

ANNUAL REPORT 2016



DEPARTMENT OF EMERGENCY MEDICINE CALGARY ZONE

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Executive Summary



Dr. Eddy S. Lang, MD
Clinical Department Head
Calgary Zone

The Calgary Department of Emergency Medicine experienced what was both a very challenging and exciting/successful year in 2016. While I wish I could begin with the positives, the unprecedented degree of inpatient boarding that the Zone witnessed this year has contributed to a reduced ability to provide quality patient care and has taken a toll on both nurses and physicians in the Zone. On a number of occasions in 2016, emergency departments in Calgary were holding more admitted patients than they had stretcher capacity, usually designated to evaluating new incoming patients arriving by EMS. These situations cause the department to grind to a halt and create unsafe working conditions and make the 90 by 90 target hopelessly unattainable. Fortunately, the department feels supported and is working closely to address these issues within current constraints in the hopes of revamping the Zone's Overcapacity Protocols such that risk is distributed evenly across the system and that we

eliminate quotas in relation to surge admissions to inpatient units. Emergency Departments thrive on serving as the safety net for all Calgarians in urgent need of medical attention or in social crisis, we cannot also serve as the safety valve for an excess in inpatient demand.

While the operational demands on Calgary's Department of Emergency Medicine increased in 2016 as reflected by more ED visits, more EMS transports, more patients requiring admission and more frail elderly presenting to the ED, the performance metrics that reflect EM clinical care remained stable or even improved in 2016 and remain favorable in comparison to other comparable sites in the province.

On all other fronts the Calgary Department is thriving and growing. Chief among the accomplishments of 2016 are the establishment of the Section of Clinical Pharmacology and Toxicology in April under the leadership of Dr. Mark Yarema and the anticipated future Royal College Fellowship Director, Dr. Scott Lucyk. We were also pleased to cross-appoint all of the academic leaders in Pediatric Emergency Medicine at the Alberta Children's Hospital fostering further collaboration and partnerships. Academic Medicine Framework activity absorbed a significant amount of departmental leadership efforts but with good success being among a few existing non-AARP departments invited to proceed to next steps in round two of the provincial development process. Progress is also underway in establishing a physician partnership strategy through Compact methodologies discussed early in the year at an AHS leadership retreat.

Under the leadership of Dr. Ian Walker, Calgary Zone Emergency Physicians voted overwhelmingly to support the creation of the Physician Support Fund. Physicians contribute annually to a program that has local physician oversight and accepts proposals for initiatives that will improve care delivery and or working conditions in the Calgary Zone.

The year also saw the most successful Clinician Gala Award night yet. With over 200 in attendance, much deserved recognition was bestowed on a number of early career and established physicians in the Calgary Zone.

Our academic program continues to thrive on the research and educational fronts. Efforts to establish a clinical pathway that mitigates the over-utilization has been successfully implemented and evaluated by

Dr. Grant Innes and his team yielding an important reduction in CT imaging for suspected renal colic. The program in health services research continues to seek out operational efficiencies and more rational utilization of resources through the PRIHS I and PRIHS II programs and our newly funded involvement in a PRIHS III project. These projects being led by Drs. Gabriel Fabreau, Van Nguyen and Kerry McBrien will ensure improved care for the vulnerable and under-served patients who frequent the ED. Research activity continues to ramp up as demonstrated by a jam-packed Research Day and a growing number of peer-reviewed publications led by the Department.

Educational programs continue to shine from the Clerkship level under the leadership and support of Trevor Langan who completed his 10th and final year of service as Clerkship Director through to our PGME and off-service electives program.

Calgary, despite the capacity pressures that are a threat to the clinical mission remains one of the most sought after places to provide high quality emergency care in Canada and beyond.

Calgary EIP Summary

Date: 17-Jan-17

Time: 0530 hrs

CALGARY HOSPITALS	# EIPs TOTAL	# EIPs Assigned Beds	Number of Funded spaces	% Occupied
FMC	41	0	54	76%
RGH	14	1	50	28%
PLC	38	0	34	112%
ACH	3	0	30	10%
SHC	31	0	30	103%
Total	127	1	198	64%
EDMONTON HOSPITALS				
GNCH	25	0	26	96%
MCH	17	0	26	65%
UAH/MAHI	21	5	51	41%
Stollery	2	1	24	8%
RAH	10	0	55	18%
SCH	21	0	26	81%
Total	96	6	208	46%

Note:

All data is collected from REPAC

EIP Total - Total number of EIP's including EIP's with Assigned Beds

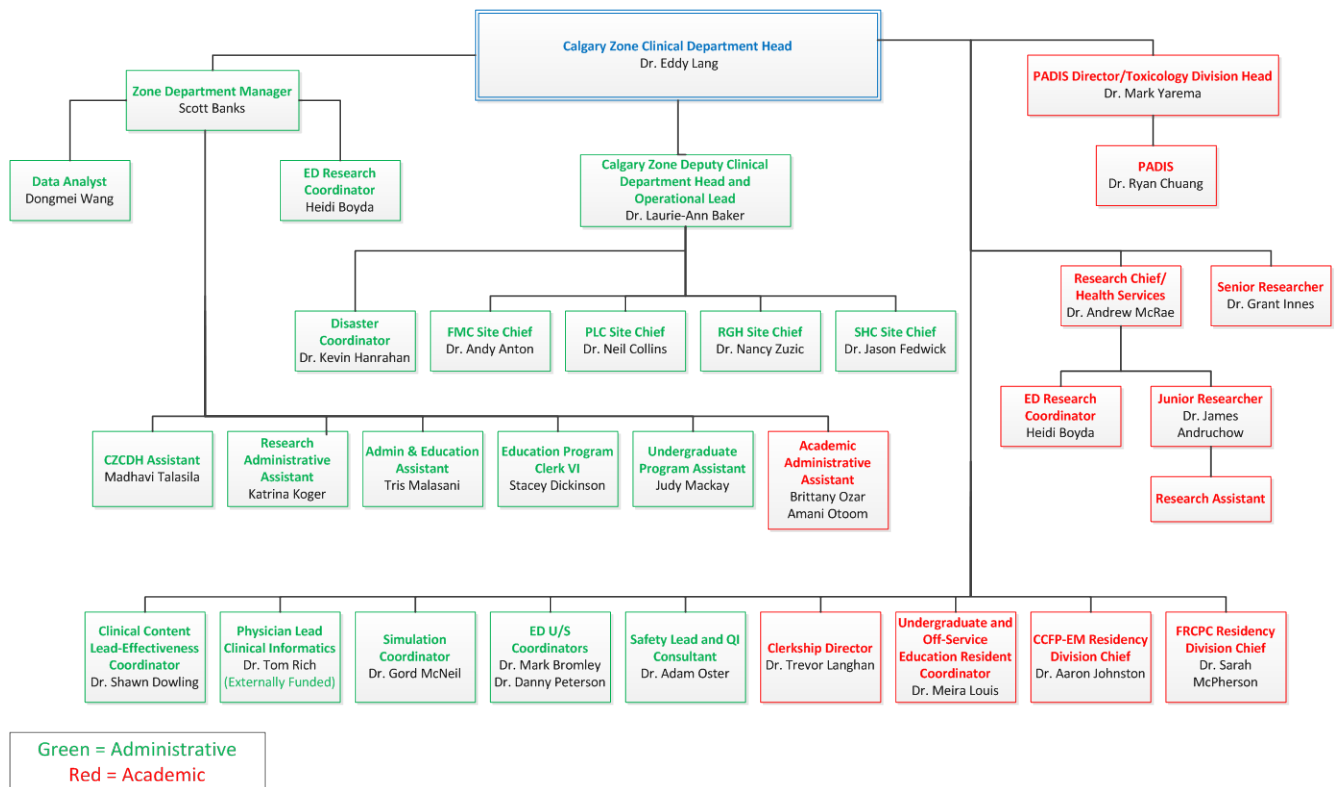
EIP's Assigned - number of EIP's with inpatient beds assigned (attended)

Emergency Medicine Department Operations

Departmental Structure and Organization

Governance: Physician leads within the Department of Emergency Medicine include a Department Head (Eddy Lang), a Deputy Department Head & Operations Lead (Laurie Ann Baker), a Site Chief at each hospital (RGH – Nancy Zuzic; PLC – Neil Collins, SHC – Jason Fedwick, and FMC – Andy Anton, Royal College Residency Directors (Sarah McPherson & Marc Francis), CCFP-EM Residency Director (Aaron Johnston), a Clerkship Director (Trevor Langan), Director of Off Service Resident Education and Undergraduate Education (Meira Louis), Senior Researcher (Dr. Grant Innes), Research Director (Andrew McRae), Junior Researcher (James Andruchow), ED Ultrasound Coordinators (Mark Bromley, Danny Pederson), Simulation Coordinator (Gord McNeil), an Informatics Lead (Tom Rich) an Effectiveness Coordinator (Shawn Dowling), a Quality Improvement & safety Lead (Adam Oster) a Disaster Planning Coordinator (Kevin Hanrahan) and a new Department Section Chief of Toxicology (Mark Yarema). Scott Banks, our Department Manager, oversees budget, physician recruitment and management.

Departmental of Emergency Medicine Functional Organization



EM Committees

Seven main DEM committees meet monthly or bi-monthly.

The Physician Executive Committee:

The Physician Executive Committee provides leadership, direction and support for all physician-related activities. The Committee is a decision-making body for physician manpower, scheduling, operational, quality, safety and financial aspects of the Zone Department of Emergency Medicine (ZDEM).

The ZDEM Operations Committee:

The Operations Committee is a multi-disciplinary committee including Physician, Nursing and administrative representatives. Duties include strategic planning, prioritization, quality, safety, innovation and oversight of all ED systems and processes.

The Academic Steering Committee:

The Academic Steering Committee guides the development of the EM academic program. Primary agenda items for the 2016 year included strategic planning towards short term and long-term academic goals, faculty development, recruitment to academic positions and educational programming.

The Promotions Committee:

This committee processes faculty appointments and promotion requests for the new Academic Department of Emergency Medicine.

The ZDEM Physician Manpower Committee:

The Physician Manpower Committee is a subcommittee of the Physician Executive Committee. It provides leadership and makes decisions with respect to manpower needs, search and selection, and physician hiring in the Department of Emergency Medicine.

The Quality Assurance Committee:

This committee reports to the ZDEM Operations Committee. It is one of the few departmental QAC's that have been allowed to continue within the new AHS Safety framework.

The Calgary Physician Support Fund Oversight Committee:

This committee is comprised of 6 emergency physicians who oversee a fund that was set up in 2016 to support education, research and development in the Calgary Emergency Department. Funding for this committee is provided exclusively by emergency physicians who have agreed to support the fund. The average emergency physician contributes \$1,800 annually to this fund.

Department Membership

The Department of Emergency Medicine currently employs 180 plus active physician staff and treats approximately 310,000 patient visits per year (annualized value based on current and projected inflow volumes).

Historically there were two main “practice-groups” (The Foothills-PLC group and the Rocky view group), but an increasingly zone focus and multi-site practice has changed this model. We now have extensive physician cross-coverage of sites, with a variety of site combinations. Currently all of our Emergency Medicine physicians have academic appointments.

Manpower and Workforce Planning

Highlight of the Year: MD Recruitment and Hiring



Dr. Laurie-Ann Baker, MD
Deputy Department Head,
Operational Lead
Calgary Zone

The year 2016 was once again a very active recruitment year for the Calgary Zone Emergency Department. Twelve new physicians started work in the Emergency Department in 2016 and another 13 physicians are being recruited to start work in the Calgary Zone Emergency Department in 2017. We completed a very aggressive recruitment campaign to improve our emergency physician staffing levels and we anticipate that in 2017 we will be significantly winding down our recruitment efforts and returning to more moderate recruitment strategies with an increased focus on physician retention.

Our Calgary Zone Emergency Department is now one of, if not the largest, Emergency Departments in Canada with approximately 180 emergency physicians and locums on staff. Despite our successes, we remain very diligent with our recruitment efforts. Dr. Laurie Ann Baker our Deputy Department Head & Operations Lead, completed extensive surveys of our physician group in order to plan for future manpower needs, improved retention strategies and evaluate

overall wellness of the physician group. To account for continued growth within the city and both planned and unplanned attrition, we are anticipating that we will need to hire approximately three to four emergency physicians per year over the next 3 years. Given our recruitment success over the past few years, we are very confident that we will be able to achieve this goal. It is, however, critical that we continue to develop new and innovative ways to differentiate our department so that we can continue to recruit Canada's best and brightest emergency physicians. New recruits will not only need to be exceptional clinicians they must also offer strong extra-clinical skills as well.

The Recruitment Process



Scott H. Banks, MBA, CITP, CHRP
Emergency Medicine Zone Department
Manager & Co-Chair Physician Manpower

To attract applicants from our target market, in 2016 we ran online advertisements in the Canadian Journal of Emergency Medicine (CJEM), published advertisements in the Canadian Medical Association Journal (CMAJ), and used online websites such as CMA careers. Advertisements also appeared throughout the year in the CAEP Communiqué, a bi-weekly newsletter that is emailed to over 1,500 emergency physicians in Canada.

In previous years we recruited by setting up an exhibitor booth at the annual Canadian Association of Emergency Physicians conference but now that we are winding down our recruitment efforts this is no longer necessary. We work closely with emergency medicine Residency Directors across Canada to recruit residents interested in moving to Calgary. With a strong involvement at CAEP, many physicians from other provinces contact us. Calgary has now

become a premier destination for emergency physicians to seek employment at the conclusion of their residencies. As a result, we do not anticipate the need to set up a recruitment booth at CAEP 2017 as

we are currently getting far more applicants than positions available. This is an extremely favourable position for our Department to be in.

Leading Edge Recruiting Practices

Our Selection Committee tends to be small and has the ability to invite applicants to Calgary quickly after their application file is complete. Exceptional candidates with very good references are provided employment contracts within 24 to 48 hours of their interviews. We believe this expedited process has increased our success rate substantially, as it makes candidates feel highly sought after. Most high quality candidates interview at multiple sites across the country, and most potential employers (EDs) take days or weeks after the interview to make hiring decisions and extend job offers. By making immediate or rapid offers, we are demonstrating to candidates that we are decisive, well prepared, capable of getting things done, and serious about hiring them. These are characteristics that our recruits have indicated that they find appealing. Recruitment Is Important – But retention is equally as Important:

Retention Strategies

To ensure that we maintain a core of experienced EM physicians who can provide mentorship to our new recruits, the manpower committee has adapted its philosophy to focus on the active retention of this important physician group. Retention strategies that have been implemented recently include the option of removing night shifts from regular clinical rotations for those individuals aged 55 years or older and have worked in our department for a minimum of 10 years. For those physicians who qualify for this exclusion but choose to continue to work night shifts, they are offered extended time off during the summer vacation blocks in lieu. Other strategies for some of our older physicians have successfully included the tempering of shift types to support changing practices as they begin to plan for retirement while still maintaining their clinical competence.

For the past three years the Department of Emergency Medicine has held a sold out gala and awards night to recognize individuals with outstanding clinical skills and achievements. These awards included overall clinical excellence, humanitarian, lifelong learning as well as outstanding rookie awards for those physicians who have excelled in their first two years of practice. The success of the evening, that includes attendance of EM physicians and their significant others from all four adult sites as well as Alberta Children's Hospital, is overwhelming and as a result we will continue to offer this very successful event on an annual basis.

Goals and Strategies

Our underlying primary goal is to provide safe and efficient care to all patients that present to a Calgary Zone Emergency Department. We have increased manpower and continue to modify ED shift schedules so that we can better match physician capacity to patient demand. This requires ongoing reassessment of demand but it is also dependent on modifying operations so that added physicians are actually effective (i.e. able to examine patients in care spaces). Our "Surge Strategy" takes effect when patient demand exceeds physician manpower and a minimum number of assessment spaces are available, the departments proceed with a physician call out to assist in the department. This strategy has had some success and we anticipate that it will continue to be better utilized in 2017.

The increased number of admitted patients remaining in the ED because of a shortage of available inpatient beds in 2016 in the Calgary Zone, has been extremely challenging and has crippled many of our previously successful ED and in patient process changes, i.e. Creation of Intake area in all adult ED's; Over Capacity Plan (OCP) triggering and implementation to name a few.

ED overcrowding is not the root of the current crisis rather it is the result of the limited number of available inpatient beds stemming primarily from the province's shortage of long term care beds. Although AHS and the province of Alberta continue to try and find measures to improve access, until more acute care and long term beds are created, we anticipate the situation will worsen over the coming year.

Impact on Other Departments and AHS Resources

Hiring large numbers of ED physicians has an impact on the provincial physician budget (payments are fee for service billings through the Physician Services Branch), but minimal impact on other Calgary Departments and the CMO (Physicians Affairs) budget, as the physicians are fee for service workers increasing in response to growing patient demand. We have required and will continue to require some additional financial resources for ongoing advertising and physician recruitment until this active initiative winds down in June 2017.

Patient Safety and Quality Improvement Report 2016

These are some of the current activities going on in the QI/QA area:

1. **Minor ED Working Group** — examining the selection and throughput of patients in this area to ensure patient safety, patient appropriateness and workflow efficiency.
2. **Unidentified Patient Working Group** — goal to improve the current unidentified patient numbering system to enhance patient safety.
3. **Difficult Airway Working Group** — multi-disciplinary, multi-site group to arrive at a consensus and best practice process to guide management of the patient with deteriorating anticipated difficult airway or the unanticipated difficult airway. Dr Bryan Webber is the Chair of this WG.
4. **Handover Project** — please submit your Handover Survey for every handover at some point following receipt of the handover. There is a free text for comments in the Survey as well.
5. **EMS Park Working Group** — ongoing work to address the risk of patients in EMS Park.
6. **Resuscitation Working Group** — will select areas in cardiac resuscitation care delivery for potential process improvements.
7. **Patient Safety Reviews** — at present we have a number of new reviews starting — thank you to those that have offered to assist with these.
8. **Reporting and Learning System** — please submit any patient safety event(s) through the RLS icon on the insite splash page.

Disaster Preparedness

- Review and refinement of ED/Hospital disaster plan along with nursing colleagues at all sites, E/DM, RAAPID and Medical Affairs. With several “near misses” in 2016, which did not result in adequate testing of our plans, this is a major part of the disaster portfolio work.
- Establishment of ED MD Disaster Working Group with representation from all sites. (Lendrum-FMC, Handel-PLC, Les-ACH (resigned at end of 2016 and replaced by Lendrum), Fagan-FMC, Rebus-SHC, Brulotte-RGH). This group is tasked with familiarization of site specific plans and brainstorming on changes to those plans as they affect physicians.
- Plan for merging RN and MD Disaster Planning groups in 2017 to better utilize the different perspectives and experience of both groups.
- Work continues on an effective Physician Fan Out process that utilizes the efficiency of modern technology while being sensitive to alleged privacy issues.
- March 2016 “severe weather” tabletop exercise PLC.
- April 2016 “Airdrie Active Shooter” exercise used to trigger a tabletop exercise at all sites focusing on communications and activation at the ED level.
- June 2016 “Airdrie Active Shooter” communications exercise expanded at FMC to involve hospital administration and other units.
- Dr’s Lendrum, Granberg and Hanrahan, in their capacity as Medical Directors and Logistics Chief’s worked on the ground beginning on day 2 of the Fort McMurray wildfires in May gaining valuable experience in assisting with management of a complex emergency.
- Resident “Disaster Day” unfortunately postponed after much work by Residents Granberg/Bateman due to above incident.
- The FMM event also spawned 2 papers to be presented at the World Association of Disaster and Emergency Medicine annual international conference in Toronto April 2017.
- Review and critique of site specific physical plant and supply set up for Code Orange events.
- UofC “Armed Assailant” tabletop exercise November alongside CPS, EMS, CFD, CEMA, RCMP and AHS-E/DM with a plan to have a full scale exercise stemming from this incident in June 2017 to include hospital resources.
- November presentation to the ZMAC to encourage generalization of the ED Code Orange planning process to other areas of Zone Medical Staff along with Dr Yael Moussadji.
- Involvement in Mass Gathering Provincial Planning group with E/DM, EMS, CEMA and public health in order to manage the risk that this presents to the emergency department.
- N95 physician compliance nearing 100% with a view to continuous recertification in this process.

- Actively pursuing training MD staff in more robust hazmat ppe training.
- Along with Brad Granberg created a Disaster Fellowship curriculum now offered through UofC and the Department of Emergency Medicine.
- Participation with Dr's Granberg and Lendrum in 4 day EMX16 (Annual Provincial Disaster Exercise) in Trochu, Alberta.

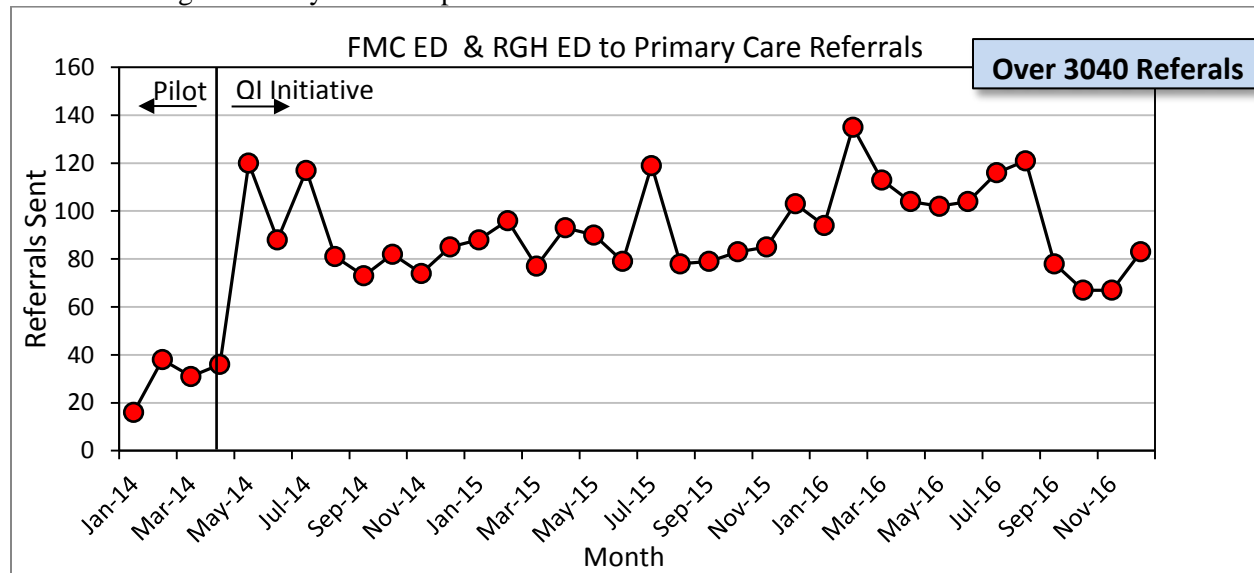
Calgary Zone Department to Primary Care Referral Project

Status

Over the 2016 calendar year the emergency department to primary care referral project was operational at three of the four acute care emergency departments (FMC, RGH, and SHC) with principal sites of activity being at the FMC and RGH hospitals and their associated PCN clinics. The CMO grant funded RN liaison position ended in December 2015 but process improvement continues thorough site-based Quality Improvement positions (as was always the case), a casual QI RN position supported through a limited primary care budget, as well as through insights and suggestions provided by PCN primary care partners.

Referrals

Information regarding referral volumes is summarized in the figure below. As can be seen, typical monthly combined referrals from the sites is between 80 – 100 patients. There have been over 3040 referrals during the three years of implementation.



Protocol Refinement

During the past year, two changes to the referral process were trialed and then incorporated into the protocol. While keeping patient safety at the forefront, the referral process was simplified by including language that permitted the referral to be made with a single RN assessment with the _option_ for a

second RN assessment. The protocol had previously required a second RN assessment. This process has been adopted at the RGH since June. Following implementation there was an immediate increase in the number of patients referred (27 in the month vs 15 the previous month) with no 'bounce-backs' since carrying out the change. The second refinement removed the requirement that the patient's stated pain level was not over 3 on a 0-10 pain scale. Instead the criterion regarding pain level now states that the pain must be within the expected range for the presenting complaint or chronic pain condition; the pain is consistent with a family practice sensitive condition and can be managed within a primary care setting; the patient is able to manage the pain with OTC medications or current prescription medications; the patient has a low risk history regarding the presenting complaint.

Innovative Variations

The emergency and diagnostic imaging departments at the Rockyview General Hospital together with Calgary West Central PCN's Primary Care Centre and a community imaging provider (RCA diagnostics) have developed a second successful variation on the ED to primary care referral initiative. Briefly, patients discharged from the ED requiring next day ultrasounds are booked with the community imaging partner and upon review by a radiologist are seen in a pre-booked follow up appointment at the PCN clinic. Only those individuals whose results show clinical "red flags" are directed to return to the ED for follow up. Results for 177 patients between Oct 2015 and Feb 2016 show that 92% were referred to the PCN. The new process was shown to be significantly quicker than returning to the ED for follow up and is now part of regular operations.

This second variation was preceded by an April 2015 variation in which patients treated in the RGH ED by a physician (i.e. not initially triaged by the RN protocol) who also required a non-urgent follow up, would be booked for an appointment in the same CWC Primary Care Centre. This process continued throughout 2016 and is active presently.

Presentations

- Ashley Murakami, Bryan Haggarty, Debbie Goulard, Mary Baines, Nancy Zuzic, Heather Hannaford, Peter Dickhoff, Sandra Hovey, Cheney Matthews, Christopher Cameron, Maya Grover (April 2016). *Integration of the Primary Care Network into the Community Ultrasound Referral Process for the Reduction of Repeat Visits to the Rockyview Emergency Department*. Poster presentation at the Western Emergency Department Operations Conference, Winnipeg, Manitoba.
- Presentations were also delivered by the RGH-CWC PCN group at the AHS ED research day (April 2016) and AHS Quality Summit (October 2016).

Further Interest & Opportunities

This work continues to garner interest from emergency departments and urgent care centres zonally, within the province and beyond. Documentation has been shared on request with a guiding principle that the work must be developed with review of the protocol to fit the local context. Keys to success remain the development of a trusted relationship between the hospital emergency department and the primary care setting supported through on-demand communication as well as scheduled check-ins and process reviews.

Calgary Emergency Physician Support Fund (PSF)

This fund has been initiated by members of the Department of Emergency Medicine region wide and involvement in the fund is voluntary. We have achieved over 90+% staff involvement / contribution to the fund. The fund will be overseen by a committee of emergency physicians that represent each of Calgary's different sites. The mandate of the fund is listed below:

Mandate:

1. To support initiatives brought forward to the committee by individual members or departmental leadership which are likely to improve the intellectual, clinical and/or working environment of emergency physicians practicing within the Calgary area
2. To provide top-up funding for the residency programs when appropriate other funding is not available. Both the Department of Emergency Medicine and the Physician Support Fund committee will continue to explore and advocate for appropriate level funding from the appropriate sources.

A request for applications from members of the fund has been made and the committee will be meeting in February to review and approve the appropriate applications. We will report back to our members yearly with periodic interim updates throughout the year on process changes if required.

Any questions regarding application and the process of application can be directed to any of the committee members.

Oversight Committee Members:

Chair: Rick Morris

Treasurer: Arun Abbi

Members: Andrew Fagan, Eileen Kabaroff, Heather Patterson, Marshall Ross

Secretary: Brittany Ozar

Mike Hodsman Memorial Lecture

The Mike Hodsman Memorial Lecture celebrates the life of our late colleague Dr. Mike Hodsman and his great love of learning. The second annual Mike Hodsman Memorial Lecture took place April 28, 2016 in the Foothills Auditorium. The planning committee chose a larger venue due to high attendance numbers at the 2015 lecture in the Coomb's theatre and the event was well attended by staff from many departments. Dr. Stefan Da Silva from the Dept. of Emergency Medicine introduced the morning with a case of a patient in cardiogenic shock who underwent ECMO and survived.

Dr Brian Grunau, emergency physician from St Paul's Hospital in Vancouver, was our featured speaker on e-CPR. Dr Grunau is leading an exciting clinical trial on the use of extracorporeal life support in cardiac arrest. Local speakers Dr Ken Parhar from Critical Care, Dr Rohan Lall from Trauma Surgery, and Dr William Kent from Cardiac Surgery described how ECMO is initiated and cases of critically ill patients in Calgary who have received this cutting edge intervention. The multidisciplinary audience of emergency physicians, nurses, paramedics, critical care physicians, cardiac and trauma surgeons left this full morning CME event curious and excited about the future of ECMO in Calgary.

A casual social and learning dinner event took place at Notable restaurant the evening before the main lecture where Dr Grunau presented his research on anaphylaxis.

The 2017 Mike Hodsman Memorial Lecture will feature Dr. Pat Croskerry an Emergency Physician from Dalhousie University and leading expert in clinical decision making, bias and medical error. With funding from the Department of Emergency Medicine and our local Emergency Medicine physician group through the Physician Support Fund the Mike Hodsman Memorial Lecture promises to continue to be an exciting annual lecture benefiting the Emergency Medicine community as well as physicians from many other specialties

Change in Emergency Physician Scheduling Software

The Calgary Zone Emergency Department has utilized Docroster Physician Scheduling Software for many years. At times our Department has had challenges with the software crashing and not being able to handle the very large volume of trades associated with our 175 plus emergency physicians. In mid-2016, we were notified by the company that now owns Docroster that it was going to be shut down and would be replaced with another similar product. We used this opportunity to test several other scheduling software programs, and we are happy to report that we have now signed on with **Medevision**.

Medevision is a physician scheduling software program designed and developed in Canada by a physician named Dr. Rob Horvath. Medevision allows for real time trades on smart phones, tablets, etc., and is a very customer focused product. Feedback thus far from our physician groups is very overwhelmingly positive, and we are excited about all the great options this new scheduling software offers to our Emergency Department.

Multidisciplinary Analgesia Working Group

The Calgary Zone Emergency Department Multidisciplinary Working Group continued to meet actively in 2016. With wide representation from Nursing, Pharmacy and Physicians our main activity was to support and evaluate order set changes as well as a sweeping change in policy and order set functionality related to bridging opioids for discharged patients. Opioid medications at discharge fell by over 90% as a result of the implemented changes. While this raised concerns over possible oligo-analgesia we are pleased to report no patient concerns that can be directly related to this change in practice. Furthermore, a survey administered to physicians with nearly a 50% response rate suggests that there is only minimal movement to codeine as a replacement analgesic and that most physicians report carrying triplicate prescription pads while on shift – a significant improvement in practice. Additionally through an extensive literature review supported by a pharmacy summer student we are moving to reduce ketorolac dosing from 30mg to 10mg for most indications as there is no analgesic advantage and only risks of toxicity.

Improving pediatric analgesia practices at the non-pediatric ED sites continues to be a major focus with an ongoing collaboration with QI leads Antonia Stang and Jennifer Thull-Freedman from the ACH – through a project funded by the CMO office in quality improvement. Additional emphasis is also being placed on the role that EDs can play in addressing the provincial crisis in regards to fentanyl overdoses and the implementation of naloxone take home kits in all Calgary EDs.

Respectfully submitted by Dr. Eddy Lang - Analgesia Committee Chair


New EMS Fellowship Beginning in 2017

Dr. Gary Mitchell, MB BaO BCh FACEM (Australia) will be joining the Calgary EM team in later 2017 while completing an EMS Fellowship. The fellowship includes: Core EMS educational courses (250hours), Clinical- 8 ED shifts/month + 100 hours pre-hospital shifts, Research - EMS research project (TBA), Administrative – TBA, Educational responsibilities - teaching, Simulation. Dr. Mitchell completed his undergraduate training at Queen's University Belfast, Northern Ireland. After completing his two foundation training years he moved to Australia where he worked in both Orthopaedics and Critical Care jobs before joining the Emergency Medicine Training program in 2011. During the five year training program he gained experience in Emergency Medicine, Anaesthetics, Intensive Care, Paediatric intensive Care, and Pre-hospital/Retrievals. He has now completed his Specialist training after recently passing his Fellowship of Australasian College of Emergency Medicine (FACEM) examinations and he has a keen interest in Critical Care, Pre-hospital, Sports Medicine and medical education. The entire Calgary Emergency Department is excited for his arrival and looks forward to working with him.


Special Visit and Rounds on Emergency Preparedness

We were pleased to host Dr. Daniel Barnett from the Johns Hopkins Bloomberg School of Public Health in 2016 for a series of presentations and rounds sharing his work in staff preparedness during a public health crisis.

[Thursday, October 20th 2016]



Please join us for morning Grand Rounds at 9:00am in
the FMC Coombs Theatre on
[Preparing for Emergent Public Health Crises](#)
Presented by special guest,
Dr. Daniel Barnett
from
Johns Hopkins Bloomberg School of Public Health



Dr. Daniel Barnett, MD, MPH, Associate Professor at Johns Hopkins Bloomberg School of Public Health. His research interests include evidence-based approaches to enhance public health emergency preparedness, response, and recovery systems. Dr. Barnett previously worked at Baltimore City Health Department's Office of Public Health Preparedness and Response, where he conducted disaster preparedness training activities for the department's workers.

**This event is brought to you by the Department of
Emergency Medicine and the Disaster Preparedness Team**

Please RSVP to Brittany at brittany.ozar@albertahealthservices.ca

Workshop Description:

An ever-broadening array of threats to public health and safety requires innovative and systematic planning approaches by healthcare leaders and their stakeholders. Daniel Barnett, MD, MPH, Associate Professor at Johns Hopkins Bloomberg School of Public Health, will conduct a workshop on October 20, 2016 in Calgary, on best practices for preparing for emergent public health crises of jurisdictional relevance. This workshop, designed for Calgary-area preparedness leadership, will include:

- A scenario contingency planning exercise, focusing on implications of surge capacity gaps in public health crises;
- An overview and exercise-based application of the Haddon Matrix, a systematic planning instrument for preparedness;
- Development of message maps for public health crisis risk communication planning.

The workshop will include interactive lecture and facilitated discussion; small-group breakout activities; and full-group brainstorming using these applied concepts.

Emergency Medicine Clinical Content/Effectiveness



Dr. Shawn Dowling, MD
EM Clinical Content Lead
Effectiveness Coordinator

As Over the last year a number of significant order set improvements have been implemented. We have prioritized order set creation and revisions to align with identified gaps in our current order set, evidence informed recommendations, resource stewardship and the provincial CKCM topics. The work highlighted here is a product of the Order Set team which includes IT (Kathy Yiu and team), Nursing (Alexis Mageau and team) and physician leads (Tom Rich, Shawn Dowling) and others.

From a new order set perspective, we have created the following order sets to address gaps identified by nursing and physicians: ED clostridium difficile, Post-Partum Hypertension, ED RN vag bleed, ED RN GI bleed/vag bleed/dyspnea, ED anemia. With 148 order sets, our priority is to maintain and optimize the current order set rather than creating a new order set unless a major gap is identified.

We also continue to update existing order sets to ensure the content is up-to-date, accurate and emphasizes care that is value added. We have begun the process of aligning our ED Order Sets with the provincial CKCM knowledge topics. Some of the topics have required very minimal changes to our order sets (for example ED chest pain) where other order sets have resulted in drastic order set changes (ED GI bleed) where we removed or de-emphasized items that are not evidence based, included clinical decision support (FMC GI bleed pathway). As with all CKCM topics, we include a link to the evidence within the order set to support specific recommendations. As a number CKCM topics continue to be produced over the upcoming years, we have developed a strong process and working relationship with their team. Their work leverages some of the content from our order sets and we then review their final product and update our order sets as needed.

One other area we have been focusing on over the last year is improving resource stewardship in the ED. The major initiatives on this front include reducing unnecessary investigations (PTT/INR, ECG's, modification of the EDRN miscellaneous order set), enhancing clinical decision support (GBS calculator and RBC transfusion thresholds, ED afib order set) and de-emphasizing/removing treatment options that are not value added as we modify and create our order sets. The biggest success has been the PTT/INR project which (at only partial implementation as of Aug 2016) had resulted in a reduction of over 30,233 PTT or INR in 9 months for a cost savings of 124,000\$. With the final order set changes having just been implemented and this project being scaled up to the inpatient service, the downstream impact of this project will be tremendous.

In the upcoming year, we plan to continue to address the specific Choosing Wisely Canada ED recommendations both within the order sets and within our ED group. We have also begun to assemble a **ED Value Added Care (EVAC)** committee that consists of physicians and nurses. The goal of this group is to identify low value care performed in the ED; while prioritizing, implementing and measuring the impact of the projects that are implemented.

Finally, the ED Physician Performance Reports underwent a significant change this year with the implementation of a static report distributed to physicians (instead of physicians needing to access the online dashboard). With this new report distribution mechanism, we took the opportunity to survey emergency physicians to determine the usefulness, usability and satisfaction with the reports. With a 28% response rate, 85% of physicians were satisfied or very satisfied with the reports (15% were neutral). Reliability and understandability of the reports were also consistent rated as useful/very useful. 88% of

physicians planned on taking action based on the report including self-reflection (91%) and modifying specific aspects of their practice (63%). Physicians felt that email distribution of reports Q6 months would be beneficial. Future initiatives include additional clinically relevant metrics, assessing whether the reports change performance and how to link “intention to change practice” to educational resources to assist physicians in achieving their desired practice change.

Emergency Medicine and Social Media

The past year has seen the development of the UCalgary EM website (cumming.ucalgary.ca/ermedicine), as well as the launch of a the @UCalgaryEM Twitter account.

Follow the UCalgaryEM Twitter account for details of departmental events as well as useful medical education links and sites. Other Calgary Twitter accounts to follow include Eddy Lang (@EddyLang1), Andrew McRae (@Andrew_McRae_EM), Nadim Lalani (@ermentor), Fareen Zaver (@fzaver), Chris Bond (@socmobem) Mark Yarema (@mcyarema), James Huffman (@jameslhuffman), Stephanie VandenBerg (@StephVDBG), Catherine Patocka (@patockaEM) and more.

The departmental website contains details of previous Grand Rounds as well as summaries of journal clubs for those who were unable to attend. There is also information on QPath, departmental ultrasound and clinical cases. There is also the resident website, Calgaryem.com, which contains helpful information for prospective students, residents and schedule information.

Based on the recent communications survey, there is some interest in developing a Calgary based podcast and definite interest in making Grand Rounds available by podcast or in summary form. If anyone is interested in helping with these initiatives, please contact me – Chris Bond

Social Media Publications 2016:

SGEM Hot Off the Press: Ultrasound during critical care simulation: a randomized crossover study. McKenna P, Thoma B, Milne K, **Bond C**. CJEM. 2016 Oct 26;1-5. PMID: 27781970

SGEM Hot Off the Press: Hypertonic saline in severe traumatic brain injury: a systematic review and meta-analysis of randomized controlled trials. Purdy E, Thoma B, Milne K, **Bond C**. CJEM. 2016 Sep;18(5):379-84. doi: 10.1017/cem.2016.374. PMID: 27618977

SGEM Hot Off the Press: Regional Nerve Blocks for Hip and Femoral Neck Fractures: A Systematic Review. Luckett-Gatopoulos S, Thoma B, Milne K, **Bond C**. CJEM. 2016 Jul;18(4):296-300. doi: 10.1017/cem.2016.332. No abstract available. PMID: 27435938

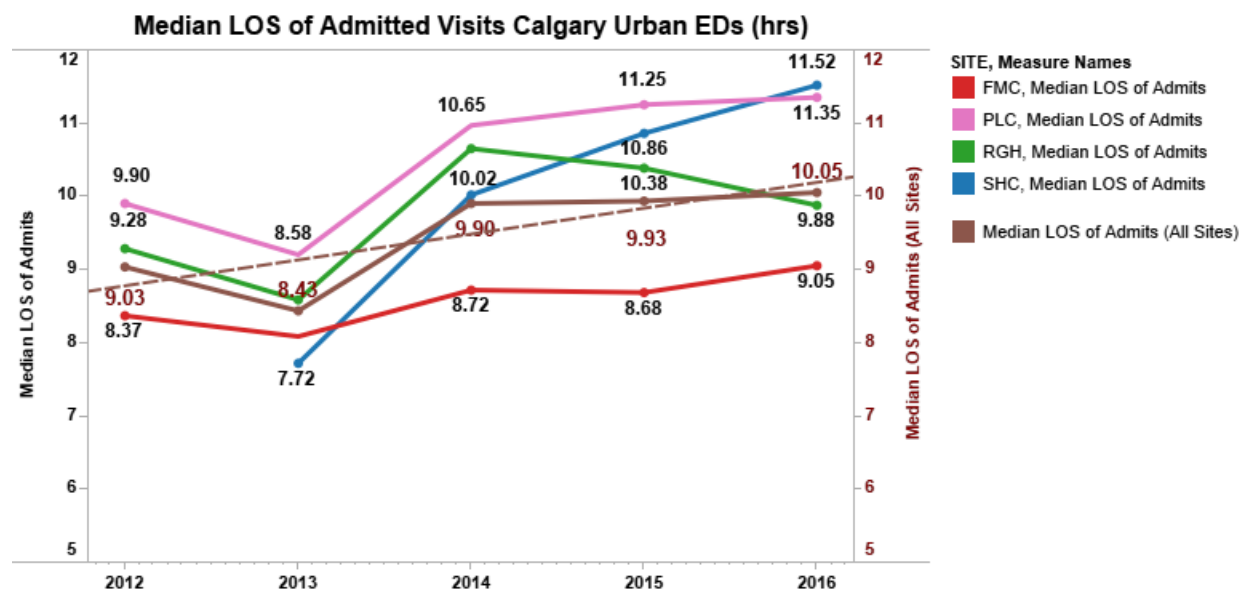
Annual Operational Data

Comparative Annual Data

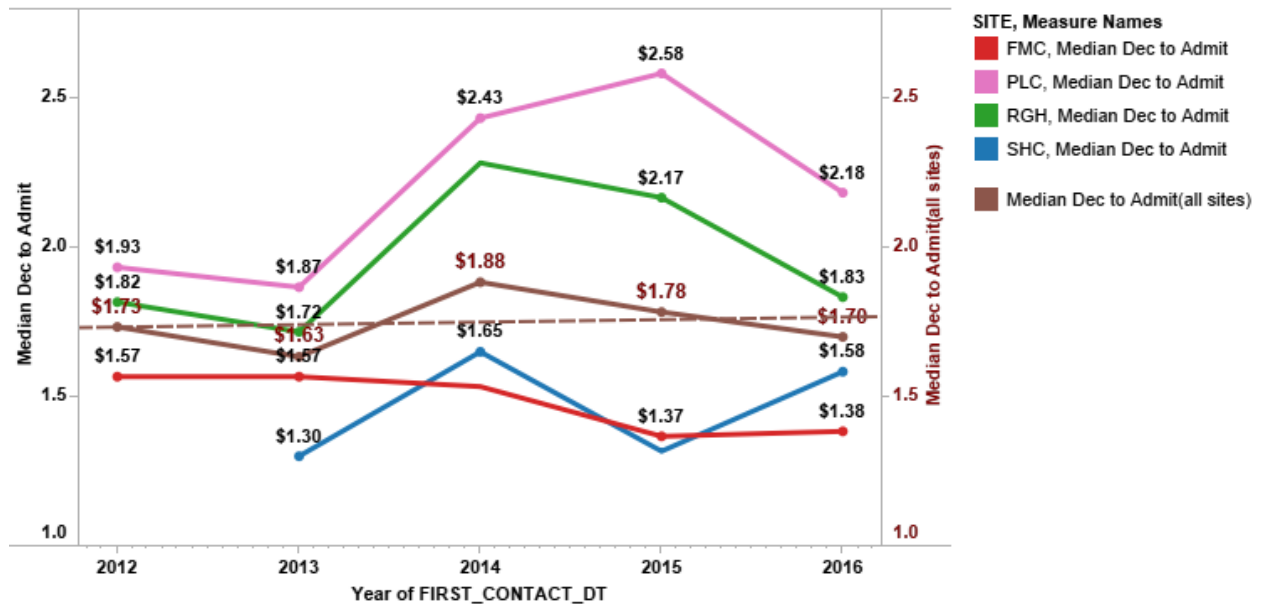


Dongmei Wang
Data Analyst

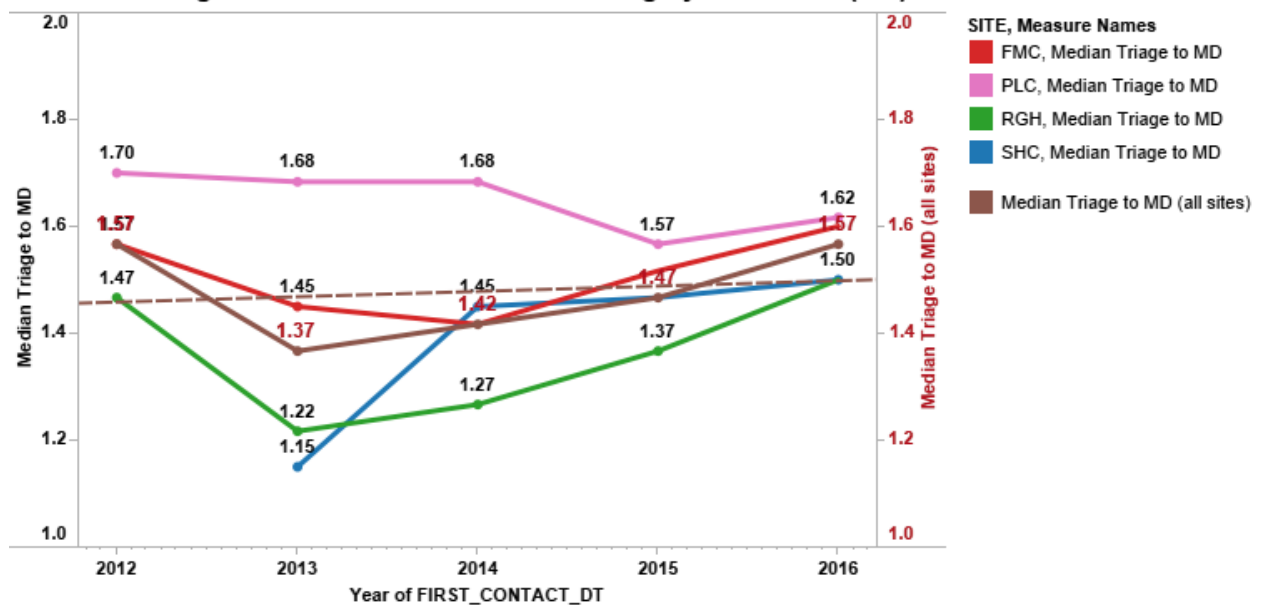
ANNUAL LOS DATA



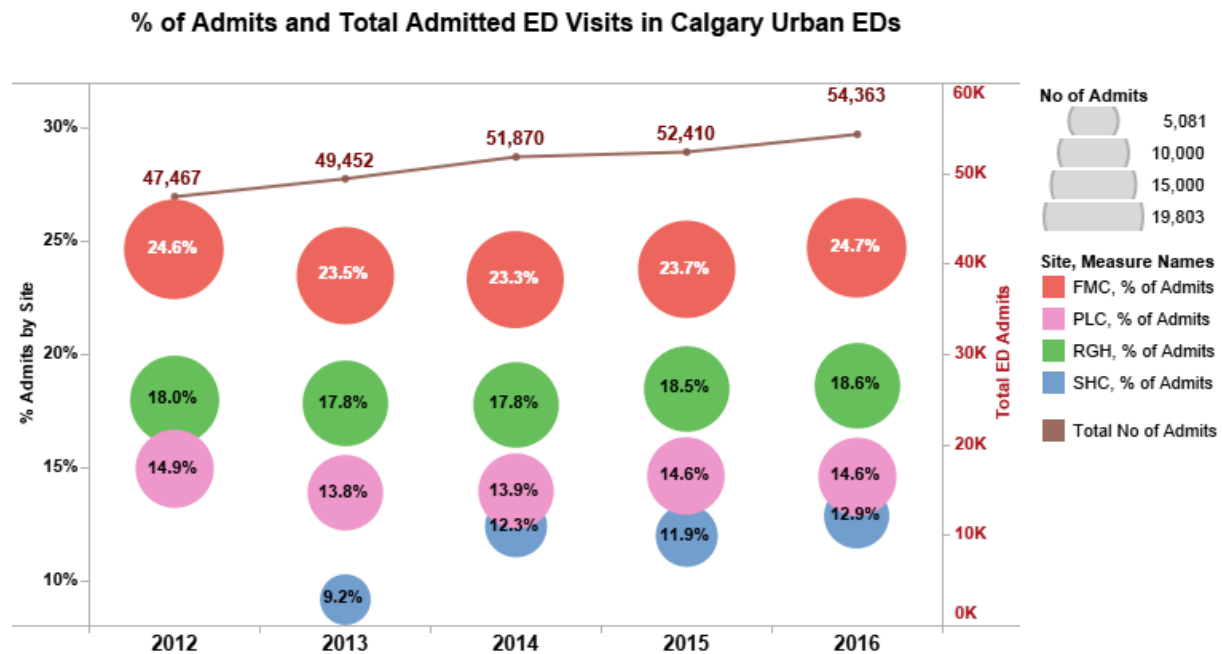
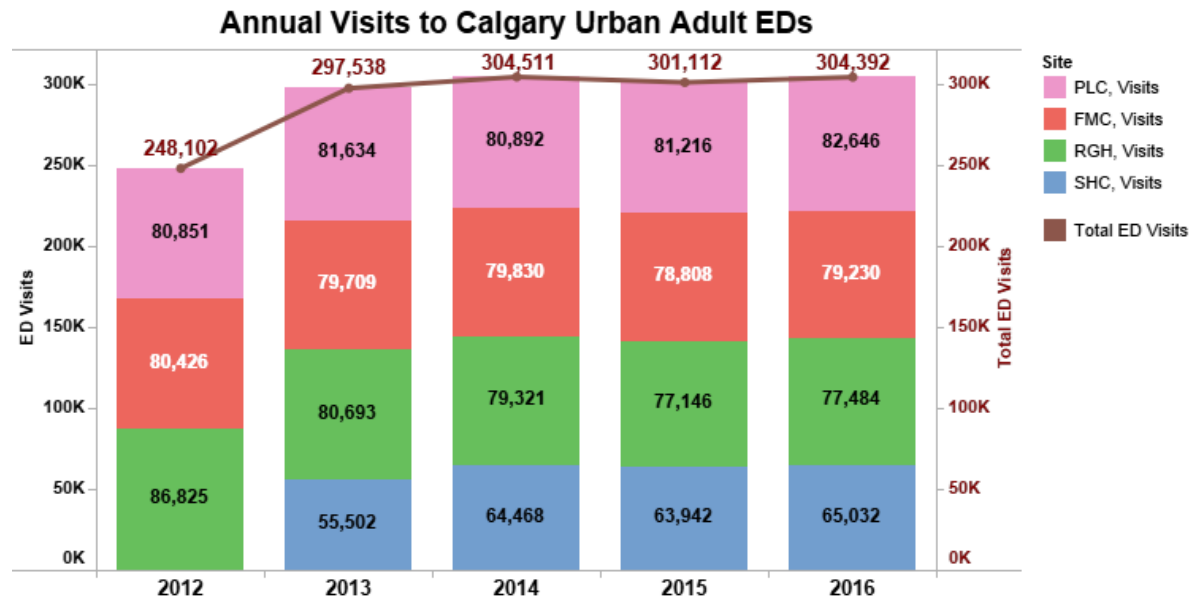
Median Decision to Admit Time Calgary Urban EDs (hrs)



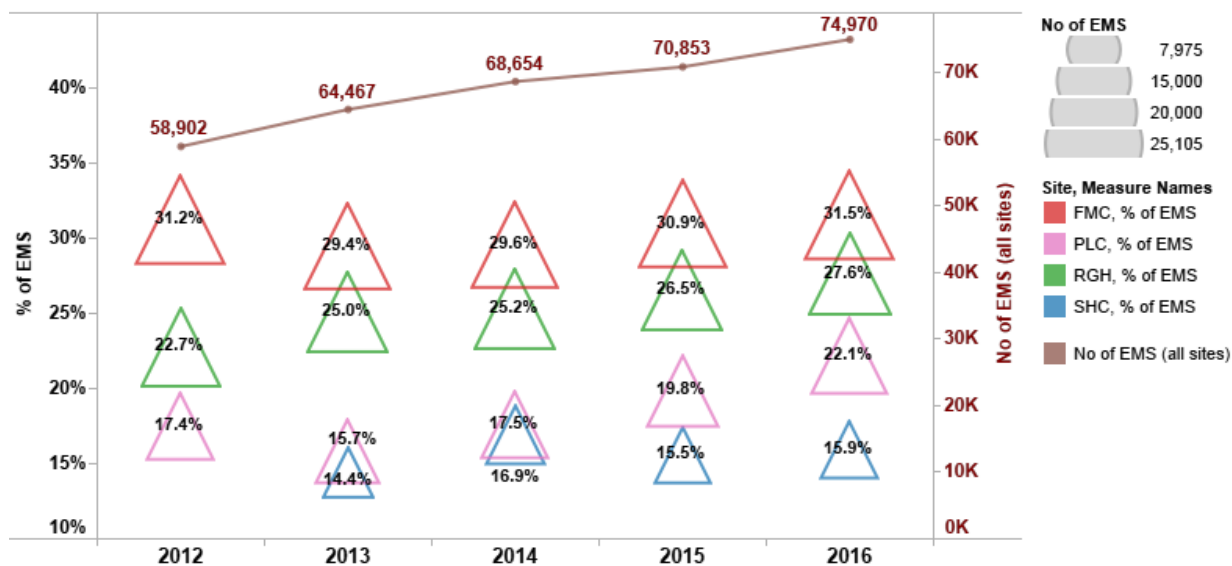
Median Triage to MD of CTAS2&3 ED Visits Calgary Urban EDs (hrs)



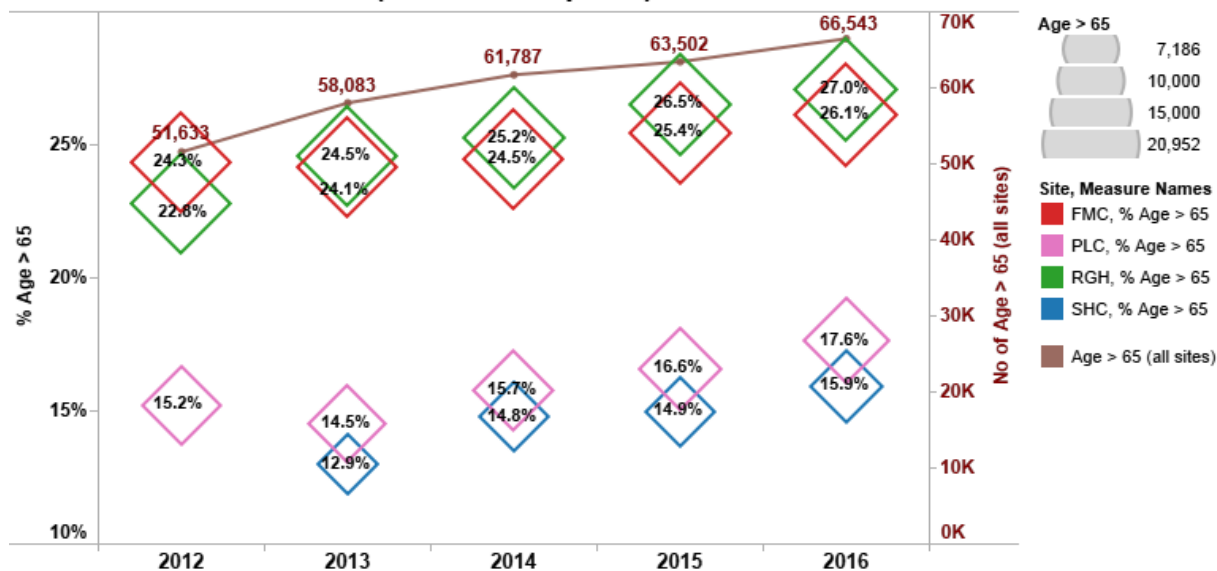
ANNUAL VISITS TO EDs DATA



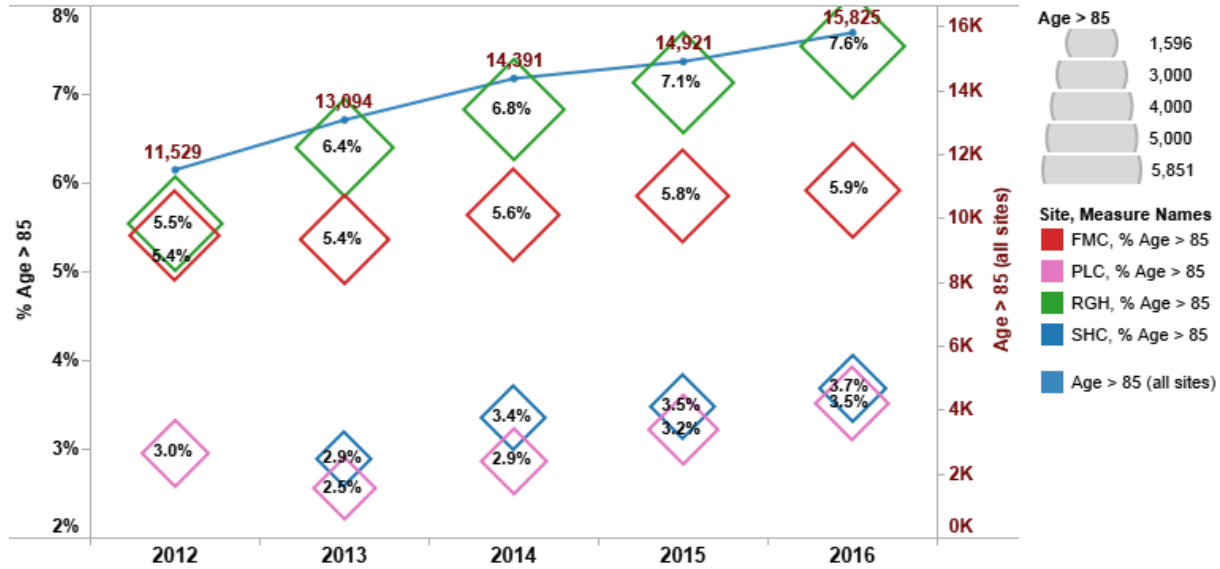
No and % of ED Visits Arrived by EMS Calgary Urban EDs



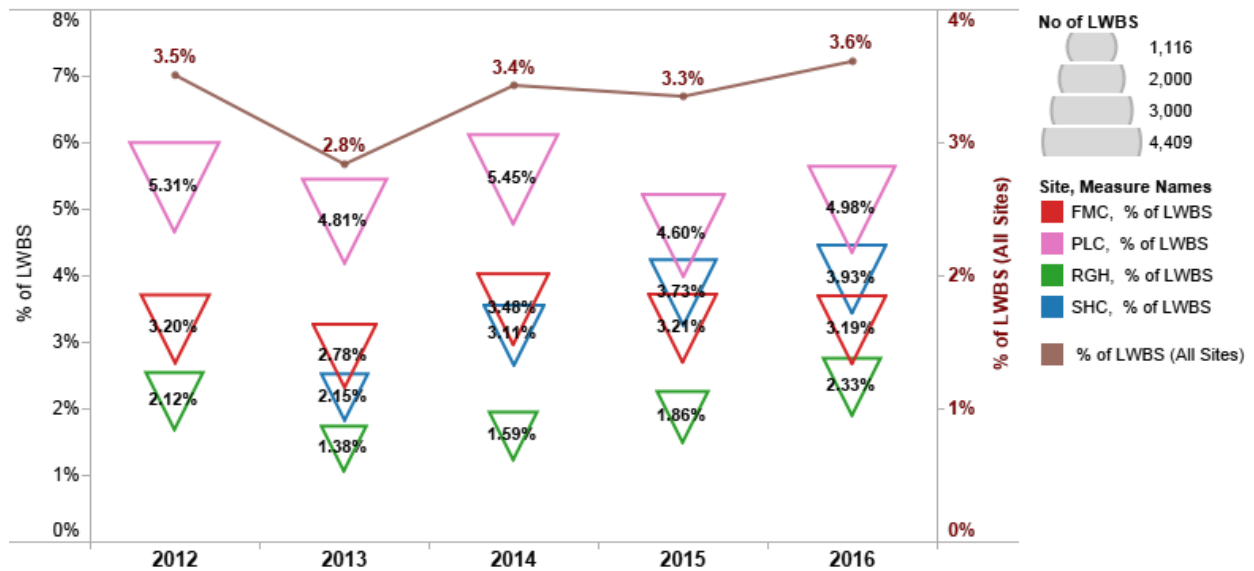
No and % of ED Visits aged over 65 Calgary Urban EDs (2016 YTD Sept. 30)



No and % of ED Visits aged over 85 Calgary Urban EDs



No and % of ED Visits LWBS at Calgary Urban EDs



Site Updates and Accomplishments

ROCKYVIEW GENERAL HOSPITAL



Dr. Nancy Zuzic, MD
RGH Site Chief

The RGH ED saw a slight increase in annual visits for a total of 77,483 in 2016 (76,988 in 2015). There were similar numbers of Emergency Inpatients (EIP's) in 2016 compared to the previous year, however the volumes had a different distribution. Although there was a decrease in the number of EIP's holding March through October, this was offset by record high number of EIPs holding in early (January/February) and late (November/December) 2016 which had a notable impact on department operations.

Higher acuity patients and larger volumes of patients continue to be sent to the Intake area. We see 40 to 60% of our daily ED visits in Intake. In 2016 and currently the Intake area often acts as the safety net of the ED as the only place to see acute patients when there are no stretcher spaces. This expedites the care of patients with potentially life-threatening conditions but also leads to decreased flow in the area and the entire department. The ED Flow Improvement team continues to monitor Intake flow and attempts to identify and implement improvements where possible.

The Rockyview Emergency Department continues to innovate to improve the experience of the Emergency Department for patients and their families. The following projects and processes have been a focus this year:

EMS Hallway Alert

The EMS Hallway Alert Process stems from a continued drive to reduce the number of patients and length of time patients are waiting with EMS. The process contains an inclusive page to all ED physicians, as well as outstanding consultants when an EMS patient has been waiting greater than 90 minutes. This communication supports frequent evaluation of patient dispositions and opportunities for improved patient flow.

Ottawa Chest Pain Rule

Another effort to improve patient flow in the department involves the evaluation of patient care needs based upon the Ottawa Chest Pain Rule. Patients that are in the process of being evaluated for chest pain are considered for treatment in non-monitored care spaces based on guidelines inspired by the Ottawa Chest Pain Rule. This provides additional options for patient flow in the department while maintaining patient safety and high quality care.

Esophageal Foreign Body Process

The Esophageal Foreign Body Process is aimed at expediting GI endoscopy procedures for patients presenting with food bolus esophageal foreign bodies. The goal of this initiative is to decrease wait times for patients, support patient flow, and reduce costs related to activating the GI lab after hours.

PCN Referral Processes

The RGH ED continues to partner with the Calgary West Central PCN to provide referrals for three different patient populations. The Triage referral stream was modified in June to include a single nursing assessment (changed from a two RN requirement); this referral process has gained momentum, as

exemplified by the doubling of referral numbers compared to 2015. Post discharge follow up referrals for unattached patient have consistently improved and remain a valuable discharge resource for physicians and patients. The ultrasound follow up referral pilot ended in early 2016 and has become an efficient operational process in the ED. These processes support both ED operations, with reduced patient visits, and also patient focused care by reducing time spent waiting in ED.

Improving ED to IP Transfers

RGH ED has been collaborating with the site, through the Site Capacity Committee to improve transfers from ED to inpatient beds. This work includes improved communication via the Nursing Transfer Report and concurrent bed cleaning, booking and report between ED and inpatient units to decrease empty bed and transfer time.

Psychiatry Assessment Team and ED Collaboration

While the volume of admitted mental health patients remained steady, the length of stay for these patients increased this year to an average of 19 hours and a 90th percentile length of stay of over 40 hours (increasing from 17.6 hours and 34 hours respectively). In response to this the Psychiatry Assessment Team and ED participated in a collaborative day to address challenges and brainstorm solutions. This led to the implementation of a q shift huddle and more structured communication and report between Assessment Team staff and the ED Nurse and Clinician.

INFO Sessions

RGH ED was the pilot site for INFO sessions (Immediate, Non-threatening, Facilitated, Opportunity), which began in March 2016. These sessions are RN facilitated scripted debriefing sessions that are completed following a resuscitation, critical event, or when requested by Emergency Department staff. Since implemented, approximately 60 debriefing sessions have taken place. Post implementation feedback received by ED staff has indicated that staff are better able to understand the perspectives of their colleagues, and that the vast majority of staff agree that INFO sessions will improve teamwork within the ED. INFO sessions have since been implemented at 2 other Emergency Departments within the Calgary Zone. With the success of this project at the RGH ED, Dr. Stuart Rose and Laurie Leckie (Clinical Nurse Educator) will be presenting at the International Meeting on Simulation in Healthcare (IMSH 2017) in Orlando, Florida.

RGH ED Falls Prevention Strategy Adopted Site Wide

After the successful implementation of the RGH ED Fall Prevention Strategy in 2015, the purple band was adopted across RGH as the site-wide fall risk indicator. This strategy supports clear identification of a patient at risk for falls regardless of where they are in the facility. The purple band will also be implemented at other Calgary Zone sites in the upcoming year.

Staffing

Building on the demand capacity matching that was implemented several years ago, the RGH ED has increased its flexibility and responsiveness to patient load by actively increasing and decreasing staffing during days/periods of lighter or heavier demands. This has resulted in better matching of staffing to patient volumes and decreased costs.

Physician Manpower remains stable with 56 physicians scheduled at the site. In order to meet patient demand/ arrivals an evening shift was added Mondays to Fridays and an additional day shift was added on Mondays. The Intake area continues to have a dedicated physician from 9am to 11pm and there is a dedicated minor treatment physician from 10 am to midnight daily (2 7- hour shifts). Shift times and need for additional shifts continues to be examined on a regular basis. The Zone Surge Protocol continues to be initiated when an additional physician is needed due to patient volume.

The RGH ED continues to work with the RGH site as a whole and with the other ED sites at a zone level to provide the best patient care possible and to address the current capacity issues throughout the zone. We are fortunate to have a team of engaged physicians, RN's and support staff who bring excellent care to our patients in an often overcrowded and stressful environment and who contribute extra-clinically to committees that strive to improve the patient experience.

FOOTHILLS MEDICAL CENTRE

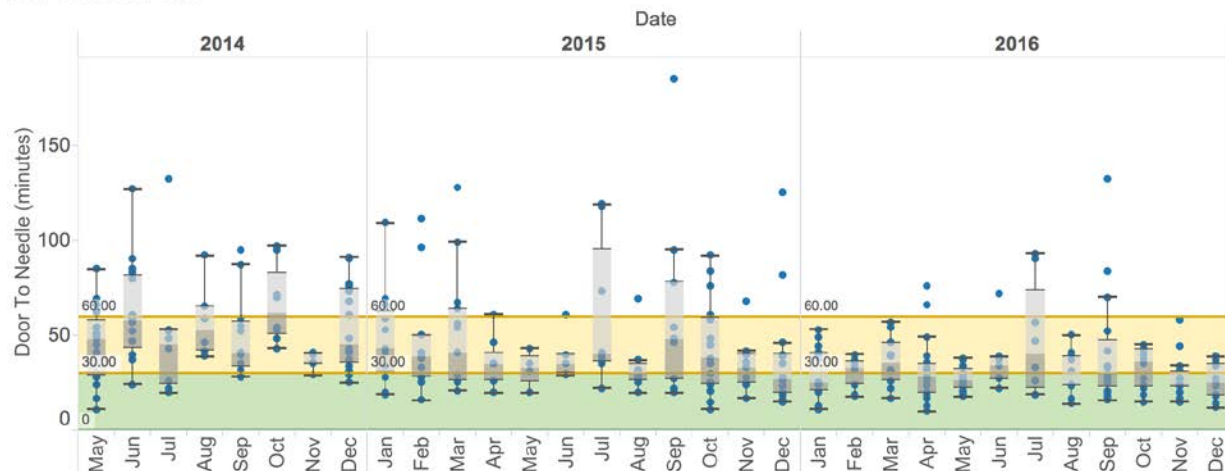
Engaging with community partners to support patients: the goal is to work with EMS, PCN's and other services to develop processes to support specific population, including seniors, and patients who use the EDs frequently in order to provide coordinated care across the zone.

- The Calgary ED Zone work continues with the Calgary Case Management Group to focus on providing continuity of care to Familiar Faces that present to the emergency department. This team has representation from EMS, Social Work, The Drop-In Centre, The DOAP Team, AHS. Currently the focus is to align patients with a family physician. The CUPS organization plays a key role with this initiative.
- CUPS referral project- referral project with CUPS nurses to ensure that marginalized individuals that have a health crisis are followed in the community by appropriate resources. CUPS referrals has spread to including follow up with the admitted patients
- Primary Care Network referral project: this is an established process with a daily referral average of 3 per day. The process has been refined in that the referral and appointment can be completed by the initial RN when assessed at triage. Ongoing data collection and monthly meetings continue to occur to evaluate the program.

Enhancing processes to support safe, effective care for patients.

- Quality improvement work continues focusing on creating efficiencies in the care of level one trauma patients. Work continues on communication within the team in preparation and while providing care of the level one trauma patient. Review is in progress of the Trauma Bay layout, supply carts, equipment and medication room.
- EMS 90x90 (EMS patients assigned ED bed within 90 minutes of arrival, 90 percent of the time) has changed to 60x90- Regular multi stakeholder meetings occur to improve flow and transfer of care times for EMS patients. In May five beds were opened in the 80's area to download EMS patients awaiting a treatment space.
- Extensive work has been completed in collaboration with Supply Management to optimize the scanning, stocking, placement and utilization of supplies throughout the department. This work has been initiated to address both patient safety and cost savings.
- Master project is nearing completion on "Developing a Health Work Environment in the ED". Frontline and leadership working groups have met, awaiting the results of those focus groups to determine next steps.
- The Stemi collaborative has regrouped to streamline the process in order to improve patient care and access. This work involves EMS, Stemi team, and ED.
- STEMI research project has started re: Obtaining a timely ECG upon the arrival of the ambulatory STEMI patient Continued work with HASTE III- improving door to needle time for STAT! Stroke patients
- Work continues with HASTE III- improving door to needle time for STAT Stroke patients :

Door-to-Needle Time



Door To Needle for each month. The box-plot shows: the median by the line in the middle of the box, the 25th percentile is the bottom of the box, the 75th percentile is the top of the box. The bottom error bar is the 5th percentile and top error bar is the 95th percentile.

AHS targets:

Time to see an Emergency Physician:

- Ongoing challenges meeting established triage to MD benchmarks, largely due to high occupancy rates of ED treatment spaces by EIPs. There was a significant year over year (2015 vs 2016) increase in the number of EIPs holding at 0600. This was particularly problematic in Q4 of 2016.
- % of CTAS 2 patients seen by an MD within 30 minutes is 24%
- % of CTAS 3 patients seen by an MD within 60 minutes is 24.5%
- Additional 6 hrs of ED MD coverage was added during peak periods (12-18 M-F)
- TP 3 was opened in June of 2016, replacing the existing 20's and EIP area. This includes 10 treatment spaces, 4 of which are isolation rooms equipped with ante rooms. ED management, Site Chief and support staff have moved to a new Admin space. The new space has proven to be highly functional and has enhanced the number of isolation rooms for the ED.
- The next stage of the renovation (TP4) is scheduled for completion in December of 2017 which will result in an additional 30 treatment spaces. There are, however, no additional operating funds allocated to these additional spaces at this time. As such, the utilization of these rooms has yet to be determined.
- Work is ongoing in the ITC meetings in regards to improvement of Intake and MET, and how we can utilize that space in a more productive manner

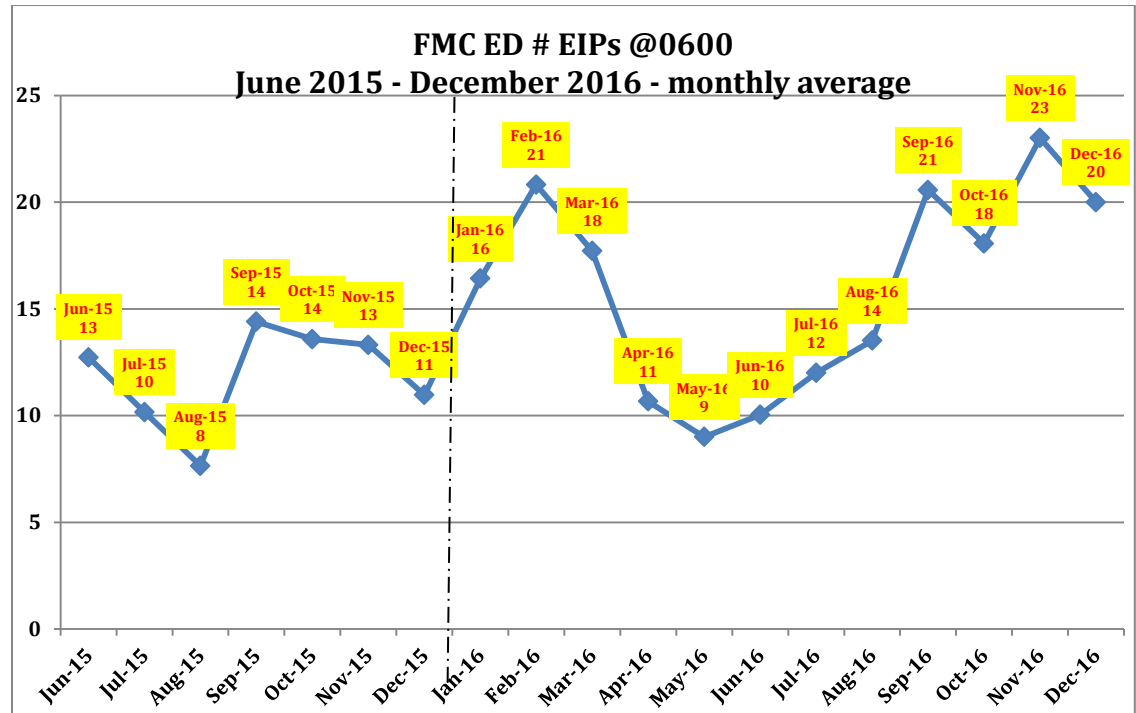
Dashboard:

1. Patient acuity 2016 (% of total volume)

- CTAS 1 = 2716 (3.4%)
- CTAS 2 = 29192 (36.8%)
- CTAS 3 = 31537 (39.8%)
- CTAS 4 = 12506 (15.8%)
- CTAS 5 = 3278 (4.1%)
- Total patient volume = 79229 (2015 = 78808)

- % of Admission= 24.7% (2015= 23.7)
- % of patients arriving by EMS = 31.5 (2015= 30.9)

2. Number of emergency-in-patients (EIPs)



3. ED targets

- 90 x90 has changed to 60x90. EMS downloads within 60 mins (target = 90%) , actual = 71%
- Length of stay (LOS) for the admitted patient in ED (target is 8hrs, 90% of time) actual = 45% of admitted patients leave department within 8hrs
- Median LOS for admitted patients in ED (target 8hrs) = 9.05hrs (2015 = 8.68 hrs)
- LOS for discharged patient from ED (target is 4hrs, 90% of time) = 52% of discharged patients leave department within 4hrs

Peter Lougheed Centre



Dr. Neil Collins, MD
PLC Site Chief

Accomplishments

1) Accommodation of a significant increase in patients arriving by ambulance

Continuing the trend from previous years, the PLC ED saw a further increase in the number of patients arriving by ambulance. (2166 **more** patients arrived in 2016 than 2015) Despite the increase in ambulance arrivals, we were able to maintain our compliance with the 90 X 90 initiative at between 80 and 90%.

Enhanced communication with paramedics, prioritizing EMS patients, and improved ED bed turnover have allowed the ED to increase its share of Calgary's EMS transported patients. I believe

that this has allowed some load-leveilling of the higher acuity patients in the city.

2) Engaging with community partners to support patients.

- a) PLC ED is working with EMS, PCN's and other services to develop processes to support specific populations, including seniors, and patients who use the EDs frequently in order to provide coordinated care across the zone.
- b) Decanting of patients requiring non urgent ultrasounds to an outpatient RCA clinic has off loaded the inpatient ultrasonographers so that they can provide better service to urgent ED scans and inpatient scans. Currently these patients return to the ED for reassessment; we anticipate a partnership with a family medicine clinic that will see those patients who do not require hospital care, instead of them returning to the ED.
- c) **Partners for Better Health (PBH)** is a collaboration of the Peter Lougheed Emergency department, East Calgary Care Centre and Mosaic PCN. ED Patients residing in NE Calgary who are identified as medically complex and perceived as high system users are referred to Partners for Better Health. PBH is working to address the needs of this population by delivering comprehensive primary care through an intensive case management model using the IHI methodology. PBH has enrolled 220 patients and currently have 149 active patients.
- d) The Peter Lougheed Emergency Department is currently working with East Family Care Centre and other patient providers to develop two **Emergency Patient Care Plans** (for select frequent ED visitors) that will exist in the computerized health record and assist in coordinating care between Emergency sites and the community.

3) Paediatric Knowledge Transfer

7% of the patients at PLC are children and the ED department leads the pediatric code blue team for the hospital. Through high fidelity multidisciplinary simulation sessions and pediatric expert led educational initiatives we have more closely aligned our practice to adhere to ACH protocols.

4) Other initiatives

- Enhancing the scope of Orthopedic Technologists to include LPN skills
- Fall prevention initiatives
- Budget savings through inventory reduction
- Reorganization of the Minor Treatment area to accommodate inpatients awaiting admission
- Refining role ED pharmacist to include follow-up of abnormal lab results
- Pediatric pain management project

Challenges

- 1) Emergency Inpatients (EIP's). Optimizing our use of existing assessment spaces to provide care for 220 to 280 patients a day while EIP's occupy 50 to 114% of our traditional bed spaces continues to consume the administrative resources of the PLC ED. The PLC ED continues to be the busiest ED in the city with 82,646 visits in 2016. We now see approximately 50% of our patients in a temporary, non-traditional hallway area with inadequate infrastructure (no wall suction or medical gases) and minimal visual or acoustic privacy. High wait times for assessment spaces during peak hours has shifted the ED work load further into the night time hours, adding inefficiency as resources are often unavailable between 2300 and 0700. We have responded by increasing our ED MD and RN coverage to match patient volumes, and by increasing ED bed turnover (patients are often assessed in stretchers and then immediately moved to the waiting room). We have also expanded our footprint to hallways outside of the ED. High wait times and inadequate assessment and treatment spaces has severely degraded the patient experience and contributed to record levels of patients leaving without being seen. It has also added substantially to patient complaints and the subsequent increased exposure to medicolegal risk.
- 2) Other infrastructure challenges. A recent safety rounds identified areas of ongoing infrastructure deficiency at the PLC ED.
 - 1) the lack of a secure med room
 - 2) the inability to lockdown the intake area and the entire back hall of the emergency department exposing patients and staff to unacceptable security risks
 - 3) the lack of wall suction, medical gases, and monitoring capacity in the intake area (where 50% of our patients are seen)
 - 4) the general appearance of the unit is weathered with many walls requiring repair and repainting, chairs that need to be replaced, surface counters that are peeled, chipped or broken, TV screens not displaying information, supplies cluttering many hallways
 - 5) way finding for patients is challenging – way finding tape is peeling or missing, poor signage has patients and families wandering all through the unit, the door between intake and D area has very high traffic volume
 - 6) lack of isolation rooms and hand washing stations
 - 7) inadequate acoustic and visual privacy in the “temporary” hallway assessment spaces where we now see over half of our patients
 - 8) inadequate mental health patient secure holding rooms resulting in patients with behavior challenges or psychosis being cared for in unsecured, overcrowded areas leading to injuries to staff
 - 9) distance from the ambulance bay to the ED is unacceptably long (critically prolonging the length of time that pulseless patients are exposed to inadequate chest compressions)

* The persistence year after year of the above infrastructure deficiencies when there exists in the Peter Lougheed Hospital an empty renovated space earmarked 10 years ago for a new emergency department is a source of frustration and diminished morale amongst ED staff.

SOUTH HEALTH CAMPUS

The South Health Campus Emergency Department serves the growing communities in the south of Calgary. Since opening in 2013 the ED continues to support the SHC hospital pillars of care including the provision of: patient and family-centered care, wellness education, innovative care and collaborative practice. Over 60 000 adult and pediatric patients are cared for in the emergency department with a steady increase in the acuity and complexity of presenting complaints each year.

Significant Accomplishments 2016

1. **Opening of the Intake Care Space.** In response to the growing pressure of ED overcrowding, 5 additional assessment spaces were opened in 2016. The opening of this area was the result of collaboration between physicians, nurses and allied health care workers. This is now one of the busiest areas in the department delivering care to a significant number of patients and resulting in decreased wait times for patients.
2. **Adult and Pediatric Emergency Care and collaboration.** The SHC ED continues to benefit from the presence of dedicated pediatric emergency physicians. This team of doctors and nurses delivers excellent care to the growing pediatric population in South Calgary and has successfully initiated a number of projects including the increased early use of analgesics and topical anesthetics to improve patient comfort.
3. **Planning and development of a dedicated pediatric care space.** In response to the high numbers of pediatric patients and the desire to separate the care of adults and children in the ED, a funding campaign was initiated to develop a new treatment area. Development of this area will increase the capacity to care for adult and pediatric patients.
4. **ED Pharmacists.** Pharmacists are an integral part of the SHC ED team, following up on abnormal lab results, providing patient education and regularly consulting with physicians around safe prescribing practices.

Overcrowding continues to be the major issue facing the SHC emergency department. Going forward, the ED will continue to review wait time data and work with hospital and community partners to deliver excellent and timely care.

Clinical Informatics



Dr. Tom Rich, MD
Physician Lead
Clinical Informatics

Significant Accomplishment for 2016:

1. Significant work around order sets and content (Shawn Dowling)
 - a. Alignment with CKCM topics
 - b. Evidence based information and clinical decision support
 - c. Choosing Wisely initiatives with reduction in unnecessary investigations and cost savings
2. Full implementation of abnormal microbiology Advanced Visit List to improve timely access, follow-up and documentation of positive culture results ordering in the ED.
 - a. Improved efficiency, patient safety, and standardized documentation
3. Successful Implementation of ED specific treatment plans for patients with unique and complex needs
 - a. Estimated savings of \$250,000 in reduced unnecessary interventions and reduction in hospital admission
4. Successful collaboration with University of Calgary on innovative custom design Clinical Decision support (currently part of a research project for effectiveness of the CDS tool)
5. Enhanced Physician clinical performance metrics for evaluation
6. Successful implementation of an ED Sepsis alert reducing time to antibiotics in patients with severe sepsis. Currently being analyzed to see impact on outer outcome measures such as hospital LOS and mortality

Priorities for 2017

1. Replacement of the current Sunray card reader system as no longer supported or manufactured
2. Fully electronic follow-up of DI reports following the success of the abnormal microbiology AVL
3. Further reduction in unnecessary testing based on Choosing Wisely Campaign
4. 16.3 system upgrade and analysing enhancements available for the SEC tracking board
5. Implementation of Orders Reconciliation Module in ED
6. Complete revamping of the EDUCC Visit summary into an interactive document to coordinate and stream line the ED Discharge process
7. Increased electronic clinical documentation in the ED
 - a. Discharge document
 - b. Sick letter
 - c. Referral letter

- d. Nursing assessment
 - e. MD procedures
 - f. Importing monitor information (ie vitals) to SCM
- 8. Ongoing order set content reviews and alignment with CKCM
- 9. Continued expansion of ED treatment plans to include patients with complex medical/psychological/social needs with frequent ED visits
- 10. Strategies to minimize entering orders on the wrong patients
- 11. Improved out-patient referral process (from paper to electronic supported model)

Medical Education



CCFP-EM Program

The University of Calgary CCFP-EM residency program celebrated another successful year. The program continues to be one of the top CCFP-EM programs in the country and is highly sought after by Family Medicine residents seeking additional training in Emergency Medicine. This year we received 116 applications and interviewed 26 candidates and were successful in filling our 8 residency training positions in the first round of CARMS.

This year our program received 2 awards from the Post Graduate Medical Education office highlighting our commitment to excellence in residency education. Dr. Stuart Rose, the CCFP-EM SIM lead, was presented with the award for outstanding commitment to residency education. Dr. Aaron Johnston, the CCFP-EM residency program director was presented with the award for resident mentorship.

Our strong academic tradition continues with EKG rounds, ultrasound training, medical education training and exam preparation embedded into the academic full day. Human Patient Simulation (HPS) has been expanded to twice monthly and exposes our residents to disease processes they may not encounter during their training as well as building their crisis resource management and procedural skills. This year we have also added elements of performance coaching to our curriculum, a cutting edge innovation in medical education that we hope will help our residents achieve their best.

The CCFP-EM residency program continues to act as a resource to the communities of Southern Alberta. Over the past year we have strengthened the relationship with our rural and regional training sites. We are proud to support a growing Human Patient Simulation program at Mineral Springs Hospital in Banff which provides our residents with an opportunity to apply their critical care skills in a smaller hospital. We have also added representation to our CARMS committee from our regional and rural site directors and reviewed our CARMS process to ensure that they are aligned with the best practices and

accountabilities of the Cumming School of Medicine. We have added additional rural and regional training opportunities for our residents. Finally we have offered formal assistance in exam preparation to CCFP physicians practicing in rural and regional Emergency Departments who are seeking to improve their Emergency Medicine skills through attaining the CCFP-EM certification through the practice eligible pathway.

The past year has been a time of significant economic uncertainty in the province of Alberta and this is also true for the CSM residency programs. We have been fortunate to continue to have financial support from the Distributed Rural Learning Initiative to place our residents on rotations in rural and regional sites. We are also very fortunate to have a large group of dedicated teachers and educators in our department who go above and beyond to train our residents as well as providing substantial financial support to the residency program through the Physician Support Fund.

FRCPC - Emergency Medicine Residency Program

The FRCPC program enjoyed another successful year under the leadership of Dr Sarah McPherson and Dr Marc Francis. Stacey Dickinson, Judy MacKay and Tris Malasani provide much appreciated administrative support to the team. There are currently 22 residents enrolled in the program. In the 2016 CaRMS match, we recruited four candidates, Ryan Allen, Katie Anker, Kelsey Ragan and Ryan Wilkie, they are an excellent addition to the program. We are happy to report the 5 senior FRCPC residents were successful at their National Exams and are all practicing in Calgary.

The Royal College is implementing its new initiative “Competency by Design”, which aims to improve resident training, lifelong learning and enhance patient care. Emergency Medicine makes the transition in July 2018. Throughout the year Dr. McPherson attended meetings with the Specialty Committee of the Royal College. The committee is designing the necessary assessment tools and providing recommendations for training experiences to facilitate the transition to CBD. In November a Competency Committee was formed for the FRCPC program in alignment with recommendations from the Specialty Committee.

During the Annual joint U of C/U of A Resident Retreat and the annual Longitudinal Preceptors dinner we are able to complete a comprehensive review of the programs. The RTC (Residency Training Committee) meets monthly to implement changes, discuss ideas and ensures the program is meeting the goals and objectives set forth by the residents. Changes to the resident daily evaluations and preceptor feedback were made to help provide more useful and effective feedback. Faculty development and more formalized direct observation in the form of McMAPS were initiated with success.

We were successful in procuring PGME grants to fund a simulation mannequin to support US training as well as grant money to support curriculum development for jr simulation and simulation courses for training core teaching faculty.

Every year we are honoured to host an Annual Year End/Awards BBQ. It gives us an opportunity to celebrate the residents who have graduated as well as welcome the newly matched residents who will start on July 1. It also allows us to give awards and recognize the excellent teachers within our own department but other departments who contribute to teaching of Emergency Medicine Residents throughout the year.

Off-Service and elective medical Education (2015-2016)

Rotations in the Calgary Zone adult emergency departments continue to be highly sought after by University of Calgary residents and their home training programs. The Department of Emergency Medicine hosted 101 mandatory off-service learners during the 2015-2016 academic year. This represents approximately 11,500 hours of direct 1:1 learner supervision by our teaching faculty. The majority of these resident physicians were from the family medicine residency training program (75 learners), while the remainder came from internal medicine (4 learners), orthopedic surgery (4 learners), general surgery (5 learners), neurology (3 learners), pediatric emergency medicine (2 learners), dermatology (2 learners), dental medicine (2 learners) and cardiac and vascular surgery (1 learner each). Our Department continues to handle this demand while maintaining a 1:1 preceptor to learner ratio for most shifts.

Since emergency medicine remains popular among Canadian medical students and family practice residents, the demand for medical student and resident electives in our Department continues to grow. In the 2015-2016 academic year, the Department of Emergency Medicine received elective requests from 112 residents (mostly family medicine) and 74% of these residents were offered electives. We hosted 69 elective residents (up from 52 in 2014-2015) with requests from the University of Calgary (50 residents), UBC (15 residents), U of A (8 residents), U of T (10 residents), U of O (4 residents), and other Canadian schools, as well as two nursing practitioner students. Notably, we have hosted 8 residents from other FR training programs in Canada this year, showcasing the popularity of Calgary as a teaching site and possible future employment prospect.

On the medical students side, in the 2015-2016 academic year the Department of Emergency Medicine received elective requests from 286 medical students and 65% of these students were offered electives. We hosted 152 elective students (up from 97 in 2014-2015) with requests from the University of Calgary (48 clerks), UBC (48 clerks), U of A (30 clerks), U of T (29 clerks), UWO (18 clerks), U of O (26 clerks), McMaster (22 clerks), Queens (15 clerks), U of M (10 clerks), U of S (10 clerks), Dalhousie (9 clerks), as well as a few requests from each of the other Canadian schools. The 221 elective learners we hosted in 2014-2015 represent over 15,500 hours of direct 1:1 learner supervision by our teaching faculty. This increase in demand for electives remains consistent and at this point in the 2016-2017 academic year, the department has received 90 elective requests from residents and 169 elective requests from medical students. We were also able to host 33 pre-clerkship elective students from the U of C for their “med 440” block. Calgary emergency department has always been able to accommodate all interested 440 students due to the strong support our staff gives to these junior learners. The rotation continues to have strongly positive reviews from the students.

Overall, both the mandatory and elective adult emergency medicine rotations are highly regarded by our learners, who appreciate the diversity of patients, high quality bedside teaching, and one-on-one direct staff supervision around the clock. In total, our teaching faculty provided well over 30,000 hours of direct 1:1 learner supervision in the 2015-2016 academic year, and this figure does not include the hundreds of hours our faculty spent on the direct supervision of pre-clerkship level students through the University of Calgary summer pre-clerkship elective program as well as the many U of C medical students who request informal shadowing of an emergency physician throughout the year. The addition of electronic evaluations has streamlined the process of direct feedback and has been well received by learners throughout the program.

University of Calgary Emergency Medicine Clerkship

The Emergency Medicine Clerkship course was once again a rousing success. Students have shown overwhelming support for the program, and consistently rate the clerkship among the top of all clerkships offered in medical school. On a yearly rating scale, the EM clerkship is in the top 2 of mandatory rotations. Overall rating score was 4.2 on 5 point scale. The number of students participating in the EM clerkship continues to grow. The graduating class of 2016 had 155 students. We are anticipating class a graduation class of 167 students in 2017.

Highlights include the breadth of patient care as well as the direct interaction between faculty and students. Students are involved in the investigation and treatment of acutely unwell, often critically ill patients. On shift the students are able to demonstrate procedural skills essential to becoming competent physicians (i.e. suturing, casting, fracture reduction, EKG interpretation, etc.).

The end of 2016 brought about a change in the leadership of the Undergraduate Emergency Medicine program. Dr. Trevor Langhan has stepped away from his role as the clerkship director, with Dr. Gavin Greenfield taking over the program. We look forward to the innovation and leadership Dr. Greenfield has to offer.

Haskayne - Calgary EM collaboration

Together with professors and graduate students in the Operation & Supply Chain Management area of the Haskayne School of Business we are collaborating on a number of research projects. The overarching goals in these projects are to retrieve managerial insights from the data that is collected by Alberta Health Services and to propose new guidelines to support non-medical decision making. Example projects that we are currently working on include the estimation of waiting times in the emergency department and how this information can be used within AHS and for the general public, and the scheduling of physicians where we incorporate the patient-per-hour rate of physicians and we match the ED capacity with the demand for emergency care.

Emergency Ultrasound



Dr. Mark Bromley
ED Ultrasound Coordinator

Calgary Emergency Department Ultrasound has been quite active over the past year with several initiatives seen through to completion. There were several successful EDE I and II courses over the past year for both staff and residents. Our junior ultrasound block and senior ultrasound curriculum have been successfully implemented and have been very well received.

The batteries on the ultrasound machines have been upgraded and we're working on replacing faulty probes and potentially adding even more ultrasound machines.

We are arranging interdisciplinary ultrasound rounds with Emergency, ICU, Trauma and Internal Medicine to occur every other month for the academic year. During these rounds we review interesting/complex cases that have been saved to Qpath which highlight the role that point of care ultrasound played in the care of our patients.

Paul McKenna and Jibran Sharif are our current ultrasound "fellows", with expected completion this summer.

We will also be working toward getting all of staff physicians EDE I certified in the near future.



Dr. Danny Peterson, MD
ED Ultrasound Coordinator

Simulation

The Emergency Medicine Staff Interdisciplinary Simulation program continues to grow and is established as one of the most developed continuing medical education programs for Emergency staff in the country. The weekly sessions gather Emergency physicians, Emergency nurses, respiratory therapists and pharmacists to participate in sessions that focus on enhancing teamwork skills, practicing procedural skills and expanding knowledge bases. Over 140 Emergency physicians and 500 nurses and respiratory therapists have participated in the last 6 years. The team is exposed to critical care scenarios and is encouraged to practice in real time the skills they will need to use in their daily practice of Emergency Medicine. The program is now expanding to collaborate with other specialties such as neonatology, obstetrics and gynecology and the acute stroke team to improve care and communication through the medical system. Our team of facilitators continues to expand and is now well recognized as valuable teachers for a variety of simulation courses. They have become speakers at international simulation events and are involved in multi-site resident research projects.

Clinical Pharmacology and Toxicology



Dr. Mark Yarema, MD
PADIS Medical Director

2016 was another successful year for the Poison and Drug Information Service (PADIS) and for Clinical Pharmacology and Toxicology in Calgary.

The new Section of Clinical Pharmacology and Toxicology (CPT) had major accomplishments in its first year. The Section was formally approved by the Calgary ZMAC on April 14 2016, and a proposal to the provincial government for a Royal College residency program in Clinical Pharmacology and Toxicology at the University of Calgary was approved on November 15 2016. The goals for 2017 are to obtain Royal College approval for the CPT residency with the goal of having our first resident start in July 2018, and complete formalization of the process for those physicians interested in CPT membership.

PADIS welcomed 38 residents from Emergency Medicine, Internal Medicine, Anesthesia, Pediatric Emergency Medicine and Critical Care Medicine for our popular Medical Toxicology rotation. This rotation involves a combination of bedside medical toxicology consultations in Calgary hospitals and small-group teaching sessions on management of common poisonings.

In 2016, the Medical Toxicology Clinic saw 25 patients. This monthly clinic was developed to provide evaluation, diagnosis, and management of adult patients in Alberta with toxic exposures, adverse drug events, follow care after hospitalization for poisonings, and interpretation of toxicology tests performed in the community. Common exposure this year included arsenic, lead, cobalt, carbon monoxide, and hydraulic fracturing by-products.

PADIS toxicologists had six abstracts accepted for presentations at the annual North American Congress of Clinical Toxicology in Boston. All abstracts were published in the August 2016 issue of Clinical Toxicology. In addition, PADIS toxicologists were authors on several manuscripts.

A 2016 collaboration between PADIS and the Alberta Adolescent Recovery Centre (AARC) was funded by a grant from the Alberta Innovates – Health Solutions Community Engagement and Conference Grant. This collaboration involved a monthly workshop series to Calgarians focusing on the dangers of substance abuse and the disease of addiction. Dr. Yarema spoke at three of these presentations, focusing on opioids and amphetamines.

PADIS also hired a new medical toxicologist, Dr. Morgan Riggan, in November 2016. Morgan is completing her medical toxicology fellowship in New York City and will be joining the PADIS team in July 2017.

Emergency Medicine Research



Andrew McRae, MD, PhD
Research Chief

The 2016 calendar year again saw substantial growth in scholarly output and research grant funding. The Department of Emergency Medicine continues to develop as a center of excellence and expertise in emergency department operations and quality improvement research, with project leadership from Drs. Lang, Innes, Andruchow, Dowling and McRae.

Projects funded by federal and provincial agencies have led to powerful findings regarding the optimal use of high-sensitivity troponin assays in the diagnosis of acute myocardial infarction, the utility of CT scanning or surgical intervention in the management of renal colic, and the utilization of CT scanning for patients with concussions or suspected pulmonary embolism.

Recently-completed multicenter studies have led to important findings on the incidence (and risk prediction of) serious adverse events among patients with syncope, COPD and acute heart failure. The FMC ED is currently enrolling patients in a randomized controlled trial of chemical vs. electrical cardioversion for symptomatic acute atrial fibrillation.

Upcoming studies in the Calgary Zone EDs include the evaluation of a treatment pathway for deep venous thrombosis using an age-adjusted D-dimer cutoff strategy, and a prospective study to identify risk factors that are predictive of prolonged post-concussion symptoms.

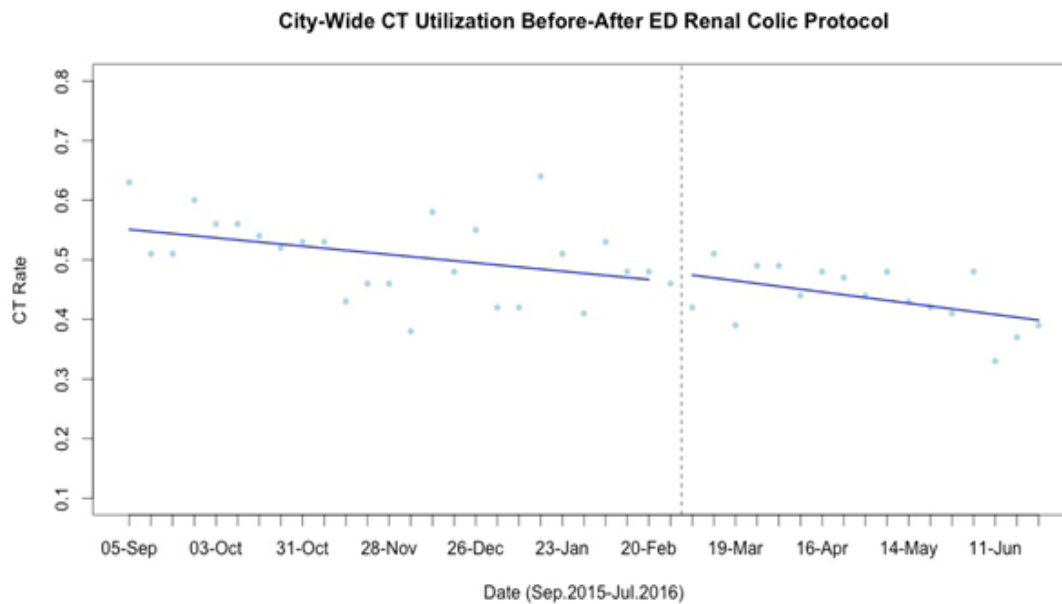
ED researchers continue to have productive collaborations with clinician-scientists from Clinical Neurosciences, Cardiovascular Sciences, Gastroenterology and Hematology.

Research Day 2016 had over 150 attendees. Dr. Paul Atkinson of Dalhousie University spoke eloquently on the reliability of research evidence, and a panel of investigators including Drs. James Huffman, Ian Walker, Catherine Patocka and Rachel Ellaway discussed the value of scholarly dissemination of educational innovations.

Katrina Koger continues to provide exemplary support to the research program. Dr. Heidi Boyda has continued to prove invaluable in her role as the departmental Research Coordinator. She will be joined in this role by Tristan Holotnak in early 2017. The FMC research assistant team continues to facilitate collection of high-quality data in the emergency department.

Renal Colic Project

The renal colic protocol process began in Nov of 2014. It was developed during the first half of 2015, regionally approved late in 2015, and implemented across all 4 Calgary sites between March and June of 2016. Our evaluation shows that CT use for patients with a discharge diagnosis of renal colic fell from about 65% in 2014 to 40-45% currently. The data suggest that protocol implementation at SHC was temporally associated with a 23% reduction in CT use (kudos to SHC); however, the time series plot below suggests, at a zone level, that the reduction in CT may have little to do with the actual protocol implementation, and the 2 (only 2) phone calls I have received from patients suggests to me that docs are not handing out the renal colic patient education packages (my cellphone # is on the bottom of the info sheet).



Whatever the reason for the improvement (best estimate=500 fewer scans/year) it would be great to try and sustain this, so the next time you see an uncomplicated renal colic patient, continue to think twice about whether a CT will lead to a better outcome for your patient. The protocol is available as a link from the renal colic order set and, at least at RGH, hard copies with patient education packages) are sitting on the desk at the intake workstation.

PRIHS Projects

1) Reassessment of Clinical Practices for Patient Presenting to the Emergency Department with Upper Gastrointestinal Bleeding:

To optimize the management of patients presenting to emergency with non-variceal upper gastrointestinal bleeding (UGIB), the Emergency Strategic Clinical Network is leading a provincial quality improvement initiative.

This project aims to optimize several key areas of UGIB management: (1) the use of a Glasgow-Blatchford based pathway for the disposition of patients, (2) increased access to urgent outpatient endoscopy, and (3) increased adherence to transfusion guidelines.

Within the Calgary Zone work is underway at the Foothills Medical Centre and Peter Lougheed Centre to evaluate local practice and implement recommendations. Foothills has already implemented an evidence-based disposition pathway developed in collaboration between EM and GI, and has created a capacity for urgent outpatient endoscopy. This work is supported by the development of a provincial surveillance cohort to establish provincial incidence, management, and clinical and health system outcomes.

2) Improving the Stewardship of Diagnostic Imaging Resources in Alberta Emergency Departments:

To optimize the appropriateness of head CT utilization for patients with mild traumatic brain injury and to reduce practice variation, the Emergency Strategic Clinical Network is leading a provincial knowledge translation project.

This project has two major initiatives: (1) Providing emergency physicians evidence-based decision support at the time of CT ordering, and (2) Providing confidential physician feedback on CT ordering practices.

This project was implemented in the Calgary Zone in August 2016, with every Emergency Physician being randomized to receive clinical decision support (CDS) for either Mild Traumatic Brain Injury, or suspected Pulmonary Embolism. In collaboration with Sunrise Clinical Manager, we successfully embedded CDS software within Calgary's regional ED information and management systems, such that, every time a Calgary ED physician attempts to place a CT order on an eligible minor TBI patient or suspected PE patient, a decision support algorithm will open in a new browser window, prompting the physician to follow evidence-based CT prediction rules.

Since launch, approximately 30% of relevant CT orders in the Calgary Zone have been preceded by the use of CDS. The first set of physician-specific utilization performance reports have been created and Emergency Physicians will continue to receive confidential reports three times a year on their use of CDS and CT ordering practices relative to their peers.

PRIHS 3

Evaluation of the Connect 2 Care (C2C) Team for Vulnerable Patients with Complex Needs

Background

Researchers at the University of Calgary's O'Brien Institute for Public Health have partnered with Calgary Urban Project Society (CUPS) and Alpha House to evaluate the Connect 2 Care (C2C) intervention for socially vulnerable patients with complex health needs. Socially vulnerable individuals, including those experiencing homelessness, have higher acute care utilization compared with the general population. Despite available primary care and social services, many have significant challenges accessing the services they need in the community. The C2C (formerly the Coordinated Care Team [CCT]) intervention aims to improve care coordination for socially vulnerable patients by bridging the gap between acute care and community services. This novel intervention combines elements of intensive case management with community outreach and navigation.

Initially launched November 1, 2015, C2C consists of 2 registered nurses, to be supplemented by first 2, then 4 navigators. Referrals are accepted from emergency departments, hospital units and community partners. The team will have expertise in chronic disease management, mental health and addictions, and extensive knowledge around social programs, community health, housing, and financial, transportation and legal resources.

Population

Referrals are accepted from emergency departments (ED), hospital units and community partners, for patients meeting the following criteria:

1. ≥ 18 years of age **AND**
2. Homeless or unstably housed **AND**
3. ≥ 3 ED/Urgent Care (UC) presentations, or ≥ 2 hospitalizations within the past year, **AND**
4. A history of one or more high-risk conditions (used by partner – Anansi Health):
 Substance use disorder; mental illness with functional impairment (depression, anxiety disorder, bipolar disorder, psychotic disorder); congestive heart failure; diabetes with HbA1c $>9\%$; chronic obstructive pulmonary disease; asthma; cardiovascular disease; uncontrolled hypertension with end-organ damage; end-stage liver disease; end-stage kidney disease

Evaluation Objectives

We will evaluate the C2C intervention using the Donabedian framework of *structure, process, and outcome*. To assess *structure*, we will document the program's context, resources, and partner supports. *Process* indicators include: referrals to primary care, housing, addiction and mental health programs. *Outcome* measures include: ED visits, hospitalizations, costs, quality of life, self-reported health status, patient, staff, and partner experiences.

The objectives of this evaluation are:

1. To document the structure and process of the C2C model of care throughout the phases of implementation.
2. To determine the effectiveness of the C2C program in reducing acute care utilization and improving patient-reported outcomes.
3. To assess patient, staff, and partner experience with the C2C.
4. To explore the links among structure and processes that lead to health and program outcomes, both positive and negative.

Significance

The development and evaluation of interventions to improve the care of socially vulnerable and medically complex patients has been identified as a priority locally, provincially and nationally. This population often receives high-cost, high-intensity care in acute care facilities and suffers poor health and health outcomes. A dedicated acute care-linked community outreach strategy that coordinates care for socially vulnerable patients is needed to resolve existing care gaps and advance the health of this high-risk population. The work detailed in this proposal will measure the effectiveness of such an intervention, the C2C, which integrates two models of care and bridges the gap between acute care and the community. Policy makers require a comprehensive evaluation that provides detailed information needed to sustain and scale implementation across Alberta and more broadly across Canada.

Ongoing Research Work and Grants of 2016

1. **PROJECT:** Reassessment of Clinical Practices for Patient Presenting to the Emergency Department with Upper Gastrointestinal Bleeding.
INVESTIGATORS: Lang ES, Bullard MJ, Ghosh S, Hebert MA, Innes G, Kaplan GG, McRae AD, Novak K, Zanten SV, Dowling S.
FUNDING AGENCY: Alberta Innovates – Health Solutions PRIHS
TOTAL AMOUNT GRANTED: \$699,000
PERIOD: 2015-2018
2. **PROJECT:** Improving the Stewardship of Diagnostic Imaging Resources in Alberta Emergency Departments
INVESTIGATORS: Lang ES, McRae A, Holroyd B, Rowe B, Emery D, Andruchow J, Bullard M, Sevvick R.
FUNDING AGENCY: Alberta Innovates Health Solutions (AIHS) - Partnership for Research and Innovation in the Health System (PRIHS)
TOTAL AMOUNT GRANTED: \$750,000
PERIOD: 2014-2018
3. **PROJECT:** Empirical Validation of Emergency Department Crowding Metrics
INVESTIGATORS: McRae A, Andruchow J, Innes G, Lang E, Rosychuk R, Rowe B, Schull M.
FUNDING AGENCY: Peer Review Committees and Mandates - Open Operating Grant Program (OOGP)
TOTAL AMOUNT GRANTED: \$197,073
PERIOD: 2014-2016
4. **PROJECT:** Empirical Validation of Emergency Department Crowding Metrics
INVESTIGATORS: McRae A, Andruchow J, Innes G, Lang E, Rosychuk R, Rowe B, Schull M.
FUNDING AGENCY: University of Calgary, Faculty of Medicine Seed Grants
TOTAL AMOUNT GRANTED: \$20,000
PERIOD: 2014-2016
5. **PROJECT:** Identifying the Optimal Treatment of Emergency Department Patients with Renal Colic
INVESTIGATORS: Andruchow J, Innes G, Grafstein E, Law M, Carlson K, Dickhoff P, Ward D, Lang E, Teichman J, McRae A, Dotchin J, Cuthbertson L.
FUNDING AGENCY: MSI Foundation
TOTAL AMOUNT GRANTED: \$98,000
PERIOD: 2015-2016
6. **PROJECT:** Utility of a clinical diagnostic algorithm to reduce CT imaging for ED patients with suspected Renal Colic
INVESTIGATORS: Andruchow J, Innes G.

FUNDING AGENCY: KTA

TOTAL AMOUNT GRANTED: \$25,000

PERIOD: 2014-2016

7. **PROJECT:** D-dimer testing, tailored to clinical pretest probability, to reduce use of CT pulmonary angiography in suspected pulmonary embolism: A management study. (PE Graduated D-dimer [PEGeD] Study)

INVESTIGATORS: Kearon C, Afilalo M, Bates S, Carrier M, Douketis J, Gafni A, Hirsch A, Julian J, Kahn S, Kovacs M, Lang E, Lazo-Langner A, Le Gal G, Linkins L, Rodger M, Schulman S, Shivakumar S, Takach-Lapner S, Wells P, Wu C.

FUNDING AGENCY: Peer Review Committees and Mandates - Open Operating Grant Program (OOGP)

TOTAL AMOUNT GRANTED: \$329,928

PERIOD: 2013-2017

8. **PROJECT:** D-dimer testing, tailored to clinical pretest probability, to minimize initial and follow-up ultrasound testing in suspected deep vein thrombosis: A management study.

INVESTIGATORS: Kearon C, Afilalo M, Bates S, Carrier M, Douketis J, Gafni A, Julian J, Kahn S, Kovacs M, Lang E, Lazo-Langner A, Le Gal G, Linkins L, Rodger M, Schulman S, Shivakumar S, Wells P, Wu C.

FUNDING AGENCY: Peer Review Committees and Mandates – Open Operating Grant Program (OOGP)

TOTAL AMOUNT GRANTED: \$424,757

PERIOD: 2013-2016

9. **PROJECT:** The Canadian Emergency Departments team initiative (CETI) of mobility after an injury in seniors.

INVESTIGATORS: Emond M, Griffith L, Lee J, Perry J, Sirios M-J, Veillette N, Verreault R, Balion C, Daoust R, Lamontagne M, Lang E, Le Sage N, Liu B, Moore L, Morin J, Naglie G, Ouellet M, Raina P, Ryan D, Tarride J-E, Widling L, Worster A.

FUNDING AGENCY: Emerging Team Grant: Alliances in Mobility in aging

TOTAL AMOUNT GRANTED: \$1,125,000

PERIOD: 2010-2016

10. **PROJECT:** A Multicenter Prospective Cohort Study of Adverse Events Among Patients Discharged with Sentinel Cardiovascular Emergency Department Diagnoses

INVESTIGATORS: Calder L, Borgundvaag B, Daoust R, Emond M, Forster A, Lang E, Perry J, Rowe B, Sivliotti M, Stiell I, Taljaard M, Thiruganasambandamoorthy V, Wells G.

FUNDING AGENCY: Canadian Institutes of Health Research (CIHR) – Operating Grant

TOTAL AMOUNT GRANTED: \$428,830

PERIOD: 2012-2016

11. **PROJECT:** CanVECTOR (Canadian Venous Thromboembolism Clinical Trials and Outcomes Research) Network

INVESTIGATORS: Kahn S, Rodger M, Lang E, et al.

FUNDING AGENCY: ICRH Community Development Program Grants
TOTAL AMOUNT GRANTED: \$150,000
PERIOD: 2015-2016

12. **PROJECT:** Canadian Atrial Fibrillation Stroke Prevention (CAF-SPIN)
INVESTIGATORS: Birnie D, Dorian P, Healey J, Sheldon R, Tang A, Andrade J, Atzema C, Connolly S, Dolovich L, Essebag V, Exner D, Gladstone D, Goeree R, Graham I, Ha A, Hart R, Hill M, Huynh T, Ivers N, Khairy P, Krahn A, Mcrae A, Meshkat N, Morillo C, Nieuwlaat R, Parkash R, Philippon F, Quinn F, Redfearn D, Sandhu R, Sharma M, Talajic M, Thabane L, Tobe S, Verma A, Whitlock R, Wilton S.
FUNDING AGENCY: Canadian Institutes of Health Research (CIHR) Network Grants
TOTAL AMOUNT GRANTED: \$4,350,000
PERIOD: 2013-2018
13. **PROJECT:** A Randomized, Controlled Comparison of Electrical versus Pharmacological Cardioversion for Emergency Department Patients with Recent-Onset Atrial Fibrillation
INVESTIGATORS: Perry J, Birnie D, Borgunvaag B, Brison R, Hohl C, Macle L, Mcrae A, Rowe B, Sivlotti M, Stiell I, Vadeboncoeur A, Wells G.
FUNDING AGENCY: Canadian Institutes of Health Research (CIHR) Open Operating Grants
TOTAL AMOUNT GRANTED: \$414,179
PERIOD: 2015-2018
14. **PROJECT:** Optimal Management of Low-risk Syncope Patients
INVESTIGATORS: Thiruganasamandamoorthy V, Sivlotti M, Morris J, Hohl C, Huang P, Lesage N, Krahn A, McRae A, Rowe B, Morillo C, Taljaard M, Kednappa Thavorn J, Brehaut J, Stacey D.
FUNDING AGENCY: Network for Centres of Excellence (NCE), Canadian Arrhythmia Network (CANet)
TOTAL AMOUNT GRANTED: \$730,344
PERIOD: 2015-2018
15. **PROJECT:** Enhanced Multidisciplinary Care for Inner City Patients with High Acute Care Use
INVESTIGATORS: Salvalaggio G, McCabe C, McRae A, et al.
FUNDING AGENCY: Alberta Innovates – Health Solutions (PRIHS)
TOTAL AMOUNT GRANTED: \$750,000
PERIOD: 2015-2018
16. **PROJECT:** Stewardship of Emergency Department CT Scan Utilization
INVESTIGATORS: Lang E, McRae A, Andruchow J, Innes G.
FUNDING AGENCY: Alberta Innovates – Health Solutions (PRIHS)
TOTAL AMOUNT GRANTED: \$750,000
PERIOD: 2014-2017
17. **PROJECT:** A Randomized Controlled Trial of Gender Effects on Interview Scores
INVESTIGATORS: Walker I, McLaughlin K, Raman M.

FUNDING AGENCY: Office of Health and Medical Education Scholarship (OHMES)
TOTAL AMOUNT GRANTED: \$6,840
PERIOD: 2015 – 2016

18. **PROJECT:** Time is Brain: A Systematic Review of Emergency Department Interventions to Reduce Door to Needle Times in Acute Ischemic Stroke

INVESTIGATORS: Lang E *et al.*

FUNDING AGENCY: Emergency Strategic Clinical Network (ESCN) – Systematic Review Grant

TOTAL AMOUNT GRANTED: \$7,500

PERIOD: 2016 – 2017

19. **PROJECT:** The Canadian Head CT Patient Decision Aid Consensus Study - Adaptation of two decision aids supporting adult and pediatric mild traumatic brain injury patients' decisions about head CTs: a pan-Canadian consensus meeting and rapid prototyping with input from an expert panel to produce Canadian versions of two American head CT decision aids

INVESTIGATORS: Archambault P, Gagnon I, Green R, Zemek R, Curran J, Gagnon MP, Gravel J, Légaré F, Ouellet MC, Plante P, Leblanc A, Le Sage N, Lang E, Sauvé L, Witteman H.

FUNDING AGENCY: Canadian Traumatic Brain Injury Research Consortium (CTRC)

TOTAL AMOUNT GRANTED: \$25,000

PERIOD: 2016 – 2018

20. **PROJECT:** Validation of a clinical decision rule integrating the use of biomarkers for early detection of persistent symptoms after a MTBI

INVESTIGATORS: Le Sage N, Archambault P, Berthelot S, Chauny JM, Clément J, De Guise E, Emond M, Frenette J, Lang E, Lee J, Mercier É, Moore L, Ouellet MC, Perry J, Cameron PA (coll.), Swaine B (coll.)

FUNDING AGENCY: Canadian Institutes of Health Research (CIHR)

TOTAL AMOUNT GRANTED: \$760,676

PERIOD: 2016 – 2018

21. **PROJECT:** Connecting Emergency Departments with Community services to prevent mobility losses in pre-frail & frail Seniors (CEDeComS)

INVESTIGATORS: Emond M, Aubertin MC, Berg KO, Bissonnette L, Daoust R, Eagles D, Elazhary N, Lang ES, Lee JS, Provencher V, Salbach N, Sirois M, Brousseau A, Carpenter CR, Costa AP, de Wit K, Giguère A, Juneau L, Lamontagne M, Le Sage N, Melady D, Molnar FJ, Morin M, Ouellet M, Perry JJ, Veillette N, Wilding LJ.

FUNDING AGENCY: Canadian Institutes of Health Research (CIHR)

TOTAL AMOUNT GRANTED: \$1,643,676

PERIOD: 2016-2019

22. **PROJECT:** Social Determinants of Post-discharge readmissions, emergency department visits, and mortality in medical inpatients

INVESTIGATORS: Amin Ghali W, Musto R, Falvo N, Godley J, Lang ES, Manns B, Nguyen

V, Parrilla Lopez M, Rabi D, Sajobi T, Tang K.

FUNDING AGENCY: Canadian Institutes of Health Research (CIHR – PHSI)

TOTAL AMOUNT GRANTED: \$142,000

PERIOD: 2016-

23. **PROJECT:** Pain Management from Skin-Breaking Procedures in Neonates: Knowledge Synthesis and Practice Guidelines

INVESTIGATORS: Shah V, Lacaze-Masmonteil T, Taddio A, Harrison D, Lang ES, Ng E, Pillai Riddell R, Robson K.

FUNDING AGENCY: Canadian Institutes of Health Research (CIHR)

TOTAL AMOUNT GRANTED: \$100,000

PERIOD: 2016-

24. **PROJECT:** Process Improvements at Hospital Emerg Departments.

INVESTIGATORS: Bijvank M, Bischak D, Sun Z, Lang E.

FUNDING AGENCY: AIHS - PRIHS

TOTAL AMOUNT GRANTED: \$7,040

PERIOD: 2015-2016

25. **PROJECT:** Characterization of Transient Ischemic Attack (TIA) care in Alberta Emergency Departments (ED)

INVESTIGATORS: Lang E, Patocka C, Leong M.

FUNDING AGENCY: Quality Improvement & Clinical Research (QuICR) Thomas E. Feasby Fellowships & Studentships

TOTAL AMOUNT GRANTED: \$8000

PERIOD: 2016

26. **PROJECT:** CanVECTOR Research Start-up Funding

INVESTIGATORS: Lang E, Suryanarayan, Prajapati.

FUNDING AGENCY: CanVECTOR Research Network

TOTAL AMOUNT GRANTED: \$2,500

PERIOD: 2016

27. **PROJECT:** An Assessment of the Impact of Time to Paramedic Treatment on Patient Outcomes in the Alberta Emergency Medical Services System: Building a Comprehensive Database and Identifying Patient Priorities in Outcomes

INVESTIGATORS: Blanchard I, Doig CJ.

FUNDING AGENCY: Alberta Innovates – SPOR Graduate Studentship

TOTAL AMOUNT GRANTED: \$30,000

PERIOD: 2016 - 2017

Publications in 2016

1. Mohamed M, Ugarte-Torres A, Groshaus H, Rioux K, Yarema M. Lead poisoning from a ceramic jug presenting as recurrent abdominal pain and jaundice. *AGC Case Reports Journal*. 2015(3:2).
2. Hoegberg LCG, Bania TC, Lavergne V, Bailey B, Turgeon AF, Thomas SHL, Morris M, Miller-Nesbit A, Megarbane B, Magder S, Gosselin S, Lipid Emulsion Workgroup. Systematic review of the effect of intravenous lipid emulsion therapy for local anesthetic toxicity. *Clinical Toxicology*. 2016.
3. Levine M, Hoffman RS, Lavergne V, Stork CM, Graundins A, Chuang R, Stellpflug SJ, Morris M, Miller-Nesbitt A, Gosselin S, AACT Lipid Emulsion Workgroup. Systematic review of the effect of intravenous lipid emulsion therapy for non-local anesthetics toxicity. *Clinical Toxicology*. 2016.
4. Lang E. Some risk scores plus high-sensitivity troponin may identify patients with chest pain for early discharge. *Annals of Internal Medicine*. 2016. JC22.
5. Lucyk SN, Yarema MC, Sivilotti MLA, Johnson DW, Nettel-Aguirre A, Victorino C, Bailey B, Dart RC, Heard K, Spyker D, Rumack BH. Outcomes of patients with premature discontinuation of the 21-H intravenous N-Acetylcysteine protocol after acute acetaminophen overdose. *J Emerg Med*. 2016. Apr;50(4):629-637.
6. Berthelot S, Lang ES, QUan H, Stelfox HT. Development of a hospital standardized mortality ratio for Emergency Department Care. *Annals of Emergency Medicine*. 2016. 67(4):517-524.
7. McMurty CM, Taddio A, Noel M, Antony MM, Chambers CT, Asmundson GJ, Pillai Riddell R, Shah V, MacDonald NE, Rogers J, Bucci M, Mousmanis P, Lang E, Halperin S, Bowles S, Halpert C, Ipp M, Rieder MJ, Robson K, Uleryk E, Votta Bleeker E, Dubey V, Hanrahan A, Lockett D, Scott J. Exposure-based interventions for the management of individuals with high levels of needle fear across the lifespan: a clinical practice guideline and call for further research. *Cognitive Behavior Therapy*. 2016. 45(3):217-235.
8. MacLeod G, Mink M, Yarema M, Chuang R. Digoxin toxicity: case for retiring its use in elderly patients? *Canadian Family Physician*. 2016. 62(March):223-225, 227-228.
9. Rosenfield D, Eltorki M, VandenBerg S, Allain D, Freedman SB, Beno S. Single-use detergent saps a retrospective multicenter Canadian review of emergency department cases. *Pediatric Emergency Care*. 2016. 00(00)1-4.
10. Parker SI, Benzies KM, Hayden KA, Lang ES. Effectiveness of interventions for adult peripheral intravenous catheterization: A systematic review and meta-analysis of randomized controlled trials. *International Emergency Nursing*. 2016. 05(004).
11. Sahota IS, Lang ES. Reducing low-value interventions in the emergency department: you may be the problem. *CJEM*. 2016. Aug 9:1-4.

12. Wadhwani A, Guo L, Saude E, Els H, Lang E, McRae A, Bhayana D. Intravenous and oral contrast vs intravenous contrast alone computed tomography for the visualization of appendix and diagnosis of appendicitis in adult emergency department patients. *Can Assoc Radiol J*. 2016. 67(3):234-241.
13. Michaud A, Lang E. Leg lift Valsalva maneuver for treatment of supraventricular tachycardias. *CJEM*. 2016. Aug(12):1-3.
14. Yarema MC, Green JP, Sivilotti MLA, Johnson DW, Nettel-Aguirre A, Victorino C, Spyker DA, Rumack BH. Can a serum acetaminophen concentration obtained less than 4 hours post-ingesting determine which patients do not require treatment with acetylcysteine? *Clinical Toxicology*. 2016.
15. Polsky Z, Lang E, Rodin I, Sinnarajah A, Fung T, Thomas B. Preliminary Results for the Canary in the Coal Mine Study: Does Palliative Care Reduce Emergency Department Utilization? Leaders in Medicine Research Symposium, University of Calgary, Calgary, Alberta, October 28, 2016. Poster Presentation. 28/10/2016- Leaders in Medicine Symposium- Best Poster Presentation Award, Group I.
16. Patterson DP, Higgins S, Lang ES, Runyon MS, Barger LK, Studnek JR. Evidence-based guidelines for fatigue risk management in EMS: Formulating research questions and selecting outcomes. 2016. 16 Jun.
17. Mithani S, Dong K, Wilmott A, Podmoroff H, Lalani N, Rosychuk RJ, Chuang R, Yarema MC. A cohort study of unstable overdose patients treated with intravenous lipid emulsion therapy. *CJEM*. 2016. DOI 10.1017.
18. Casaubon LK, Boulanger JM, Glasser E, Blacquiére D, Boucher S, Brown K, Goddard T, Gordon J, Horton M, Lalonde J, LaRivière C, Lavoie P, Leslie P, McNeill J, Menon BK, Moses B, Penn M, Perry J, Snieder E, Tymianski D, Foley N, Smith EE, Gubitz G, Hill MD, Lindsay P; Heart and Stroke Foundation of Canada Canadian Stroke Best Practices Advisory Committee. Canadian Stroke Best Practice Recommendations: Acute inpatient stroke care guidelines. Update 2015. *Int J Stroke*. 2016. Feb;11(2):239-252.
19. Hartling L, Milne A, Foisy M, Lang ES, Sinclair D, Klassen TP, Evered L. What works and what's safe in pediatric emergency procedural sedation: an overview of reviews. *Acad Emerg Med*. 2016 May;23(5):519-30.
20. Harris DR, Lang ES, Perry JJ, Morrison LJ. Treatment of Stroke in Canadian Emergency Departments: Time to be Leaders. *CJEM*. 2016 Jul 5:1-3.
21. Thiruganasambandamoorthy V, Kwong K, Wells GA, Sivilotti ML, Mukarram M, Rowe BH, Lang E, Perry JJ, Sheldon R, Stiell IG, Taljaard M. Development of the Canadian Syncope Risk Score to predict serious adverse events after emergency department assessment of syncope. *CMAJ*. 2016 Sep 6;188(12):E289-98.
22. Stiell IG, Artz JD, Lang ES, Sherbino J, Morrison LJ, Christenson J, Perry JJ, Topping C, Woods R, Green RS, Lim R, Magee K, Foote J, Meckler G, Mensour M, Field S, Chung B, Kuuskne M, Ducharme J, Klein V, McEwen J. An Environmental Scan of Academic Emergency Medicine at

the 17 Canadian Medical Schools: Why Does this Matter to Emergency Physicians? CJEM. 2016 Jul 21:1-8.

23. Brousseau AA, Émond M, Sirois MJ, Daoust R, Griffith LE, Lang E, Lee J, Perry JJ, Ouellet MC, Verreault R, Berthelot S, Mercier É, Allain-Boulé N, Boucher V, Tardif PA, Le Sage N. Comparison of functional outcomes in elderly who have sustained a minor trauma with or without head injury: a prospective multicenter cohort study. CJEM. 2016 Sep 9:1-9.
24. Boyd JM, Burton R, Butler BL, Dyer D, Evans DC, Felteau M, Gruen RL, Jaffe KM, Kortbeek J, Lang E, Loughheed V, Moore L, Narciso M, Oxland P, Rivara FP, Roberts D, Sarakbi D, Vine K, Stelfox HT. Development and Validation of Quality Criteria for Providing Patient- and Family-centered Injury Care.. Ann Surg. 2016 Sep 8.
25. Lenz K, McRae A, Wang D, Higgins B, Innes G, Cook T, Lang E. Slow or swift, your patients' experience won't drift: absence of correlation between physician productivity and the patient experience. CJEM. 2016 Nov 7:1-9.
26. Patterson PD, Higgins JS, Lang ES, Runyon MS, Barger LK, Studnek JR, Moore CG, Robinson K, Gainor D, Infinger A, Weiss PM, Sequeira DJ, Martin-Gill C. Evidence-Based Guidelines for Fatigue Risk Management in EMS: Formulating Research Questions and Selecting Outcomes. Prehosp Emerg Care. 2016 Nov 18:1-8.
27. Stiell IG, Perry JJ, Clement CM, Brison RJ, Rowe BH, Aaron SD, McRae A, Borgundvaag B, Calder LA, Forster AJ, Wells GA. Prospective and Explicit Clinical Validation of the Ottawa Heart Failure Risk Scale, With and Without Use of Quantitative NT-proBNP. Acad Emerg Med. 2016 Dec 15
28. Innes GD, Scheuermeyer FX, Law MR, McRae AD, Weber BA, Boyda HN, Lonergan K, Andruchow JE. Sex-related Differences in Emergency Department Renal Colic Management: Females Have Fewer Computed Tomography Scans but Similar Outcomes. Acad Emerg Med. 2016 Oct;23(10):1153-1160.
29. McRae AD, Taljaard M, Weijer C. Cluster-randomized trials: A closer look. Clin Trials. 2016 Jun;13(3):294-300.
30. Innes GD, Scheuermeyer FX, Law MR, McRae AD, Weber BA, Boyda HN, Lonergan K, Andruchow JE. Sex-related Differences in Emergency Department Renal Colic Management: Females Have Fewer Computed Tomography Scans but Similar Outcomes. Acad Emerg Med. 2016 Oct;23(10):1153-1160.
31. Innes GD, Grafstein E, McRae A, Wang D, Lang E, Andruchow J. Diagnostic and prognostic value of hydronephrosis in emergency department patients with acute renal colic. Can J Emerg Med 2016; 18:S51
32. Innes GD, Andruchow J, Law M, Grafstein E, Lonergan K, Dickhoff P, McRae A, Lang E. Diagnostic and Prognostic Value of Hydronephrosis in Emergency Department Patients with Acute Renal Colic. Academic Emerg Med 2016;23:S48-49.
33. Innes GD, Andruchow J, Law M, Grafstein E, Lonergan K, Dickhoff P, McRae A, Lang E. Diagnostic and Prognostic Value of Hydronephrosis in Emergency Department Patients with

Acute Renal Colic. Presented at the Society for Academic Emergency Medicine Annual Scientific Symposium, New Orleans, LA. May 13.

34. Innes GD, Scheuermeyer F, Boyda H, Law M, Wang D, Dickhoff P, Weber P, Andruchow J. Emergency Department Management of Renal Colic; Does Gender Matter. Presented at the Society for Academic Emergency Medicine Annual Scientific Symposium, New Orleans, LA. May 13.
35. Innes GD, Marsden J, Law M, Kalla D, Stenstrom R, Grafstein E. Impact of Physician Payment Mechanism on Wait Times and ED Length of Stay. Presented at the Canadian Association of Emergency Physicians Annual Scientific Symposium, Quebec City, PQ. June 5.
36. Innes GD, Marsden J, Law M, Kalla D, Stenstrom R, Grafstein E. Impact of Physician Payment Mechanism on Wait Times and ED Length of Stay. *Can J Emerg Med* 2016; 18:S72.
37. Innes GD, Scheuermeyer F, Boyda H, Law M, Wang D, Dickhoff P, Weber P, Andruchow J. Emergency Department Management of Renal Colic; Does Gender Matter. *Academic Emerg Med* 2016;23:S252-53.
38. Innes GD, Andruchow J, McRae A, Lang E. Predictors of treatment failure in renal colic patients discharged from the emergency department, at the Canadian Association of Emergency Physicians Annual Scientific Symposium, Quebec City, PQ.
39. Grigat M, Innes GD, Andruchow J, McRae A, Sevvick R, Lang E. Variation in CT ordering for emergency department patients with minor head injury. *Can J Emerg Med* 2016; 18:S38.
40. Burles K, Wang D, Grigat M, Senior K, Innes GD, Andruchow J, Lang E, McRae A. Can you trust administrative data? Accuracy of ICD-10 codes for diagnosis of pulmonary embolism, presented at the Society for Academic Emergency Medicine Annual Scientific Symposium, New Orleans, LA. Apr. 12.
41. Grafstein E, Innes GD, Scheuermeyer FX, Sharma D, Siddoo A, Stenstrom R. The Utility of an Inpatient diagnosis-derived Charlson Comorbidity Index to Create an Emergency Department Workload Model. *Can J Emerg Med* 2016; 18:S59-60.
42. Grigat M, Innes GD, Andruchow J, McRae A, Sevvick R, Lang E. Variation in CT ordering for emergency department patients with minor head injury. *Academic Emerg Med* 2016;23:S49.
43. Grafstein E, Sharma D, Aggarwal B, Innes GD, Stenstrom R. A Novel Administrative Database Solution for Capturing ED Patient Comorbidity- the Derived Charlson Comorbidity Index. *Can J Emerg Med* 2016; 18:S95.
44. Holroyd BR, Rosychuk R, Jelinski S, McCabe C, Bullard M, Rowe BH, Innes GD, Niu S. Is Triage Score a Valid Measure of Emergency Department Case Mix? *Can J Emerg Med* 2016; 18:S98.
45. McRae A, Yunqi Jil, Wang D, Southern D, Kavsak P, DeKoning L, Lang E, Innes GD, Andruchow J. Derivation of a 2-Hour High-Sensitivity Troponin T Algorithm for Rapid Rule-Out of Acute Myocardial Infarction in Emergency Department Chest Pain Patients. Presented at the Society for Academic Emergency Medicine Annual Scientific Symposium, New Orleans, LA.

46. Burles K, Wang D, Grigat M, Innes GD, Andruchow J, Lang E, McRae A. Can you trust administrative data? Accuracy of ICD-10 codes for diagnosis of pulmonary embolism, at the Canadian Association of Emergency Physicians Annual Scientific Symposium, Quebec City, PQ
47. Burles K, Wang D, Grigat M, Lang E, Innes GD, Andruchow J, McRae A. Can we use administrative data to define an emergency department population at risk for pulmonary embolism? Development and validation of an algorithm to identify a research population. *Can J Emerg Med* 2016; 18:S35-36.
48. McRae A, Yunqi J, Wang D, Southern D, Kavsak P, DeKoning L, Lang E, Innes GD, Andruchow J. Derivation of a 2-Hour High-Sensitivity Troponin T Algorithm for Rapid Rule-Out of Acute Myocardial Infarction in Emergency Department Chest Pain Patients. *Academic Emerg Med* 2016;23:S37.
49. Huffman JL., McNeil G, Bismilla Z., Lai A. Essentials of Scenario Building for Simulation-Based Education. In *Comprehensive Healthcare Simulation: Pediatrics*. 2016. (1st ed., pp. 19–29).
50. Huffman J, Duncan J, Antal J, Whalen-Browne, A. STARS Mobile Simulation Education Program Evaluation and Needs Assessment. *Air Medical Journal*. 2016. 35(5). 286.
51. Lucyk S, Nelson L. Consequences of unsafe prescribing of transdermal fentanyl. *CMAJ*. 2016;188(9):638-9.
52. Sun G, Yarema M. Ethylene glycol intoxication. *Can J Gen Int Med* 2016;11(1):48-50.
53. Ruzycki S, Yarema M, Dunham M, Sadrzadeh H, Tremblay A. Intranasal Fentanyl Intoxication Leading to Diffuse Alveolar Hemorrhage. *J. Med. Toxicol.* 2016 12:185–188.
54. Ruzycki S, Yarema M. Five things to know about fentanyl misuse. *CMAJ* 2016 June 14; 188(9):673
55. Yarema MC, Green JP, Sivilotti MLA, Johnson DW, Nettel-Aguirre A, Victorino C, Spyker DA, Rumack BH. Can a serum acetaminophen concentration obtained less than 4 hours post-ingestion determine which patients do not require treatment with acetylcysteine? *Clin Toxicol* 2016; DOI: 10.1080/15563650.2016.1247959
56. Mithani S, Dong K, Wilmott A, Podmoroff H, Lalani N, Rosychuk R, Chuang R, Yarema M. A Cohort Study of Unstable Overdose Patients Treated with Intravenous Lipid Emulsion Therapy. *Can J Emerg Med* 2016; DOI 10.1017/cem.2016.396.
57. Ross M, Walker I, Raman M, Cooke L, McLaughlin. “Impact of Gender on MMI Performance.” *Academic Medicine*, in press 2016
58. Bajaj S, Myhre D, Walker I, Ellaway R. Social accountability in medical school admissions (SAMSA), research protocol for a BEME systematic review. *Best Evidence Medical Education (BEME)*. Feb 2016
59. Roze des Ordons, Doig CJ, Couillard P & Lord J. From communication skills to skillful communication – a longitudinal integrated curriculum for critical care fellows. Under revision with *Academic Medicine*, Feb 2016.

60. Roze des Ordon A, Couillard P, Doig C, Boucher P, Lord J. Development and implementation of a simulation-based communication curriculum for critical care medicine fellows. Poster. ISICEM, Brussels. 2016.
61. McKenna P, Thoma B, Milne K, Bond C. Ultrasound during critical care simulation: a randomized crossover study. CJEM. 2016. Oct 26:1-5.
62. Purdy E, Thoma B, Milne K, Bond C. Hypertonic saline in severe traumatic brain injury: a systematic review and meta-analysis of randomized controlled trials. CJEM. 2016 Sep;18(5):379-84. doi: 10.1017/cem.2016.374.
63. Luckett-Gatopoulos S, Thoma B, Milne K, Bond C. Regional Nerve Blocks for Hip and Femoral Neck Fractures: A Systematic Review. CJEM. 2016 Jul;18(4):296-300. doi: 10.1017/cem.2016.332.
64. Lin K, Dowling SK. Ultrasonography versus computed tomography for initial investigations of suspected nephrolithiasis. CJEM. 2016 Jan;10.1017/cem.2015.110.

Current Emergency Medicine Notable Mentions

1. Conferences, Workshops, and Grand Rounds

- Dr. Scott Lucyk. North American Congress of Clinical Toxicology. Boston, MA. September, 2016.
- Dr. Scott Lucyk. Invited speaker to present “The Opioid Epidemic” (50 minute presentation to all conference attendees), “Toxicology Cases” (small group breakout sessions, 2 x 50 minute sessions) at Saskatchewan Emergency Medicine Annual Conference (SEMAC) VIII, Oct 14-15, 2016, Regina, SK
- Dr. Scott Lucyk. Department of Critical Care Medicine Grand Rounds, University of Calgary, Calgary, Alberta, September 7, 2016. Presentation on “Hyperthermic Syndromes: The Hot and Agitated Toxicology Patient”
- Dr. Scott Lucyk. Department of Emergency Medicine Grand Rounds, University of Alberta, Edmonton, Alberta, May 3, 2016. Presentation on “Alcohol Withdrawal: Approach to Management in the ED”.
- Dr. Scott Lucyk. Department of Emergency Medicine Grand Rounds, University of Alberta, Edmonton, Alberta, May 3, 2016- 3 hours resident teaching session to discuss common toxicology presentations.
- Dr. Scott Lucyk. Presentation to healthcare professionals (including MDs, nurses, paramedics) from Banff and Canmore, Banff, AB, March 2, 2016. "Emerging Drugs of Abuse"

- Lucyk, S, Stevens B, Wilson, C. “Current Events”: Hepatotoxicity in the Setting of Silver Ingestion from Homemade Electrolysis Setup.
- Dr. Ryan Deedo University of Calgary, “Rural Emergency medicine conference” Banff, AB “Medical Communications in the Emergencies.” Jan 22, 2016
- Dr. Ryan Deedo. University of Calgary, “Rural Emergency medicine conference” Banff AB “Debriefing in the Emergency Department.” Jan 23, 2016
- Dr. Ryan Deedo Canadian Air Ambulance Medical Direction meeting “Pre-hospital Blood Transfusion,” and “Early Automated Dispatch.” May 26 and 27, 2016
- Dr. Ryan Deedo CHEST 2016, “Clinical/Logistical Implications for Medical Transport,” Los Angeles.

October 23, 2016

- Dr. Nadim Lalani. Presented rounds in Saskatoon on costs of care Aug 31st. 2016
- Dr. Nadim Lalani. Presented poster at CAEP 2016 on Identifying Candidates for ECMO in Saskatchewan
- Dr. Nadim Lalani. Invited speaker on mentoring leaders. CAEP2017
- Dr. Joe Vipond Alberta Ecotrust Environmental Gathering Lecture: That'll Never Happen: How to ignore the critics and create monumental change. Feb 26, 2016
- Dr. Joe Vipond. Kathmandu University: Dept. of Environmental Science: Time for Radical Change: a Canadian model for air pollution advocacy in Nepal. Apr 18. 2016
- Dr. Joe Vipond. Tribhuvan University: Dept. of Environmental Science: Time for Radical Change: a Canadian model for air pollution advocacy in Nepal. Apr 20, 2016
- Dr. Joe Vipond. Patan Hospital Grand Rounds: Time for Radical Change: a Canadian model for air pollution advocacy in Nepal. Apr 22. 2016
- Dr. Joe Vipond. Clean Up Nepal: Time for Radical Change: a Canadian model for air pollution advocacy in Nepal. Apr 30. 2016
- Dr. Joe Vipond. Telus Spark Adults Only Night: Goodbye coal. May 19. 2016
- Dr. Joe Vipond. 2016 CAEP Conference: Advocacy track: Time Windows and Taking Action: successful advocacy for a healthy climate. June 8. 2016
- Dr. Joe Vipond. U of A Med School Class of 96 Reunion: Time for Change: Advocacy to make the impossible, possible. Sept 3. 2016
- Dr. Joe Vipond. Council of Canadian Edmonton Chapter climate conference: Five things you can do to change the world. Nov 4. 2016
- Dr. Joe Vipond. David Suzuki Foundation (Edmonton): Health and Climate Change--how MDs can help tackle our biggest global health threat. Nov 10. 2016

- Dr. Joe Vipond. University of Ottawa: Dept of Communication: Media and the Environment: Making the Impossible Merely Difficult: The role of media in the Alberta Coal Phase Out Campaign. Nov 21. 2016
- Dr. Joe Vipond. University of Ottawa: Dept of Communication: Media and Politics: Making the Impossible Merely Difficult: The role of media in the Alberta Coal Phase Out Campaign. Nov 22. 2016
- Dr. Jason Lord. Critical Care Medicine Grand Rounds, University of Alberta, Edmonton, AB
- Dr. Jamie Fox. High sensitivity troponins and the latest evidence for rule-in and rule-out algorithms for acute MI. Moab, Utah. October, 2016
- Dr. James Huffman. STARS Airway Course - developed new curriculum and delivered at all six bases
- Dr. James Huffman. Moderated the Calgary Research Day Expert Panel on Medical Education
- Dr. James Huffman. Poster Presentation at University of Calgary's Ward of the 21st Century simulation symposium.
- Dr. James Huffman. Faculty for workshop at University of Calgary's Ward of the 21st Century simulation symposium
- Dr. James Huffman. Saskatchewan Emergency Medicine Annual Conference: Designed and led a pre-conference airway management workshop for rural emergency healthcare teams, Keynote presentation on cognition in emergency airway management, and plenary expert speaker for clinical pathological correlation competition.
- Dr. James Huffman. The Calgary Emergency Airway Management Pause (November 3, 2016). Grand Rounds
- Dr. Ian Walker. 2016 – “C-Spine Xray Workshop” – Emergency Medicine for Rural Hospitals, Banff AB
- Dr. Catherine Patocka. CORD Hack-a-thon Workshop facilitator, Council of Residency Program Directors Annual Meeting, Nashville, TN
- Dr. Colin DelCastilho. Presenting a topic on Creating a Culture of Fiscal Sustainability. Grand Rounds. November. 2016
- Dr. Colin DelCastilho. Presenting a topic on Creating a Culture of Fiscal Sustainability. SHC Leadership Forum. October. 2016

2. EM in the News

- <http://www.universityaffairs.ca/features/feature-article/medical-school-admissions-process-skewed/?c=1#comments>

3. Community Activity

- Dr. Nadim Lalani. Richard Kohn Memorial Award for Mentorship in EM: link:
<http://words.usask.ca/usaskem/congratulations-to-dr-nadim-lalani-on-the-richard-kohn-memorial-award/>
- Dr. Nadim Lalani. Coaching entrepreneurs and small business owners in Calgary
- Dr. Nadim Lalani. Representing the medical field and EM to people in the community and win some hearts and minds
- Dr. Nadim Lalani. Involving in a health start-up that is going to have a major impact on physician burnout and engagement in North America
- Dr. Jamie Fox. Volunteering for STARS outreach, and travelling to Vulcan AB with the mobile simulator to provide sim sessions for the rural docs/nurses in the ER there. March. 2016
- Dr. James Huffman. Medical School Graduation reunion committee co-chair.
- Dr. James Huffman. Regular guest on ongoing series of podcasts/vodcasts for STARS Air medical crew and Calgary EMS providers
- Dr. Catherine Patocka. American Heart Association Education Summit committee member on distributed learning

4. Leadership Role

- Dr. Scott Lucyk. The Program Director of the (still developing) Clinical Pharmacology and Toxicology program. Plans to begin having residents by July 2018.
- Dr. Ryan Deedo. Two leadership positions at STARS currently: Medical Communications Lead and Physician support for the Emergency Link Centre (ELC).
- Dr. Nadim Lalani. Coaching for the Saskatchewan Medical Association Physician support program
- Dr. Nadim Lalani. Representing the AMA physician support program and deliver wellness workshops to residency programs
- Dr. Nadim Lalani. CAEP Leadership Committee
- Dr. Jason Lord. RCPSC Critical Care Competency by Design Working Group, stage lead. Ottawa, ON
- Dr. Jason Lord. PGME, Competency Based Medical Education Committee, Assessment Lead, University of Calgary, AB
- Dr. James Huffman. Associate Director of Medical Education for STARS Air Ambulance (officially begun in Feb. 2016)

- Dr. James Huffman. Co-Chair - Emergency Airway Management Pause Working group
- Dr. James Huffman. Committee member: Calgary Difficult Airway Cart Committee
- Dr. James Huffman. Committee Member: Calgary Emergency Medicine Difficult Airway Working Group
- Dr. Ian Walker. Chair of the Pathways to Medicine Scholarship program. <http://cumming.ucalgary.ca/pathways>
- Dr. Ian Rigby. Continuing to be the Medical Director of Education for STARS air ambulance.
- Dr. Ian Rigby. Continuing to be involved with the emergency medicine departmental simulation program.
- Dr. Ian Rigby. Director on the Board of Directors for the Rick Hansen Institute.
- Dr. Ian Rigby. Member of Consumer Advisory Board for the Rick Hansen Institute.
- Dr. Ian Rigby. Cochair of the Alberta Spinal Cord Injury Strategy Partner Committee
- Dr. Catherine Patocka. Education decision editor for Canadian Journal of Emergency Medicine (CJEM)
- Dr. Colin DelCastilho. SHC Medical Director
- Dr. Colin DelCastilho. Co-Chair SHC Quality Council
- Dr. Colin DelCastilho. Co-Chair SHC Quality Assurance Committee
- Dr. Colin DelCastilho. Calgary Zone Medication Reconciliation Physician Sponsor

5. Publications

- Rosenfield, Daniel B.Arts.Sc, MD, FRCPC; Eltorki, Mohamed MBChB, FRCPC;
VandenBerg, Stephanie B.Arts.Sc, MD, CCFP(EM); Allain, Dominic MD, FRCPC;
Freedman, Stephen B. MDCM, MSc, FRCPC; Beno, Suzanne MD, FRCPC. Single-Use
Detergent Sacs: A Retrospective Multicenter Canadian Review of Emergency Department
Cases.
- **Lucyk S**, Nelson L. Consequences of unsafe prescribing of transdermal fentanyl. CMAJ.
2016;188(9):638-9.
- **Lucyk SN**, Yarema MC, Sivilotti ML, Johnson DW, Nettel-Aguirre A, Victorino C, Bailey
B, Dart RC, Heard K, Spyker DA, Rumack BH. Outcomes of Patients With Premature
Discontinuation of the 21-h Intravenous N-Acetylcysteine Protocol After Acute
Acetaminophen Overdose. J Emerg Med. 2016;50(4):629-37.

- Mithani, S., Dong, K., Wilmott, A., Podmoroff, H., **Lalani, N.**, Rosychuk, R.J., Chuang, R. and Yarema, M.C. (2016) A cohort study of unstable overdose patients treated with intravenous lipid emulsion therapy, CJEM, , pp. 1–9. doi: 10.1017/cem.2016.396. (\$1500 Grant)
- Roze des Ordon, Doig CJ, Couillard P & **Lord J.** From communication skills to skillful communication – a longitudinal integrated curriculum for critical care fellows. Under revision with Academic Medicine, Feb 2016.
- **Lord J**, Palacios Mackay M, Zuege DJ, Roze des Ordon A & Lockyer J. Impact of a one month ICU rotation on resident confidence and competence in central line insertion. Poster - accepted. OHMES Symposium, Calgary. 2017.
- Roze des Ordon A, Couillard P, Doig C, Boucher P & **Lord J.** Development and implementation of a simulation-based communication curriculum for critical care medicine fellows. Poster. ISICEM, Brussels. 2016.
- Ross M, **Walker I**, Raman M, Cooke L, McLaughlin. “Impact of Gender on MMI Performance.” *Academic Medicine*, in press 2016
- **Huffman, J. L.**, McNeil, G., Bismilla, Z., & Lai, A. (2016). Essentials of Scenario Building for Simulation- Based Education. In *Comprehensive Healthcare Simulation: Pediatrics* (1st ed., pp. 19–29). Cham: Springer International Publishing. http://doi.org/10.1007/978-3-319-24187-6_2
- Dr. Conor McKaigney. A publication coming out about what Calgary ED doctors are up to from an academic perspective - *The Development and Evaluation of an Assessment Tool for Competency in Point-of-Care Ultrasound in Emergency Medicine*.

6. Online Activities/ Blogs

- Lucyk S, Nelson LS. Fentanyl: Adding Fuel to the Fire in the North American Opioid Epidemic. Academic Life in Emergency Medicine website. Feb 29, 2016. Available from: <http://www.aliem.com/2016/fentanyl-opioid-epidemic/>

- Dr. Nadim Lalani contributed several blog posts on meded, leadership and coaching for the CANADIEM website [the biggest EM educational website in Canada]
- Dr. Nadim Lalani is on the advisory board and editorial board for the CANADIEM website
- Dr. Joe Vipond. <http://www.troymedia.com/2016/08/17/closing-coal-fix-alberta-electricity-market/>
- Dr. Joe Vipond. <http://edmontonjournal.com/opinion/columnists/joe-vipond-and-raquel-feroe-time-to-accelerate-albertas-coal-phase-out>
- Dr. Joe Vipond. <http://ipolitics.ca/2016/02/11/time-to-kick-the-coal-habit-canada/>
- Dr. Joe Vipond. <http://www.cbc.ca/news/politics/canada-coal-electricity-phase-out-1.3860131> (video)
- Dr. Joe Vipond. <http://www.ctvnews.ca/politics/mixed-reaction-among-premiers-to-phasing-out-coal-fired-electricity-1.3170768> (video)
- Dr. Joe Vipond. <http://www.cbc.ca/news/canada/calgary/calgary-doctor-coal-power-health-1.3862155> (article and audio)

7. Lectures

- Dr. Scott Lucyk provided toxicology lectures for rotating PADIS residents, the Emergency medicine “Key concepts” sessions, Internal medicine clerkship rotations, and the medical student “course 8” lectures.
- Dr. Nadim Lalani provided a series of lectures and group coaching to medical students on winning in medicine and life [gave first lecture Dec 5th]
- Dr. Nadim Lalani is a life coach for the medical students under the Student Affairs and Wellness umbrella Postgrad.
- Dr. James Huffman. Coach of STARS High Fidelity Simulation Team-2016 Air Medical Transport Conference (AMTC) Charlotte North Carolina, USA

8. Scholarly / Academic Achievements

- Dr. Ryan Deedo. Completed a Masters in Aviation Medicine from the University of Otago
- Dr. Nadim Lalani. Oral exams for residents
- created a new and innovative wellness curriculum for the residency programs that involves group and 1:1 coaching of residents and lectures at half day
- Dr. Nadim Lalani peer reviewed articles for CJEM
- Dr. Conor McKaigney. Received a grant from OHMES for \$6000 to pursue research in competency based education in emergency ultrasound. The title of the funded project is – *The Development and Evaluation of an Assessment Tool for Competency in Point-of-Care Ultrasound in Emergency Medicine*

9. Teaching & Mentorship

- Dr. Nadim Lalani. Medical Student Mentoring
- Dr. Nadim Lalani. Longitudinal preceptor for resident
- Dr. James Huffman. STARS Academy/Induction - 4 days of instruction
- Dr. Colleen Carey. 6 module comprehensive ECG interpretation course to the residents each year

10. International Achievements

- Dr. Joe Vipond. Preceptor for EM program, Patan Hospital. April, 2016
- Dr. James Huffman. International Meeting on Simulation in Healthcare (IMSH) - San Diego 2016 - Led one workshop (debriefing debriefing) and was faculty for two others

11. Awards & Nominations

- Dr. Jason Lord. Royal College of Physicians and Surgeons of Canada Program Director of the Year – **Nominee**, University of Calgary, Calgary AB
- Dr. Jason Lord. Peter Lougheed Center Medical Staff Association Clinical Teacher of the Year, Calgary, AB

12. Calgary's Lean Initiative in the News



Lean initiatives: Learning from the assembly line

LAST YEAR'S Lean initiative at St. Joseph's Health Centre (left) in Toronto is part of a trend that, for the last 10 years, has been working its way into Canadian health care.

The concept is simple: identify the processes that add value to patients and cut out all the rest. If it's done right, proponents argue that patients receive exactly what they need, only quicker, and the provider doesn't waste time or resources on superfluous steps. The concept originated with Toyota and has since spread beyond manufacturing to unrelated fields like higher education.

"A typical Lean scene includes a group of all levels of workers, from physicians and managers to administrative assistants and cleaning staff," according to a 2014 piece published at *Healthy Debate.ca*. "They write out the path patients take to get to a target, like seeing a doctor in an emergency room, and look for waste that could be

cut out of that flow. Common areas include over-production, such as making unnecessary copies of reports; wasting time, from things like long wait times for test results; or wasting movement, such as having frequently used supplies in other rooms." It's an ongoing process of regular pruning and smoothing.

Lean is not without its critics, however. Some argue that the philosophy that rules assembly lines can't be translated to health care. And while some organizations have claimed to have seen improvements, the evidence is still largely anecdotal. Here are just two examples where Lean has been put into practice in emergency care with varying results.

Alberta Beginning in 2010, four emergency rooms in Calgary developed their own "intake departments" under the new Lean methodology. Here, patients were quickly examined and either sent home, to a stretcher, to a recliner (where they received basic treatment that didn't require a stretcher), or back outside the department to await test results. Now, all physicians in all Calgary

EDs spend at least the first two hours of their shift working in this area and it has been largely successful according to Dr. Eddy Lang, the head of emergency for Alberta Health Services' Calgary zone. Only one department has fallen behind on its wait time targets and that department will soon be participating in *Kaizen*—a Lean brainstorming initiative designed to improve flow.

Saskatchewan This multi-million dollar effort was aimed not just at emergency departments but the whole province's health system. Almost 20,000 health-care workers were given a one-day overview of Lean methodology, and *Lean senseis* were flown in from Japan to guide the process. Then, early this year, a damning report by the school of public health at the University of Saskatchewan found that for every dollar saved by Lean, the province spent \$1,511. Health minister Dustin Duncan defended the program, saying the study figures were "out of date" and that Lean had actually saved \$130 million. Despite the fallout, the Saskatchewan ED Wait and Patient Flow Initiative is still targeting to reduce wait times by 60% before March 2019.