in high-risk cardiac surgery: silver bullet or just part of a broader management strategy? Canadian Journal of Anesthesia. 2016. Oct; 63(10):1122-7.
3. Bailey C, Peddie D, Wickham ME, Balka E, **Hohl CM.** Adverse drug event reporting systems - a systematic review. Br J Clin Pharmacol 2016; 82(1):17-29.
4. Born J, Albert J, Borycki EM, Butz N, **Ho K,** Koczerginski J, Kushniruk AW, Schenkel J, Juhra C. Emergency Data Management - Overcoming (Information) Borders. Stud Health Technol Inform. 2016; 231:18-22.



Dr. John Tallon
Pre-hospital Care

Publications continued...



Dr. David Sweet
Sepsis Research

Dr. David Sweet's Blood Culture Study is working to optimize the treatment of patients with severe sepsis



Dr. Afshin Khazei
Emergency Medicine
Procedures

5. Burgess S, **Abu-Laban RB**, Slavic R, **Vu E**, **Zed PJ**. A systematic review of randomized trials comparing hypertonic saline and mannitol for TBIs: Implications for ED management. *Ann Pharmacother*. 2016 Apr; 50(4):291-300.
6. Beatty L, Furey E, Daniels C, Berman A, **Tallon JM**. Radiation Exposure From CT Scanning in the Resuscitative Phase of Trauma Care: A Level One Trauma Centre Experience. *CJEM*. 2015 Nov; 17(6):617-23.
7. **Brubacher JR**, Desapriya E, Erdelyi S, Chan H. The impact of child safety restraint legislation on child injuries in police-reported crashes in British Columbia: An interrupted time series analysis. *Paediatrics & Child Health*. 2016; 21:e27-31.
8. **Brubacher JR**, Chan H, Martz W, et al. The Prevalence of Alcohol and Drug Use in Injured British Columbia Drivers. *BMJ Open*. 2016; 6:e009278.
9. **Brubacher JR**, Chan H, Erdelyi S, Schuurman N, Amram O. The Association between Regional Environmental Factors & Road Trauma Rates: A Geospatial Analysis of 10 Years of Road Traffic Crashes in BC, Canada. 2016;11:e153742.
10. **Brubacher JR**, Desapriya E, Chan H, Ranatunga Y, Harjee R, Erdelyi S, Asbridge M, Pursell R, Pike I. Reprint of "Media Reporting of Traffic Legislation Changes in BC (2010)". *Accident Analysis and Prevention*. 2016; 97:335-341.
11. **Brubacher JR**, Chan H, Pursell E, Tuyp B, Ting DK, Mehrnoush V. Minor injury crashes: Prevalence of driver-related risk factors and outcome. *J of EM*.
12. Chruscicki A, Badke K, Peddie D, Small S, Balka E, **Hohl CM**. Pilot-testing an adverse drug event reporting form prior to its implementation in an electronic health record. 2016 Oct 11;5(1):1764.
13. Cheng AHY, Barclay NG, **Abu-Laban RB**. Effect of a multi-diagnosis observation unit on emergency department length of stay and inpatient admission rate at two Canadian hospitals. *J Emerg Med*. 2016 Dec; 51(6):739-747.
14. Cherpitel CJ, Ye Y, Andreuccetti G, Stockwell T, Vallance K, Chow C, **Brubacher JR**, Risk of injury from alcohol, marijuana and other drug use among emergency department patients, *Drug and Alcohol Dependence*.
15. Douglas R, Garg Arun K, **Ho K**, Lee V, Majid S, Stacy E. Facilitators of and barriers to accessing clinical prevention services for the South Asian population in Surrey, BC: a qualitative study. *Can Med Assoc J*. 2016. 4(3):E390-E397.
16. Fingrut W, **Stewart L**, **Cheung KW**. Choice of smoking cessation counselling via phone, text, or email in ED patients. *Prev Med Rep*. 2016 Oct 29; 4:597-600. 2016.
17. Gorley C, Lindstrom R, McKeown S, Krause C, Pamplin C, **Sweet D**, Marsden J, Kennedy C. Exploring distributed leadership in the BC Sepsis Network. 2016.
18. **Hohl CM**, Balka E, Ackerley C. Technology to prevent adverse drug events. *Quality Matters* 2016 Spring/Summer; 9(1):33-37.
19. **Hohl CM**, Partovi N, Ghement I, Wickham ME, McGrail K, Reddekopp LN, Sobolev BG. Impact of early in-hospital medication review by clinical pharmacists on health services utilization. (in press).
20. **Ho K** and the TEC4Home Healthcare Innovation Community. Supporting Heart Failure Patient Transitions From Acute to Community Care With Home Telemonitoring Technology: A Protocol for a Provincial Randomized Controlled Trial (TEC4Home). *JMIR Res Protoc* 2016; 5(4):e198.

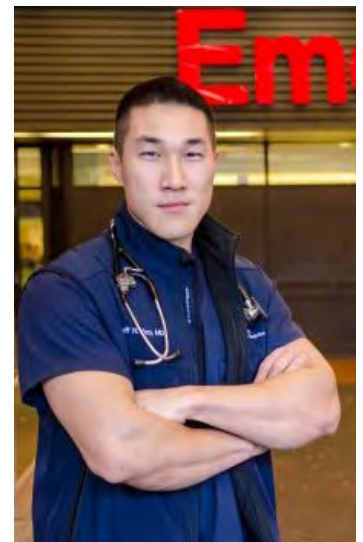
Publications continued...

21. **Ho K**, Al-Shorjabji N, Brown E, Zelmer J, Gabor N, Maeder A, Marcelo A, Ritz D, Messina L, Loyola M, Abbott P, Nazira J, McKinnon A, Dissanayake V, Akeel A, Gardner N, Doyle T. Applying the Resilient Health System Framework for Universal Health Coverage. *Stud Health Technol Inform*. 2016; 231:54-62.
22. **Ho K**, Borycki E, Kushniruk A, Juhra C, Hernandez M. The health perspective in using digital media for health and wellness. *Digital Media Industry & Academic Forum (DMIAF)*. 2016: 29-31.
23. Hernandez M, Juhra C, Kushniruk A, Borycki E, **Ho K**. Innovations and technologies for health and wellness. *DMIAF*. 2016: 37-39.
24. Hoffman RS, Hexdall A, Garvie A, Greenblatt B, **Brubacher JR**, Howland MA. Endogenous Digitalis-like factors in hypothermic patients. *Gen Internal Med Clin Innov* 2: 2016.
25. Juhra C, Hernandez M, **Ho K**, Kushniruk A, Borycki E. The health policy guidance & practice of introducing tech in health system in Europe. *DMIAF*. 2016: 35-36.
26. **Kim DJ**, Byyny RL, Rice CA, Faragher JP, Nordenholz KE, Haukoos JS, Liao MM, Kendall JL. Test characteristics of emergency physician-performed limited compression US for lower extremity deep vein thrombosis. *J of EM* 2016; 51(6): 684-90.
27. **Kim DJ**. Enhance the valsalva to (actually) terminate SVT. *UBC Continuing Professional Development: This Changed My Practice*; 2016.
28. Karpov A, Parcerro C, Mok C, Panditha C, Yu E, Dempster L, **Hohl CM**. Performance of trigger tools in identifying adverse drug events in ED patients: a validation study. *Br J Clin Pharmacol* 2016 Oct;82(4):1048-57.
29. Khan M, Sivilotti ML, Bullard MJ, Emond M, Sutherland J, Worster A, **Hohl CM**, Lee JS, Eisenhauer M, Pauls M, Lesiuk H, Wells GA, Stiell IG, Perry JJ. Factors influencing time to CT in ED patients with suspected SAH. *J of EM (In Press)*.
30. Kushniruk A, Borycki E, Juhra C, Hernandez M, **Ho, K**. The human-computer user interface and patient safety: Introducing new technologies in healthcare effectively and safely. *DMIAF*. 2016: 32-34.
31. Leadbeater BJ, Ames ME, Sukhawathanakul MA, Fyfe M, Stanwick R, **Brubacher JR**. Frequent Marijuana Use and Driving Risk Behaviors in Canadian Youth. *Paediatrics & Child Health (In Press)*.
32. McKeown S, Krause C, Shergill M, Siu A, **Sweet D**. Gamification as a strategy to engage and motivate clinicians to improve care. 2016.
33. Petrie D, Chopra A, Chochinov A, Artz JD, Schull M, **Tallon JM**, Jones G, MacPhee S, Ackerman M, Stiell IG, Christenson J. CAEP 2015 Academic Symposium: Recommendations for University Governance and Administration for EM. *CJEM* 2016 Apr 5:1-8.
34. Peddie D, Small SS, Badke K, Wickham ME, Bailey C, Chruscicki A, Balka E, **Hohl CM**. Designing an adverse drug event reporting system to prevent unintentional reexposures to harmful drugs: study protocol for a multiple methods design. *JMIR Res Protoc* 2016 Aug 18; 5(3):e169.
35. Prager R, McCallum J, **Kim D**, Neitzel A. Point-of-care US in undergraduate medical education: a survey of UBC med student attitudes. *UBCMJ* 2016; 7.2: 12-16.



Dr. Ka Wai Cheung
Smoking Cessation &
TIA Study

*The airway registry
project aims to
improve airway
management at VGH*



Dr. Jeff Yoo
Airway Registry

Publications continued...



Amber Cragg
ADE Study

36. Singal R, Singal D, **Bednarczyk J** et al. Current and Future Status of Extracorporeal CPR for In-Hospital Cardiac Arrest. *CJC* 33 (2017) 51-60.
37. Stringer CEA, Ahn JS, **Kim DJ**. Asteroid hyalosis: a mimic of vitreous hemorrhage on point of care ultrasound. *CJEM* 2016.
38. Scheuermeyer F, Grunau B, Cheyne J, Grafstein E, Christenson J, **Ho K**. Speed and accuracy of mobile Blackberry Messenger to transmit chest radiography images from a small community ED to a geographically remote referral center. *J Telemed Telecare*. 2016; 22(4):244-51.
39. Scheuermeyer FX, Grunau BE, Findlay T, Grafstein E, Christenson J, Lang E, Rowe B, **Ho K**. Speed & accuracy of test-mtg ED ECGs from a small community hospital to a provincial referral center. *J Telemed Telecare*. 2016; 22(2):105-13.
40. Silverberg ND, Iverson GL, **Brubacher JR**, Holland E, Hoshina LC, Aquino A, Lange RT. The nature and clinical significance of pre-injury recall bias following mild TBI. *J Head Trauma Rehabilitation*. 2016; 31:388-396.
41. Silverberg ND, Panenka W, Iverson G, **Brubacher JR**, Shewchuk JR, Heran MKS, Oh GCS, Honer WG, Lange RT. Alcohol Consumption does not Impede Recovery from Mild to Moderate TBI. *Silverberg, JINS* 2016; 22:816-27
42. Taylor JA, **Hohl CM**. Delayed sequence intubation: is it ready for prime time? *CJEM*. 2016 Feb 25:1-3.
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.
44. **Vu EN**, Schlamp RS, Wand RT, Kleine-Deters GA, Vu MP, Tallon JM. Prehospital use of TXA for hemorrhagic shock in primary and secondary air medical evacuation. *Air Med J*. 2013 Sep-Oct; 32(5):289-92.
45. Wang J, Patten SB, Lam RW, Attridge M, **Ho K**, Schmitz N, Marchand A, Lashewicz BM. The Effects of an E-Mental Health Program and Job Coaching on the Risk of Major Depression and Productivity in Canadian Male Workers: Protocol for a RCT. *JMIR Res Protoc* 2016;5(4):e218.
46. Wettlaufer A, Florica RO, Asbridge M, Beirness D, **Brubacher JR**, Callaghan R, Fischer B, Gmel G, Imtiaz S, Mann RE, McKiernan A, Rehm J. Estimating the harms and costs of cannabis-attributable collisions in the Canadian provinces. *Drug and Alcohol Dependence* (In press).

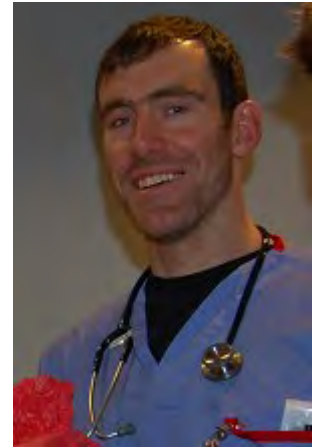
Dr. David Sweet's Blood Culture Study is working to optimize the treatment of patients with severe sepsis

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

1. Ackerley CA, **Hohl CM**, Balka E. What goes unsaid? Critical discourse analysis of stakeholders' communication in an integrated knowledge translation project. Canadian Knowledge Mobilization Forum. Toronto.
2. Bhyat, Rashaad (with contributions from **Ho K.** on the abstract). "Advancing digital health in medical education - Influencing change and training the trainers." Presented at ICRE 2016 conference. Niagara Falls.
3. **Brubacher JR**. Drug Impaired Driving. RCMP forensic toxicologists. Vancouver.
4. **Brubacher JR**. Drug Impaired Driving. Centre for Clinical Epidemiology and Evaluation (C2E2) rounds. Vancouver.
5. **Brubacher JR**. Cannabis legalization and road safety. BC Association of Chiefs of Police (BCACP), Traffic safety committee. Richmond.
6. **Brubacher JR**. Cannabis and Motor Vehicle Crashes: Preliminary Results. 2016 BC Road Safety Strategy Conference. Vancouver.
7. **Brubacher JR**. Police are unable to recognize drug use in injured drivers. 8th Annual Emergency Medicine Research Day. Vancouver.
8. Cordeiro J, Novak Lauscher H, Bar S, **Ho K.** e-Patient in BC: Building eHealth Capacity through Public Participation. eHealth 2016: Reimagining Healthcare Delivery in Canada conference. Vancouver.
9. Chan M, Cordeiro J, Novak Lauscher H, **Ho K.** Improving Patient Experience During the ED Journey: Is There an App for That? UBC Dept of EM Research Day. Vancouver.
10. D'Souza K, Henningham L, Zou R, Huang J, O'Sullivan L, Last J, and **Ho K.** Health professional educators' attitudes to using social media as a teaching tool. Interdisciplinary Student Health Conference, UBC Southern Medical Program. Kelowna.
11. D'Souza K, Henningham L, Zou R, Huang J, O'Sullivan L, Last J, and **Ho K.** Health professional educators' attitudes to using social media as a teaching tool. 2016 Western Student and Resident Medical Research Forum. Carmel, CA.
12. D'Souza K, Henningham L, Zou R, Huang J, O'Sullivan L, Last J, and **Ho K.** Health professional educators' attitudes to using social media as a teaching tool. Interdisciplinary Student Health Conference, UBC Southern Medical Program. Kelowna.
13. D'Souza K, Henningham L, Zou R, Huang J, O'Sullivan L, Last J, and **Ho K.** Health professional educators' attitudes to using social media as a teaching tool. Universities 21 Health Sciences Meeting. Santiago, Chile.
14. Gheorghiu B, **Ho K**, Lester R, Kaan A. Use of Innovative Consumer Health Solutions to Manage Chronic Disease. Panel Presentation at eHealth 2016: Reimagining Healthcare Delivery in Canada conference. Vancouver.
15. **Hohl CM**, Partovi N, Ghement I, Wickham ME, McGrail K, Reddekopp LN, Sobolev BG. Impact of pharmacist-led medication review in the emergency department on downstream health services utilization. CAEP 2016 Conference. Quebec City.
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.
17. **Hohl CM**, Badke K, Zhao A, Wickham ME, Sivilotti MLA, Perry JJ. Prospective validation of clinical decision rules to identify ED patients at high-risk of adverse drug events. CAPT Conference. Toronto.
18. **Hohl CM**, Partovi N, Ghement I, Wickham ME, McGrail K, Reddekopp LN, Sobolev



Dr. Jan Trojanowski
Airway Registry

Dr. Donna Lee is developing a "flipped classroom" approach for ultrasound training



Dr. Donna Lee
Ultrasound Education



Kelly Soros
Med Student
FLEX Program, UBC

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



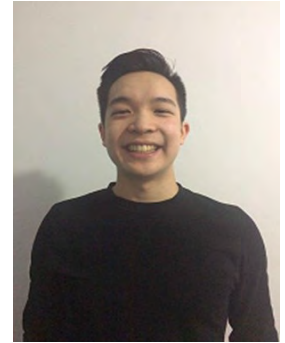
Cherry Lam
Med. Student Volunteer
U of St Andrews

Presentations continued...

- BG. Impact of early in-hospital medication review by clinical pharmacists on health services utilization. Cdn Assoc for Population Therapeutics (CAPT) Conf. Toronto.
19. **Ho K**, Novak Lauscher H, Newton L, Boothe A. Mobile digital access to a web-enhanced network (mDAWN): mHealth for type-2 diabetes self-management and implications for emergency medicine. CAEP 2016: Gateway to Learning. Quebec City.
 20. **Ho K, Kim Sing C**. TEC4Home: A Multicentre Program for e-Home Health Monitoring of Patients Discharged From the ED. UBC Dept of EM Research Day. Vancouver.
 21. **Ho K**, Li J, Jang K, Robertson G. Trans-Pacific e-mental wellness synergy: the Vancouver-Guangzhou experience. e-Mental Health Int Conf. U of Newcastle, Australia.
 22. **Ho K**. Applying the resilient health system framework to attain universal health coverage through digital health in the age of sustainable development goals. Global Telehealth/Health Informatics New Zealand 2016. Auckland.
 23. **Ho K**. Emergency Department Patient Assessment Scale using Sensors (EDPASS). ITEA 3 Project Outline Preparation Days 2016. Paris, France.
 24. **Ho K**, Borycki E, Kushniruk A, Juhra C, Hernandez. The health perspective in using digital media for health and wellness. DMIAF 2016. Santorini, Greece.
 25. Hernandez M, Juhra C, Kushniruk A, Borycki E, **Ho K**. Innovations and technologies for health and wellness. DMIAF 2016. Santorini, Greece.
 26. Inskip J, Novak-Lauscher H, Li L, Ansermino M, Dumont G, Garde A, **Ho K**, Hoens, A., Road, J., Ryerson, C.J., Camp, P.G. Conceptualizing Pulmonary Telerehab with Healthcare Pros. American Thoracic Society 2016 IntConf. San Francisco, CA.
 27. Inskip J, Novak-Lauscher H, Li L, Ansermino M, Dumont G, Garde A, **Ho K**, Hoens A, Road J, Ryerson CJ, Camp PG. Patient Perspectives on Pulmonary Rehabilitation Using Telehealth. American Thoracic Society 2016 IntConf. San Francisco, CA.
 28. Juhra C, Born J, **Ho K**, Kushniruk AW, Mamuzic J, Wohlmann J, Borycki EM. Emergency data management from an international perspective: concept, practice, lessons learned and way forward. HEC 2016 Med Inform Europe – MIE 2016. Munich, Germany.
 29. Juhra C, Nielaender J, Hernandez M, **Ho K**, Kushniruk A, Borycki E. The health policy guidance & practice of introducing techs in health system in Europe. DMIAF 2016. Santorini, Greece.
 30. Kaitlin A, Anne-Marie J, Elizabeth S, Novak Lauscher H, **Ho K**. A Coming Together of Health Systems: First Nations Trad'l Practitioners in Acute Care Settings. 2016 Rural Health Services Research Conference & Multimedia presentation at the Fourth Global Symposium on Health System Research.
 31. Kushniruk A, Borycki E, Juhra C, Hernandez M, **Ho K**. The human-computer user interface and patient safety: introducing new techs in healthcare effectively and safely. DMIAF 2016. Santorini, Greece.
 32. **Purssell RA**. The Toxicology of Fentanyl: First Responders Provincial Meeting: Department of National Defense. Victoria.
 33. **Purssell RA**. BC Probis Soc Lec: Road Safety Policy: Inj Impaired Drivers. Vancouver.
 34. **Purssell RA**. Advanced Hazard Life Support: Dept of National Defense. Vancouver.
 35. **Purssell RA**. BC Patient Safety Council/UBC Dept of EM Webinar: The Fentanyl Epidemic: What we need to know. Vancouver.

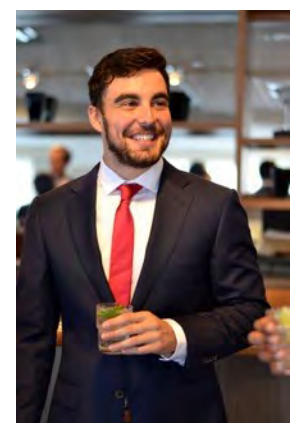
Presentations continued...

36. **Pursell RA.** Genetic Determinants of Cocaine-Associated Agranulocytosis: 8th Annual EM Research Day. Vancouver.
37. **Pursell RA.** Primer: Management of Opioid Overdose Patients: First Responders and ED Personnel: Best Brains Exchange Opioid Overdose Crisis. Vancouver.
38. Small SS, Peddie D, Badke K, Wickham ME, Bailey C, Chruscicki A, Balka E, **Hohl CM.** Designing an adverse drug event reporting system to prevent unintentional re-exposures to harmful drugs. Simon Fraser University Health Research Day. Vancouver.
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.
45. **Sweet D.** Sepsis Update-Burning up over you. SPH Whistler EM Conference, Whistler Conf. Center. Whistler.
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).
49. **Sweet D.** A Clinician-Led Quality Initiative- Enhancing Inpatient Sepsis Care. Quality Forum. Vancouver.
50. Tran W, Zhuang M, **Ho K.** Development of a Medical Mandarin Workshop for Medical Students, UBC Faculty of Medicine. Vancouver.
51. Tran W, Zhuang M, & **Ho K.** Development of a medical Mandarin workshop for medical students. Students in Health Annual Research Conference. 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 JL, **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.
54. Zhang M, Ho R, Chan S, **Ho K.** eHealth and psychiatry. International Congress of Psychiatry 2016. Hong Kong, China.



Ryan Yip
Study Volunteer
U of Ottawa

Quality Research in the ED? Our research program was featured in the VCH News (vchnews.ca/news)



Alex Trajkovski
Med Student Volunteer
Queens U

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 Pursell	(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 Pursell, 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.

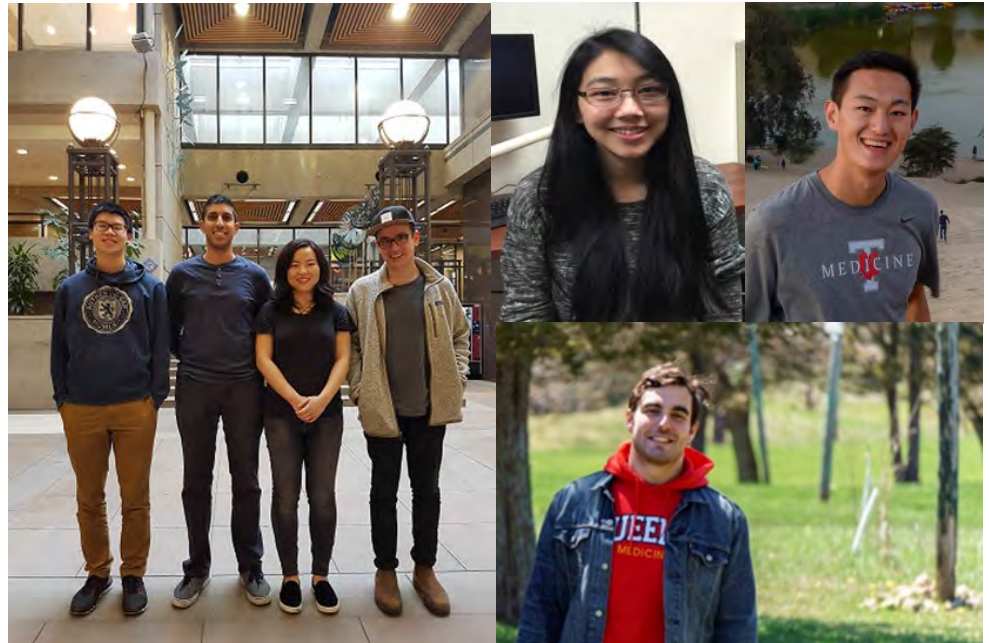


Student Involvement

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



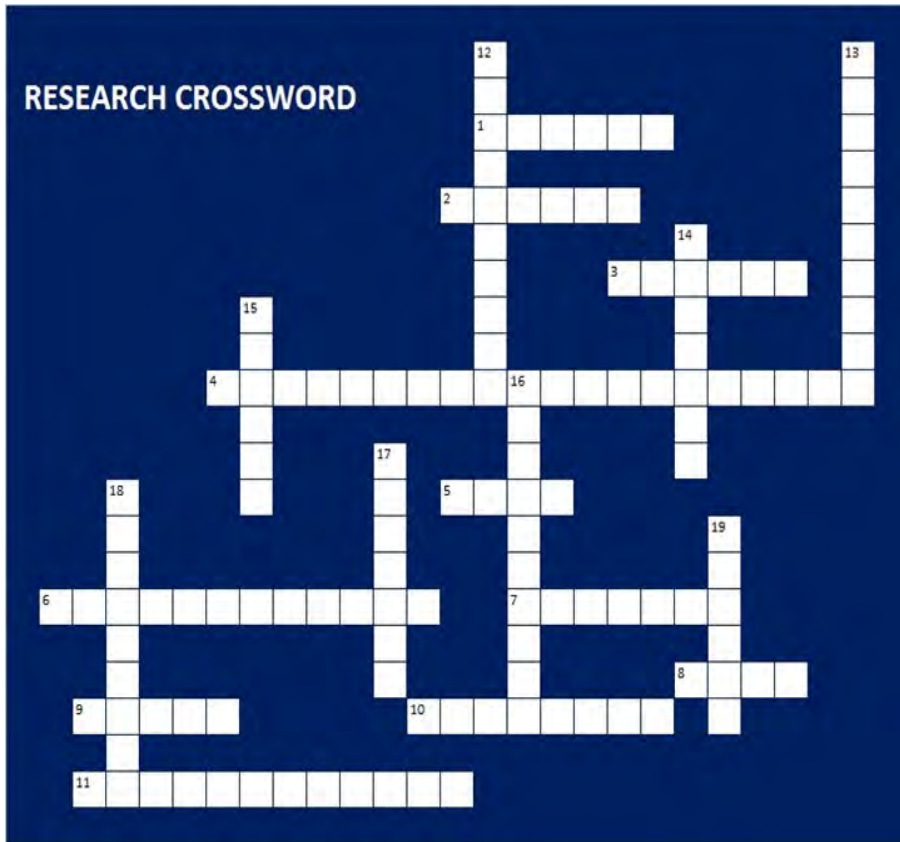
WorkLearn Student

Shivani Wells

Study Volunteers

Amanda Lee
Ryan Yip

Research Crossword



Across

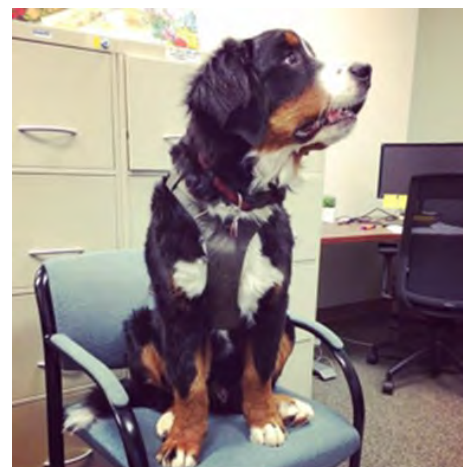
1. _____ Registry—study led by Dr. Jeff Yoo
2. Blood infection
3. Fentanyl is a type of _____
4. TBI expanded
5. “Tech4 _____”
6. Most common arrhythmia presentation in the ED; Atrial “_____”
7. One of the co-PIs for clue number 4
8. PI for the ADE study
9. Common treatment for irregular heart beats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