Alberta Health Services

UNIVERSITY OF CALGARY

ANNUAL REPORT

2017

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 2017. While I wish I could begin with the positives, the unprecedented degree of inpatient boarding that the Zone that was experienced again 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 2017, 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 2017 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 2017 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.

We congratulated Dr. Laurie-Ann Baker, Deputy Department Head who left us to take the position of Associate Zone Medical Director. We are pleased however to welcome Dr. Neil Collins, the ED site chief at PLC into the role of Deputy Department Head.

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.

Exciting for 2017 are intense efforts to prepare for and welcome over 1000 emergency physicians to the Canadian Association of Emergency Physician meeting hosted by our department in late May of 2018

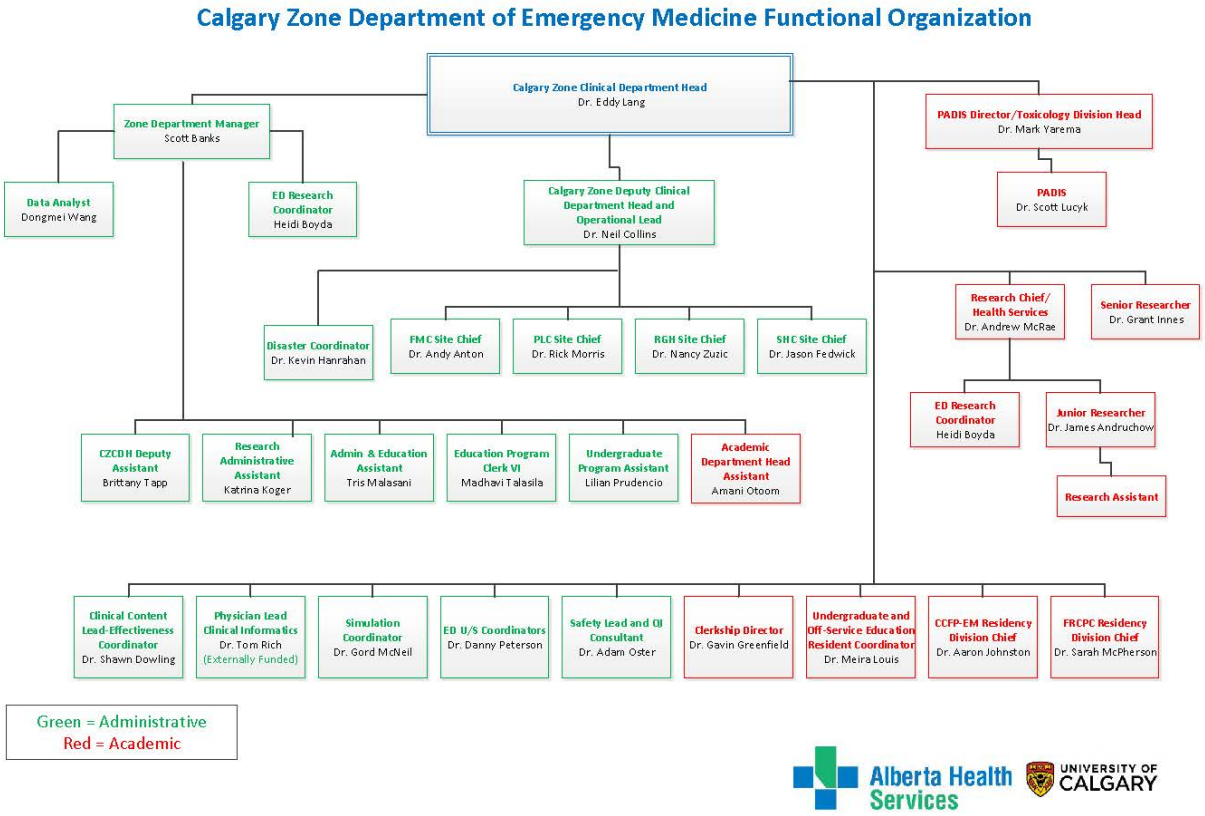
Calgary, despite the capacity pressures that are a threat to the clinical mission remains one of the most sought after places to provide high quality emergency care in Canada and beyond.

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 (Neil Collins), a Site Chief at each hospital (RGH – Nancy Zuzic; PLC – Richard Morris, SHC – Jason Fedwick, and FMC – Andy Anton, Royal College Residency Directors (Sarah McPherson & Marc Francis), CCFP-EM Residency Director (Aaron Johnston), a Clerkship Director (Gavin Greenfield), 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 (Matthew Grabove) 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, and 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 to support education, development and research 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 190 plus active physician staff and treats approximately 300,000 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

Dr. Neil Collins, MD
Deputy Department Head, Operational Lead
Calgary Zone

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

We currently have 190 MD's working in the Calgary Zone at four adult hospitals.

A Full Time Equivalent (FTE) "line" is usually between 12 and 14 shifts per 28 days.

Physicians are scheduled between 0.5 and 1.0 of an FTE.

Manpower planning involves anticipating reductions in physician supply due to parental leaves, international medical work, sabbaticals, illness, retirement, resignation and reduction in FTE requested (both for personal reasons and to accommodate non-clinical work).

Increases in operations created by the addition of shifts also requires adding new physicians. One new shift requires just over 2 new MD's to staff it.

We have currently have 11 locums working to fill short term shortages in manpower during the period July 2017 to July 2018. Some of those physicians will continue to work in the region as permanent members when their locum period expires, expanding our permanent group further.

We have also hired 10 locums starting July 2018 for 12 months.
We are in the process of hiring 8 or 9 additional locums for temporary work in the summer of 2018.
Hiring summer locums gives much needed tertiary care experience to new graduates, and allows time off for permanent ED staff. We aim for no more than 20% of the shifts being covered by locums.
Turnover and expansion of operations usually results in the hiring of between 2 and 10 new permanent Emergency Physicians per year.

Retention Strategies

AHS Calgary Zone Emergency Departments represent the largest single group of ED Physicians in Canada. We have on staff 190 physicians with 0 to 46 years of service in the region. The Calgary Zone provides highly coordinated and well organized care to a catchment area that includes over 1.2 million patients.

Calgary Zone Emergency Physicians staff the Emergency Departments of 4 Adult hospitals and some are cross appointed at the tertiary care Alberta Children's Hospital. There is a wide variety of work available. Shifting is flexible with most physicians getting time off when they request it.
Sabbaticals, parental leave and leaves for international medical work are usually accommodated.

Seniority is currently recognized with enhanced scheduling flexibility including exclusion from nights, or increased holiday time during the summer. Planning is in progress to provide further scheduling flexibility based on seniority, and to rationalize the scheduling process at Christmas and in the summer.

Job satisfaction is enhanced by a collegial atmosphere and a robust academic program. High level Grand rounds occur on a weekly basis and in-house procedural skills sessions are provided semi-annually. A robust simulation program is offered at all Calgary hospitals. Staff physicians have expert simulation sessions available to them where they can practice their resuscitation skills and crisis resource management in a non-threatening collegial atmosphere.

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 2018.

The increased number of admitted patients remaining in the ED because of a shortage of available inpatient beds in 2017 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 (Medical 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 2018.

Canadian Association of Emergency Physician Annual Meeting (CAEP) 2018

The Department of Emergency Medicine is thrilled and honored to host the 2018 Annual Meeting of the Canadian Association of Emergency Physicians (CAEP) annual meeting. Hard at work planning the event since the CAEP-sponsored planning retreat held in the spring of this year, our multidisciplinary planning committee has assembled an exceptional scientific and social program. The theme of the meeting is "Strengthening Connections" intended to highlight the importance of the alliances required to provide excellent patient care in the emergency department setting. Reflecting this our committee consists of nurses, pharmacists, paramedics and other allied health providers as well as an ED physician from a rural/regional location.

http://caepconference.ca/caep18/organizing-committee/

CAEP 2018 is expecting to receive well over 1000 Canadian emergency physicians from all over the country and beyond. The program will cater to all health disciplines involved in emergency care and we expect attendees from all walks. We are pleased to feature high-profile speakers including Brian Goldman from the CBC and Richard Bertram from WestJet speaking to the teamwork theme.

Professional Development Network

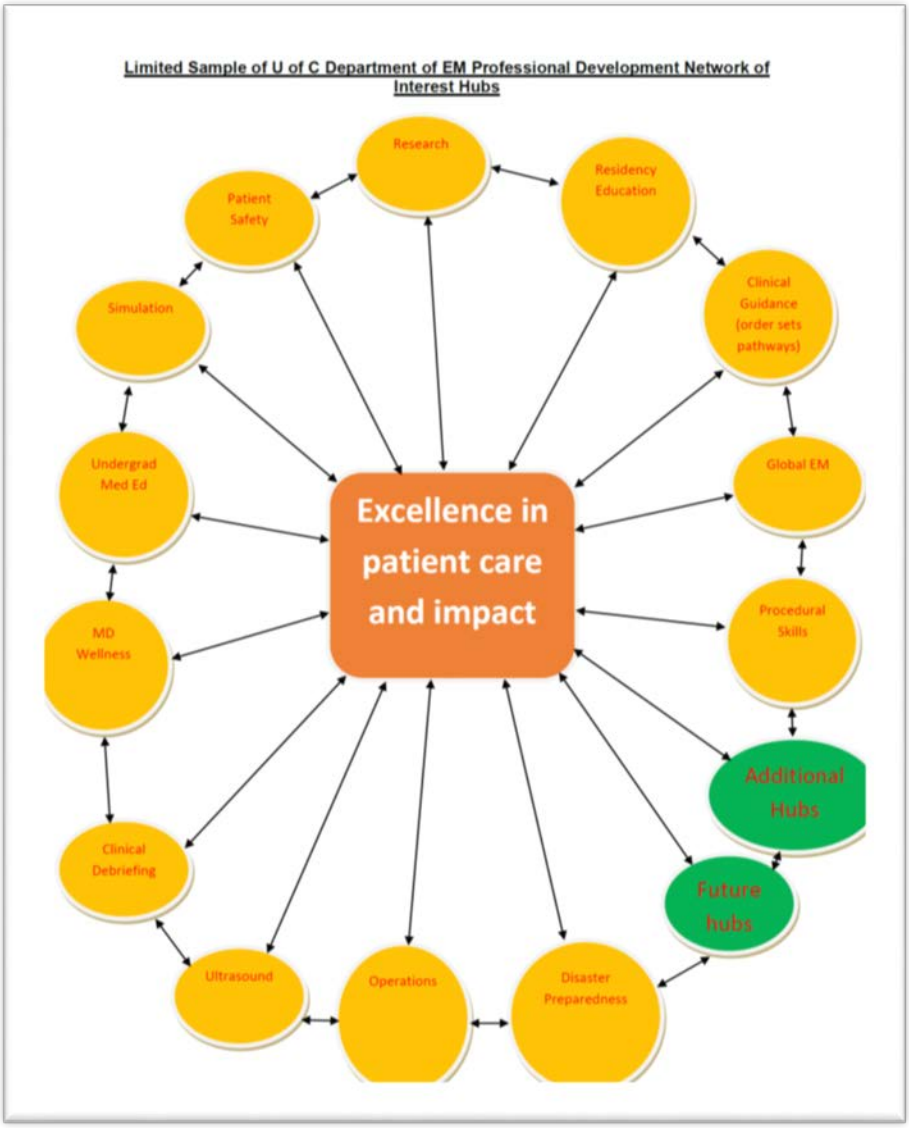
Emergency Medicine is a vast and rich specialty with numerous opportunities for physicians to develop niche expertise in areas that contribute to excellence in clinical care. These domains can be very diverse and may require varying degrees of support through training and mentorship. These areas of interest can

be an important adjunct to an emergency physician's clinical role and be a source of pride and career satisfaction. There are too many such areas to list here but can range from global emergency medicine to medical education to quality improvement and patient safety just to name a few.

As a department with nearly 200 faculty members and limited engagement outside of patient handover and educational sessions, there are few opportunities for members of this department, especially junior faculty to interact with established MDs who have extra-clinical professional expertise. Until now our department has lacked a structure that would facilitate bringing together physicians with similar interests with the goal of sharing knowledge and information about opportunities, mentorship and for planning projects.

Objective

To create a professional development network consisting of groups of physicians sharing and fostering growth in a shared area of interest i.e. hubs.



Airway Management Pause (AMP)

The Airway Management Pause (AMP) has continued to have increased uptake over the past year across all of the adult emergency departments. Interest in the project is growing outside of our group as well with requests for the tool and educational support coming from all over the province as well as internally from the ICU and Code 66 groups. The AMP and the associated tool will be presented at the Canadian Society of Respiratory Therapists conference in Vancouver this coming May and has been submitted to CAEP.

A Quality Improvement research project is currently underway at FMC supported by the research assistant program as well as a grant from the Calgary Zone Chief Medical Office. Data are also being at the other sites regarding the tool's impact and ways to improve it.

Version 10 of the tool looks to be a substantial, streamlined update on the previous iterations and the improvements have largely been based on feedback received from ED staff. It is expected to be available for use in late January 2017. The AMP working group is working closely with the ED Difficult Airway Management committee and the Calgary Zone Difficult Airway Cart committee to ensure a consistent message and supported approaches across the zone.

2017 Calgary Emergency Department Disaster Report

- First, in a long time, City Wide Disaster Exercise involving CPS, EMS, CFD, E/DM and all of the City's Emergency Departments on June 26, 2017. Simulated active assailants and multiple casualties at University of Calgary. Many issues were dealt with very well but we also learned about many issues where our plans may fall short in a real disaster. This exercise has spurred an increased interest and investment of time and resources at many sites. There is a renewed energy in working groups amongst all of the EDs and hospitals, largely because of this exercise and the seemingly increased frequency of these events around the world.

- New ED MD/RN Disaster Planning group for all sites meeting quarterly to discuss the plans and approaches to Code Orange (external disaster) event management in the City.

- Regular meetings with EMS/RAAPID in order to better manage the notification and activation of Code Orange between agencies. This has been, and continues to be, a challenge as many events which would have been classified as disasters, in retrospect, went without activation and all of the resources that this brings.

- Work is being done with the Office of Medical Affairs to help integrate the other hospital medical services into the Code Orange plan.

- Physician fan out has been a challenge with existing plans and therefore a solution that is both desktop and cell phone based with MD texting are being developed with potential role-out in early to mid 2018.

- Dr's Hanrahan, Lendrum, Granberg and Bateman continue to be involved with the Provincial Disaster Team, Canada Task Force 2 (CANTF2), with various exercises and preparedness initiatives including the Provincial Disaster Exercise "EMX17".

- Planning is under way for a "Disaster Day" for our Emergency Residents in June 2018 involving EMS and CANTF2 and many faculty.

- The University of Calgary's annual "Bermuda Shorts Day" was provided a field hospital for the first time. EMS staffing was assisted by one Calgary Emergency Staff Physician and two Senior Residents. This initiative dramatically reduced the number of patients transferred to Calgary EDs and will likely be a repeat model going forward. A similar facility has been in existence with the Calgary Stampede Parade, significantly assisting EMS and decreasing ED presentations.
- Planning is underway with E/DM, EMS and Alberta Public Health in order to better prepare and staff for Mass Gathering events (concerts, sporting, etc) to help to reduce the number of patients presenting to Calgary EDs.

- Two papers were delivered at the April 2017 World Association of Disaster and Emergency Medicine conference in Toronto, co-authored by Calgary ED faculty.

- Physician staff N95 testing is near 100% and some members have taken the opportunity to do CBRNE training with our nursing colleagues. E/DM has helped to make this a regular occurrence.

- Disaster fellowship graduated its first participant, Dr Brad Granberg and has another fellow this year. This program has attracted multiple new applications for the 2017/2018-year.

- Working group formed with ICU/Trauma to develop plans to deal with "sub-code orange" disasters at FMC.

Opioids/Harm Reduction

Heather Hair, RN MBA
Executive Director
Emergency Strategic Clinical Network (ESCN)

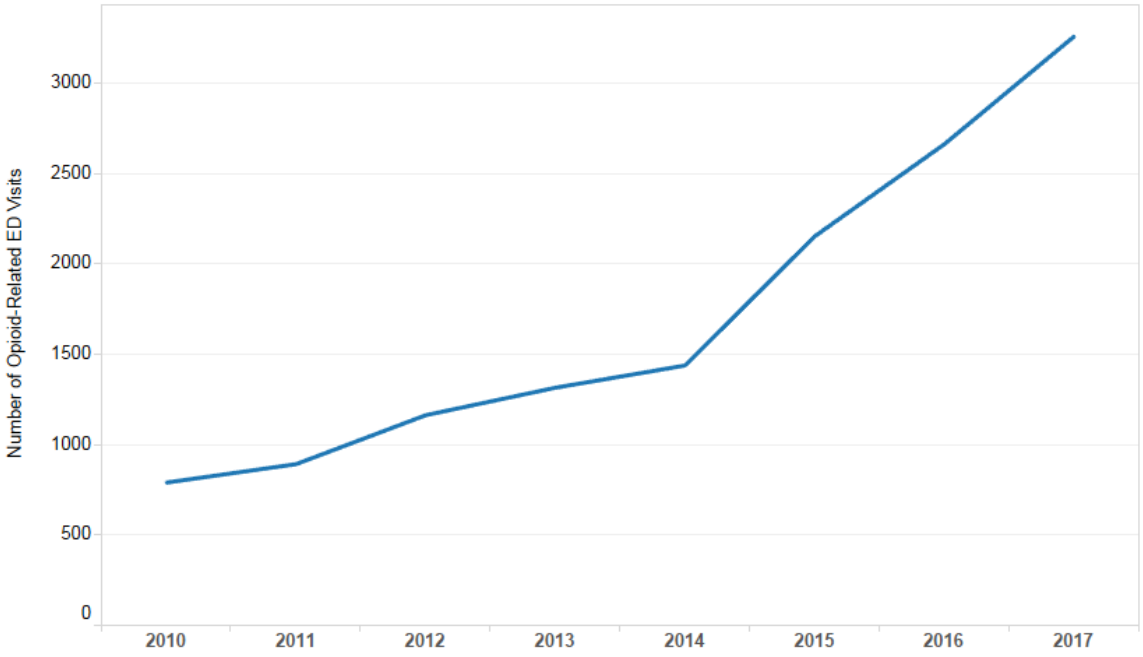
The emergency departments in the Calgary zone in 2017 continues to experience a significant rise in presentations of Opioid-related visits vs previous years. The number of visits includes all emergency departments and urgent care centres in the Calgary zone.

Several partnerships are underway addressing strategies to tackle this crisis including:

- education to the public while in the emergency department
- take home naloxone kit availability
- monthly reporting of activities
- continued partnership to community services

While the annual numbers continue to rise for Calgary there have actually been decreases in recent months which are masked in the annual figure. According to Dr. Nick Etches, Medical Officer of Health for the Calgary Zone, there are many factors that influence the number of opioid overdose presentations to EDs, including but not limited to; changes in the illicit drug supply, payment dates for social services, communication campaigns, seasonality, changes in opioid prescribing rates, access to opioid agonist treatment, and the availability of naloxone kits and supervised consumption services. Finally, awareness and education campaign of the safe consumption sites and the take home naloxone kits would be contributing to the decrease in Calgary zone in recent months.

Data Source
Data was extracted for the National Ambulatory Care Reporting System (NACRS) Data is reported for ED/UCC visits include data up to November 30th, 2017.



Identifying Opioid-Related Visits

Opioid-related visits were identified by counting the number of visits with an opioid-related diagnosis code in any of the 10 diagnosis code fields (DXCODE1-DXCODE10). Opioid-related ICD10 codes include:

- Mental and Behavior Disorders due to use of Opioids (F11*)
- Poisoning due to Opioids (T40.0, T40.1, T40.2, T40.3, T40.4, and T40.6)

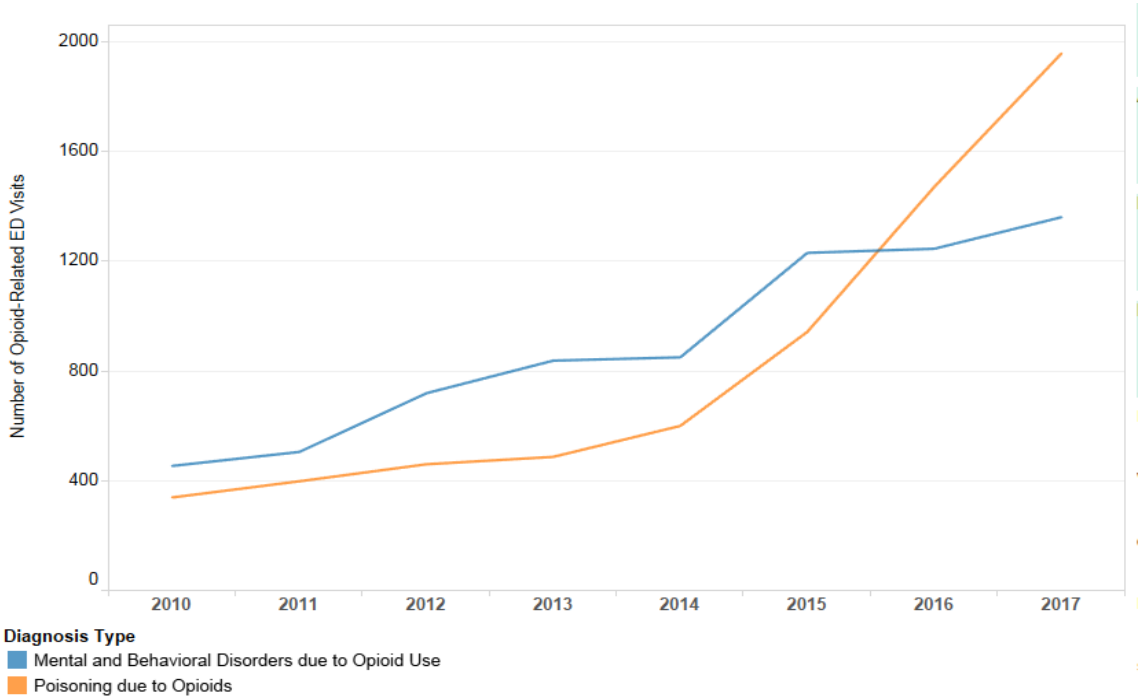
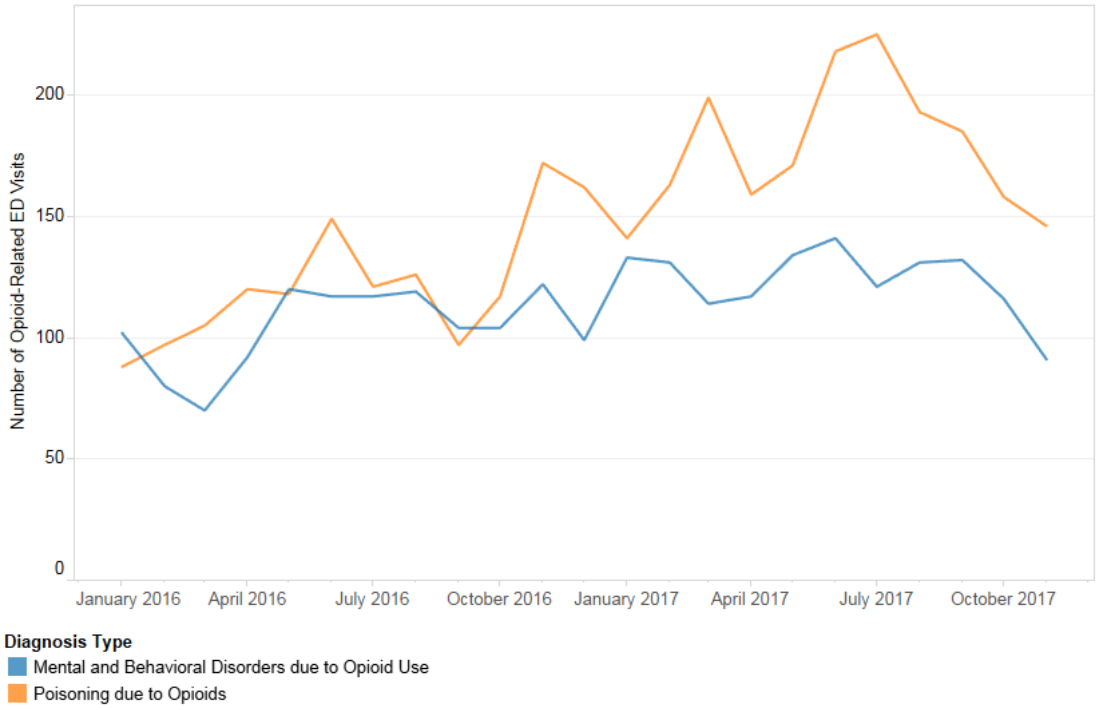


Figure 4. Monthly Number of Opioid-Related ED/UCC Visits to Calgary Facilities by Diagnosis Type, 2016-2017YTD


Number of Opioid-Related ED Visits
200
150
100
50
0
January 2016
April 2016
July 2016
October 2016
January 2017
April 2017
July 2017
October 2017
Diagnosis Type
Mental and Behavioral Disorders due to Opioid Use
Poisoning due to Opioids

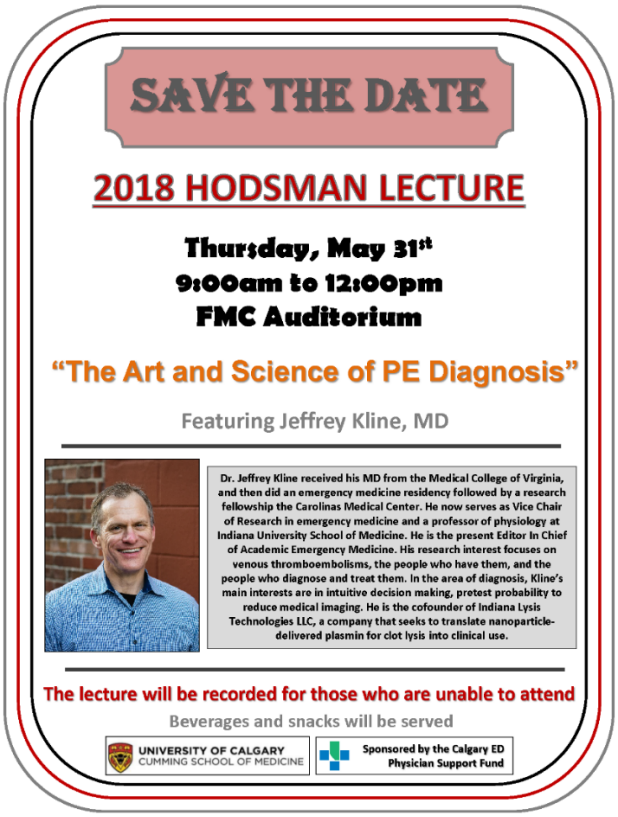
Mike Hodsman Memorial Lecture

The Mike Hodsman Memorial lecture celebrates the life of our late colleague, Dr Mike Hodsman and his great love of learning. The third annual lecture took place April 20th, 2017 in the Foothills Auditorium. The event was well attended by emergency students and residents, nurses, and physician staff from several departments. Dr Ian Walker introduced the morning with a case of medical error. Our featured speaker was Dr Pat Croskerry from Dalhousie University. He spoke on medical error and the cognitive processes underlying different subtypes of medical error. Local speakers Dr Adam Oster and Dr Ward Flemons complemented our featured speaker by adding presentations on patient safety.

Dr Croskerry joined us the preceding evening for a dinner and social event where he outlined his career trajectory.

This event was funded through the Physician Support Fund, remaining funds from Mike Hodsman memorial fundraising, and the resident and clerk electives account.

There was widespread positive feedback from the event. We look forward to the 2018 lecture featuring Dr Jeff Kline.



Multidisciplinary Analgesia Working Group

The Calgary Zone Emergency Department Multidisciplinary Working Group continued to meet actively in 2017. 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

EMS Fellowship

I have had a fantastic year working with the EMS and Disaster services in Alberta Health. My year started with the Mass Casualty Simulation at the University of Calgary which gave me a close look at the current EMS and Disaster structures and we have worked at both a local and provincial level to identify problems and improve current protocols. The EMS system has provided me with a unique opportunity to work with the Tactical EMS department, develop new administrative skills such as protocol writing and attend many local and provincial quality assurance meetings.

In addition my core fellowship curriculum, I have been working with the CAEP 2018 organising committee on what will be a very inclusive conference, with specific roles for EMS tracks, pre conference courses (HAZMAT and WiSE) and networking events. One of the highlights has been working with the simulation departments in gaining formal simulation training and holding events for students, residents and table top disaster training.

My preceptors have been extremely supportive in letting me work clinical shifts to maintain skills and I hope to continue my link with the Calgary Emergency team in the future. I would like to extend my thanks not only to these preceptors, but to everyone in the Calgary Emergency system who has made me feel very welcome.

- Dr. Gary Mitchell, MB BaO BCh FACEM (Australia)

Social Media Update

The past year has seen the continued development of the UCalgary EM website (cumming.ucalgary.ca/ermedicine), and @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), 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. Also be sure to check out the Academic Life in Emergency Medicine (ALiEM) blog where Fareen Zaver and Catherine Patocka are amazing leaders and do some fantastic work.

Finally, CAEP will be in Calgary May 26-29, 2018. Make sure you follow the @CAEPConference Twitter account, check out the caepconference.ca website, and most of all, join us at the conference in May.

- Chris Bond

Social Media Publications 2017

SGEM Hot Off the Press: Management of bronchiolitis in community hospitals.
Wang JJ, Mohindra R, Milne K, Crocco A, Bond C.
CJEM. 2017 Nov;19(6):475-479. Epub 2017 Sep 14.
PMID: 28905693

SGEM Hot Off the Press: Delayed complications of sternal fractures.
Lee H, Mohindra R, Milne K, Bond C.
CJEM. 2017 Sep;19(5):392-397. Epub 2017 Aug 24.
PMID: 28835300

The impact of social media promotion with infographics and podcasts on research dissemination and readership.
Thoma B, Murray H, Huang SYM, Milne WK, Martin LJ, Bond C, Mohindra R, Chin A, Yeh CH, Sanderson WB, Chan TM.
CJEM. 2017 Sep 13:1-7. [Epub ahead of print]
PMID: 28899440

JGME-ALiEM Hot Topics in Medical Education: Analysis of a Multimodal Online Discussion About Team-Based Learning.
Riddell J, Patocka C, Lin M, Sherbino J.
J Grad Med Educ. 2017 Feb;9(1):102-108. doi: 10.4300/JGME-D-16-00067.1.
PMID: 28261403

ALiEM Blog and Podcast Watch: Toxicology.
Zaver F, Craddick M, Sanford A, Sefa N, Hughes G, Lin M.
West J Emerg Med. 2017 Oct;18(6):1114-1119. Epub 2017 Sep 11.
PMID: 29085545

Shock Trauma Air Rescue Society (STARS) Update

The Alberta Shock Trauma Air Rescue Society (STARS) provides critical care level rotary wing transport for trauma patients throughout Alberta as well as both north and south eastern BC. Two pilots, a paramedic and a nurse are ready 24 hours a day, seven days a week at three bases in Alberta to provide care and transport to critically ill and injured patients. A Transport Physician accompanies patients on the helicopter on about 10% of our missions and is available and provides immediate 24 hour a day online medical supervision and control throughout all missions. Our Transport Physicians are also expected to accompany AHS fixed wing and ground ambulance crews for critical care transports as patient care needs, weather, and other logistical variables require. STARS is fully Accredited through the Commission on Accreditation of Medical Transport Systems (CAMTS).

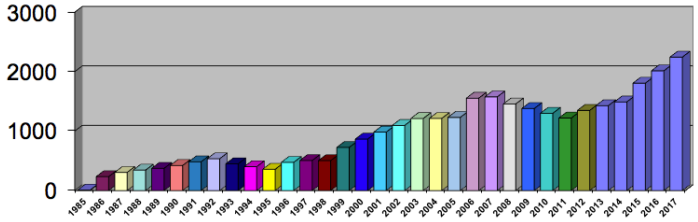
The STARS Emergency Link Centre (ELC) is an advanced 24-hour communications centre providing one-call access to a variety of resources. Around the province, the ELC plays several important roles. These roles range from receiving the first call for help from an organization or an individual, to being called by a partner in the "Chain of Survival" for assistance with an emergency. In all cases, the ELC's primary job is to connect all of the emergency and medical services into a single conversation to determine the most effective medical response for the patient and the particular situation. This includes the immediate co-ordination of medical advice and transportation as required (regardless of whether rotary resources are used for any particular mission). The STARS ELC works closely with RAAPID North and South in providing physicians from rural communities with quick access to patient referral and specialist advice. We also work closely with our industry partners with a site registration and work alone program that helps keep track of workers, medical providers and capabilities at remote industrial work sites around the province.

This report will primarily focus now on southern Alberta activities.

We have an excellent working and logistical arrangement with RAAPID South. RAAPID South does an outstanding job and helps to make sure patients and consultants are linked together in a fashion that maximizes utilization of available operating room, bed, and critical care resources. This information is immediately available to assist STARS' Transport Physicians in making sure patients are transported to the facility best able to look after them. This system is extremely effective continues assists with Emergency bed capacity issues as many of our patients are transported for direct admission to ICU, CCU, PICU, and occasionally direct to the OR.

In total for 2017, the ELC and our Transport Physicians were involved in triaging 1119 interfacility Red Patient referrals in addition to 50 Industry Emergency Calls, and 1372 scene call requests. We had a total of 591 rotary missions in 2017, leading ultimately to the transport of 493 patients, including 3 missions where 2 patients were transported at the same time. These missions culminated in 891.8 total flight hours on our rotary machines. Our overall volume of calls continues to slowly rise over time as per the following graph:

Calgary Calls: 1985 to present



Of these missions, the breakdown of mission type as well as patient and destination detail is as follows:

Calgary base 2017 Rotary Wing	TOTAL	%
Patient Breakdown	3	
Greater than 2 pt mission (>2 pcrs generated)	0	
All Two patient missions (2 patient care records generated)	3	0.6
True Two patient missions (2 patients flown simultaneously)	0	0.0
Scene / Interfacility		
Scene patient missions (total)	149	30.4
IFT patient missions (total)	341	69.6
Search & Rescue patient missions (total)	0	0.0
(pcr generated / 2 pt trips only counted once)	490	
Adult trauma	197	40.0
Adult medical	225	45.6
Ped trauma	32	6.5
Ped medical	38	7.7
NICU	0	0.0
High risk OBS	1	0.2
Organ donation	0	0.0
Total # of patients	493	
Mission Frequency (aircraft lifted off)	**Total**	**%**
1 Sunday	84	14.2
2 Monday	81	13.7
3 Tuesday	83	14.0
4 Wednesday	65	11.0
5 Thursday	73	12.4
6 Friday	96	16.2
7 Saturday	109	18.4
Day missions (9am-7pm)	374	63.3
Night missions (7pm-9am)	217	36.7
		100.0
Total # of Missions (aircraft lifted off)	590	
Mission went by ground or fixed wing (all legs)	1	
Total # of Calls (aircraft did not lift off)	1653	
(info received from Viper Cad)		
Total # of Calls + Missions	2244	

Calls + Missions Daily Average	**6.14**

Scene call breakdown	Total	%
Adult trauma	103	68.2
Adult medical	32	21.2
Ped trauma	15	9.9
Ped medical	1	0.7
High risk OBS	0	0.0
	149	
Unknown if VFR or IFR	591	100.0
(aircraft lifted off)	591	
Total hours flown	891.8	
Total nautical miles	73687	

	Calgary base		
	Pt age breakdown	**Total**	**%**
	under 1 year	9	1.8
	1-10 years	40	8.1
	11-20 years	42	8.5
	21-30 years	56	11.4
	31-40 years	40	8.1
	41-50 years	64	13.0
	51-60 years	72	14.6
	61-70 years	92	18.7
	71-80 years	53	10.8
	81-90 years	25	5.1
	91+ years	0	0.0
	unknown age	0	0.0
	Total # of patients	493	100.0
	Patients Daily Average	1.35	
	MALE	329	66.7
	FEMALE	164	33.3
	unknown sex	0	0.0
		493	
	alberta childrens hospital	62	12.6
	south health campus	20	4.1
	foothills hospital	348	70.6
	patient died or was not transported	13	2.6
	peter lougheed hospital	28	5.7
	rockyview hospital	14	2.8
	red deer / innisfail / golden / blairmore hospitals	4	0.8
	strathmore / lethbridge hospitals	2	0.4
	edmonton u of a, misericordia hospitals	1	0.2
	olds / invermere / three hills / drumheller hospitals	1	0.2
		493	
	Flt doctor on flight	53	10.8
	AMC only on flight	404	82.4
	Specialty teams on flight	33	6.7
3	490	490	
341	Flt doctor on interfacility flights	40	11.7
149	Flt doctor on scene flights	13	8.7

PED PTs 28 days-16 yrs	TOTAL	%
Cardiac	2	0.41
Pulmonary	19	3.85
Non-trauma neuro	9	1.83
Non-trauma surgical	3	0.61
Other medical	5	1.01
Trauma	30	6.09
Burns	2	0.41
OBS	0	0.00
Other	0	0.00
	70	14.20

ABORTED (inflight) TRANSPORTS	Number	Percent
Weather	5	5.0
Maintenance / Mechanical	2	2.0
Medical denial (aircraft diverted to another mission)	2	2.0
Patient condition changed (stable, died, medically not required)	24	23.8
Alternate transport - fw, grd, other helo, dropped off nicu / picu team)	63	62.4
Other (Search and Rescue)	5	5.0
TOTAL Aborted Transports	101	100.0

The STARS Quality Management Program (medical component) includes a rigorous minimum 2 party (not involved in the mission) review of 100% of our patient care records for appropriateness of patient care and documentation including secondary screens of any patient transport which involves airway management, blood administration, high risk obstetrics, pediatric patients, patients who arrest while in the care of STARS, or does not meet the utilization review criteria. All transports are monitored for adherence to response time and care guideline thresholds. Any event which meets our criteria for moderate to high-risk events, undergoes a Sentinel Event Review.

STARS transports trauma patients based on standards and utilization guidelines arrived upon by local consensus and research. All major trauma patients are taken to the Foothills Hospital Medical Centre or the Alberta Children's Hospital depending on the age of the patient. One primary response aircraft is based in Calgary, though the Edmonton machine will occasional come down to Calgary for large MCI incidents or in situations wherein the Calgary machine is already tasked.

STARS Calgary has a very active outreach and education program and the STARS Human Patient Simulator (HPS) Program is the first mobile program of its kind in North America. The HPS is a dynamic, interactive, computerized mannequin. It is used for very specific, guided, intensive contact and analysis of Advanced Medical Care (AMC) critical thinking skills. The HPS mannequin simulates complex medical and traumatic problems over and over again, offering medical personnel an opportunity to test and practice their reactions and skills leading to a high degree of familiarity and confidence. In addition, patient care scenarios in our aircraft mock-up enhance the experience and better prepare our AMC for actual air medical transport events. Our mobile program also allows us to deliver advanced medical care training to rural health providers that use our services. It is an excellent means of ensuring our teams work towards the common goal of superb patient care. In the 2017 calendar year, our HPS program visited 27 communities and engaged with teaching sessions involving 510 learners. It is now fairly routine for us to hear about how some of the critical care teaching principles reviewed in our HPS outreach sessions are applied to subsequent patients managed in these same communities.

We have extremely high quality training programs for our Air Medical Crew with tremendous involvement from many of our Transport Physicians. This includes an outstanding Airway Management Course as well as an in depth Ventilation Management Course. We are indeed fortunate to have the likes of Dr Ian Rigby, Dr Rob Hall, Dr Paul Tourigny, Dr Arthur Tse, Dr Gavin Greenfield and many others who have worked on

developing curriculum that stands up to or surpasses the best courses out there. Our crew are also fortunate to have regular exposure to direct airway management in the regional ORs with our Transport Physician Anesthesia colleagues, Dr Saul Pytka and Dr Jamin Mulvey. Both are highly rated and skilled educators.

STARS Calgary is additionally very active in residency education and for the last 2 years has embarked on a Transport Physician fellowship program in partnership with Auckland HEMS in New Zealand. We are currently taking on average 10 residents per year in the their R4 & R5 years from Emergency Medicine, Anesthesia, and ICU, for a 1 month rotation wherein they manage all flight and ground critical care transport cases in conjunction with the regular on call Transport Physician. Additionally, our Transport Fellows are spending 6 months with us and 6 months with Auckland HEMS, learning in far more detail all of the aspects critical to patient care in the air transport environment as well as the administrative infrastructure behind these programs. Dr Paul Tourigny and Dr Andrew Fagan locally (our 1st ever Flight Fellow a few years ago) have been instrumental in setting up and managing this program. These trainees are our future and ensure that any new Transport Physician we hire is more than ready to fly.

Overall, I am extremely proud of the work our Communications Staff, Air Medical Crew, and Transport Physicians do every day to support the critical needs of the ill and injured in southern Alberta. Our support staff likewise from fundraising to engineering make it all possible as do the citizens and Government of Alberta who support us. We have a tremendous and dedicated team and are fortunate to work with our partners within the Calgary zone and in government who all have the seamless delivery of healthcare no matter where the patient originates, as a driving force. I've lectured on prehospital care issues across this country and can confidently say after innumerable discussions about systems issues elsewhere, that no system works better than it does here in that regard.

Here's to our continued successes together,

Michael J. Betzner MD FRCPC
Emergency Physician CHR
Clinical Lecturer U of C
Flight Physician STARS
Medical Director STARS Calgary

Pharmacy Update

Pharmacy officially received funding for 1 full time pharmacist position in ER last summer. We are now into our 2nd year of providing pharmacy services in ER. We are a 3 person team that rotates through the dispensary, ICU & ED. We provide services Monday- Friday during the day & review all the abnormal microbiology labs when present. The pharmacists in the ER have prescribing authorization & can provide the prescriptions for the abnormal lab patients when required, clarify prescriptions for community pharmacies & complete special authorization forms so patients can receive their medications under their insurance plans. We also provide counselling to patients in the ED, screen septic patients, provide recommendations to physicians, answer drug information questions and will soon be involved in the Hospital at Home program. We are part of the analgesic committee & have played a role in helping to change order sets that improve patient safety. We helped to roll out the Take Home Naloxone kit program & participate in patient teaching for this as well. When required, we also help provide seamless care for patients being discharged from ED (eg. Facilitate prescriptions being sent to pharmacies,

arranging for outpatient Methadone or Suboxone, arrange for changes to blisterpack medications etc.). We also play a role in education of staff like participation in physician ED case rounds & nursing inservices.

We also now have a clinical technician that assists in completing best possible medication histories. They are present during the day from 7am-3pm, Monday- Friday.

In 2018, the faces of the pharmacy group will change but will continue to be a rotating 3 person team continuing all of its services to the department.

OT/PT Update

Occupational therapy (OT) and physical therapy (PT) coverage for the Emergency Departments of the Calgary Zone differs between adult sites. This is because the funding for these positions is provided by the Allied Health departments at each site, so clinical leadership and management in each location have developed their own programs, depending on staffing levels.

At Rockyview, an occupational therapist is dedicated to the ED with coverage Monday to Friday, 08:00 to 16:15. The OT prioritizes patients who have the potential to be discharged from the ED pending functional assessments, but sees in-patients in ED when caseload allows. There is physiotherapy on a consult basis only, and physio referrals are prioritized by the OT.

At all of the other hospitals, the OTs and PTs covering ED are also responsible for covering other in-patient units, therefore see ED patients by consultation only.

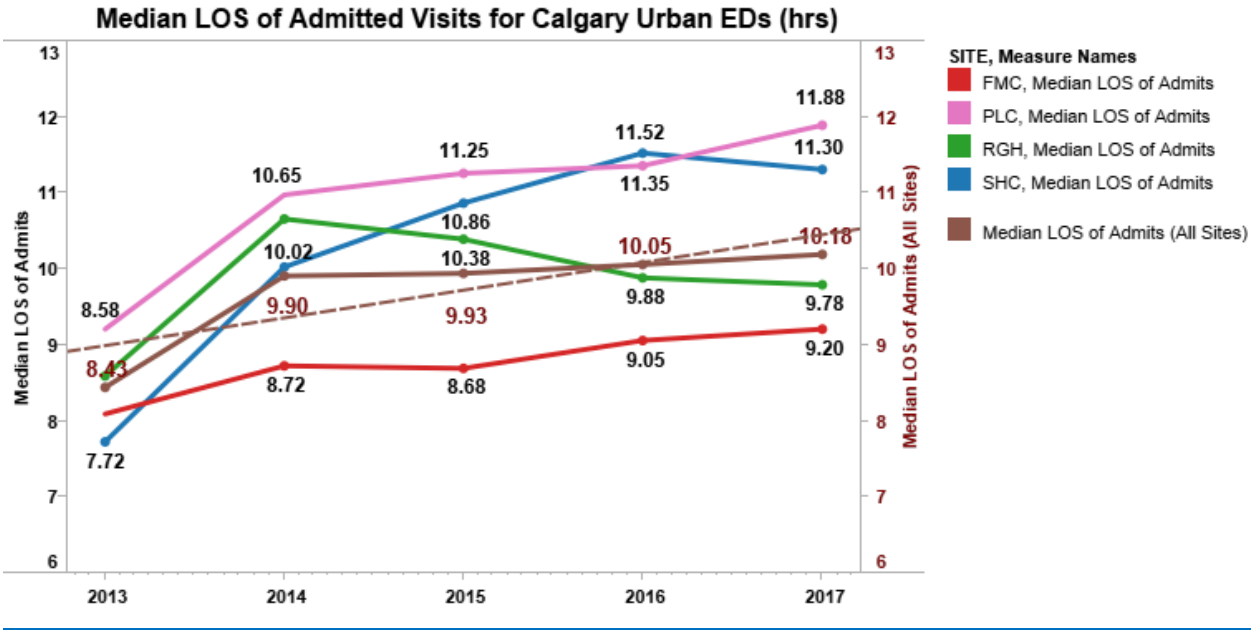
At South Health Campus, either an OT or a PT covers the ED caseload Monday to Friday. A recent program evaluation indicates they are spending roughly a 0.3 FTE in the ED.

The Foothills OT in ED program focuses on assisting to determine patient discharge disposition, while the PT most often sees patients who need chest physio or to assist the OT with neuro assessments.

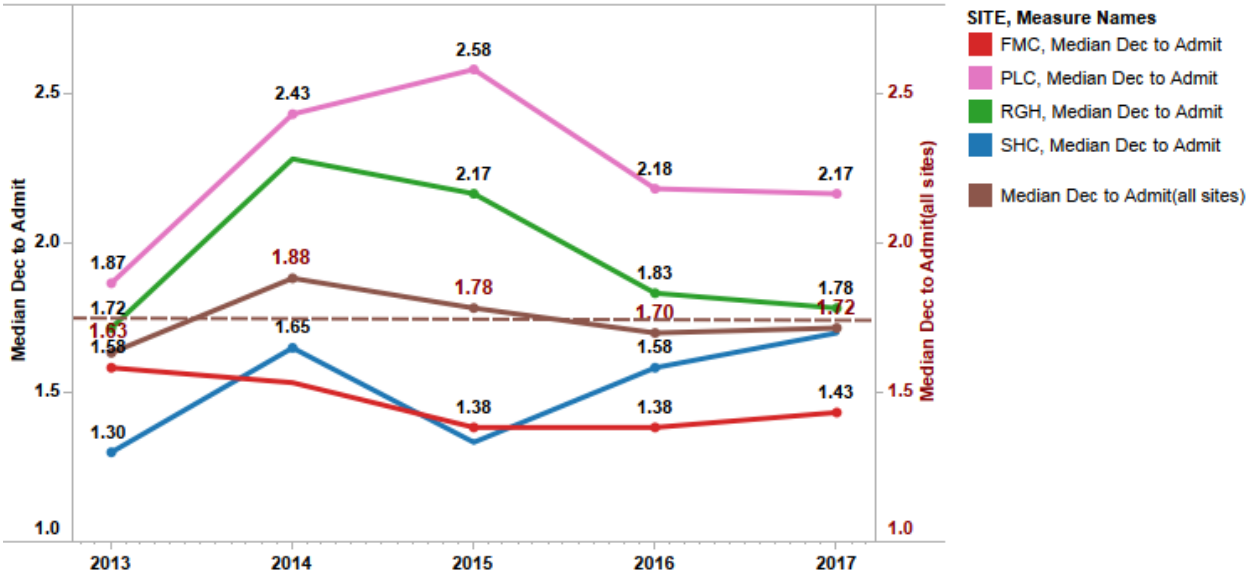
PLC offers an OT consult service in the Emergency Department Monday to Friday during regular hours. Referrals can be from any health care provider for patients who require a functional assessment to facilitate a safe discharge plan home directly from the ED.

Comparative Annual Data

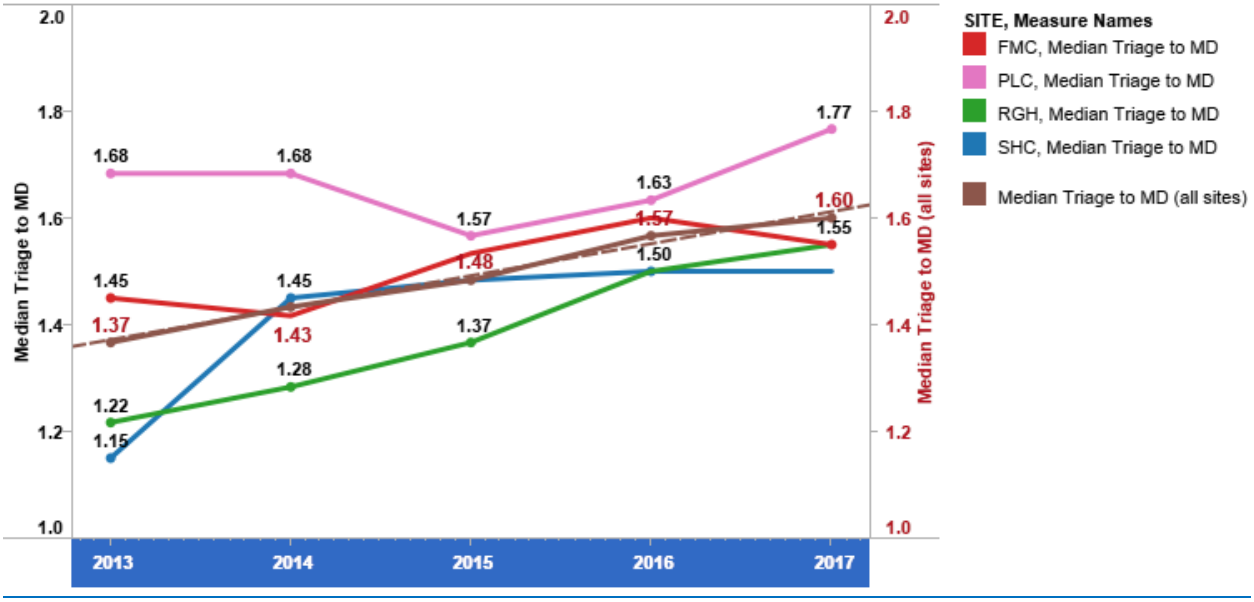
Dongmei Wang
Data Analyst



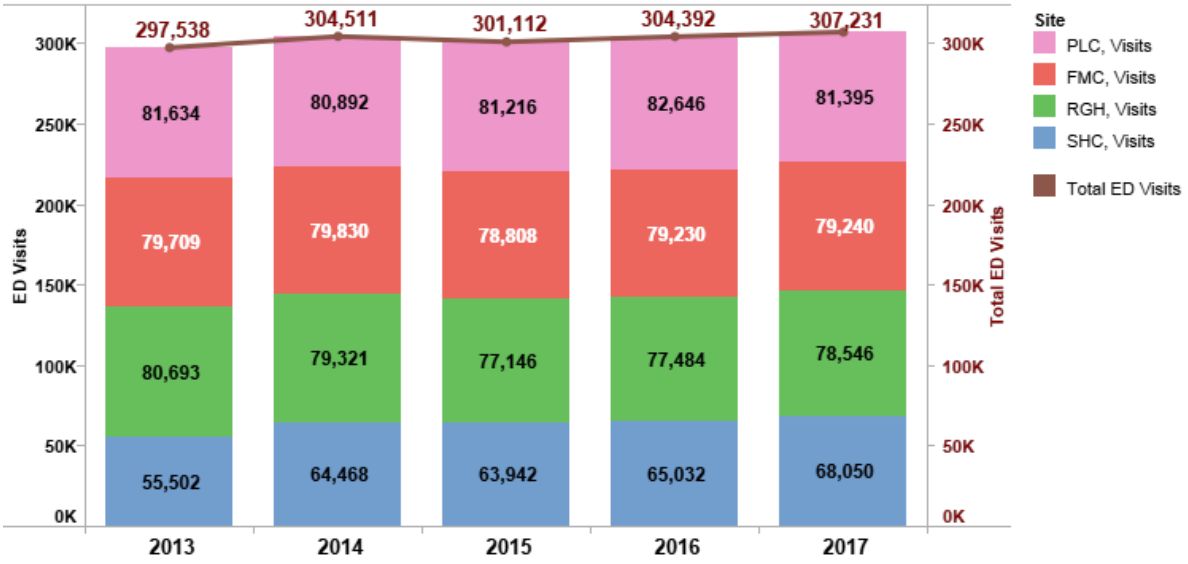
Median Decsion to Admit Time Calgary Urban EDs (hrs)



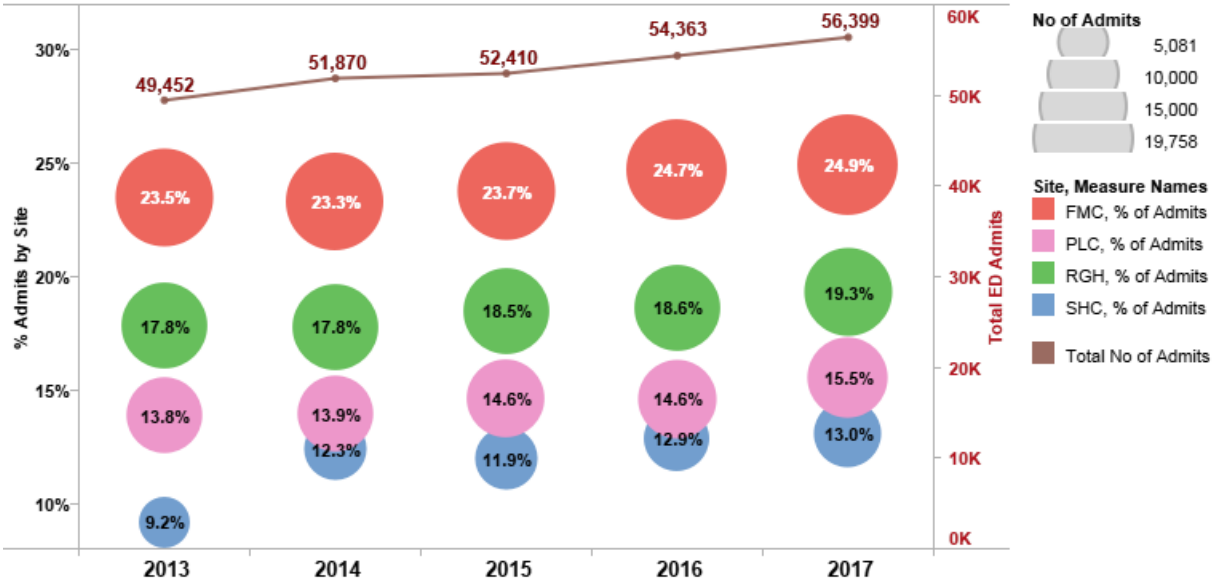
Median Triage to MD of CTAS2&3 ED Visits Calgary Urban EDs (hrs)



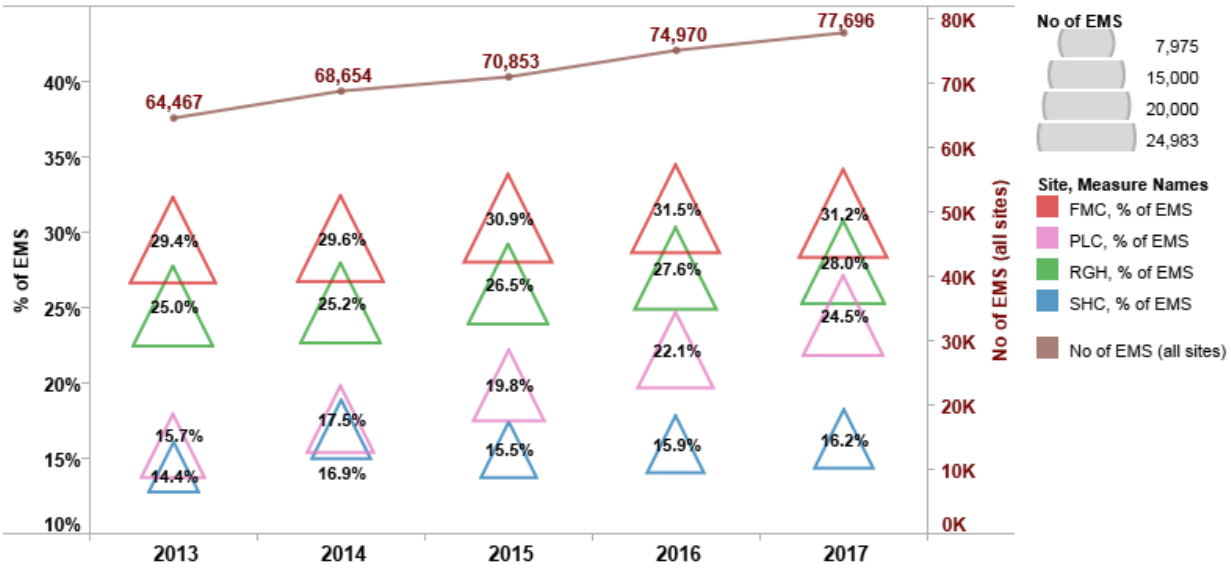
Annual Visits to Calgary Urban Adult EDs



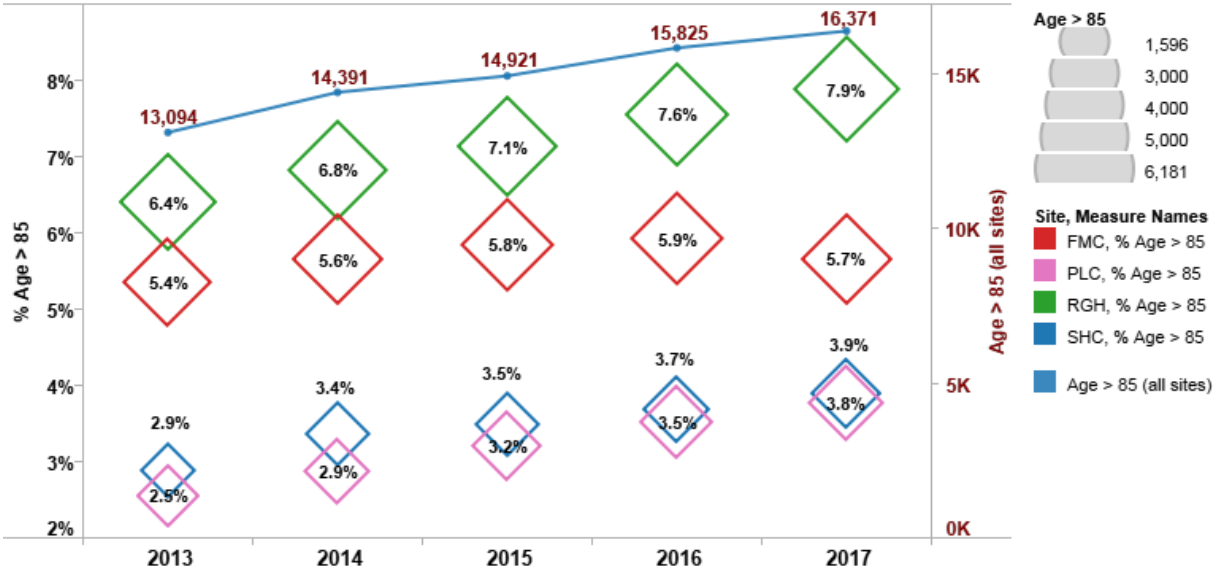
% of Admits and Total Admitted ED Visits in Calgary Urban EDs

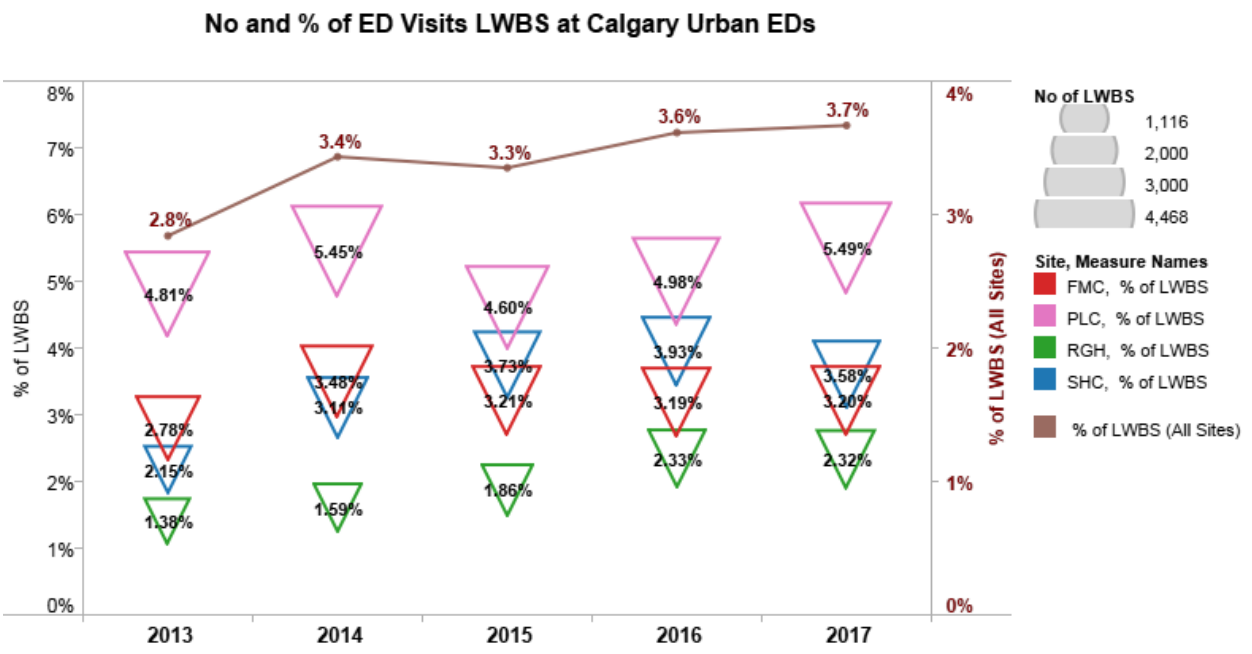


No and % of ED Visits Arrived by EMS Calgary Urban EDs



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




No and % of ED Visits LWBS at Calgary Urban EDs
% of LWBS
% of LWBS (All Sites)
8%
7%
6%
5%
4%
3%
2%
1%
0%
4%
3%
2%
1%
0%
2013
2014
2015
2016
2017
2.8%
3.4%
3.3%
3.6%
3.7%
4.81%
5.45%
4.60%
4.98%
5.49%
2.78%
3.48%
3.21%
3.19%
3.20%
2.15%
3.11%
3.73%
3.93%
3.58%
1.38%
1.59%
1.86%
2.33%
2.32%
No of LWBS
1,116
2,000
3,000
4,468
Site, Measure Names
FMC, % of LWBS
PLC, % of LWBS
RGH, % of LWBS
SHC, % of LWBS
% of LWBS (All Sites)

Site Updates and Accomplishments

Rockyview General Hospital

Dr. Nancy Zuzic, MD
RGH Site Chief

Capacity

RGH ED saw a slight increase in volume for 2017, seeing 78,408 patients (up 1% from 2016). With this increase in visits, we saw an increase in length of stay from 13.3 hours to 13.8 hours.

Staffing

Our Emergency Inpatients (EIPs) remained consistently high throughout the year in 2017, whereas we have experienced a seasonal reprieve in previous years. We continue to be responsive to patient volumes by mindfully opening and closing a flex patient care area in the ED. High EIPs are the main challenge to the responsive closing of this flex area. Despite the challenge, since April 2017 RGH ED has saved 2870 worked hours, in large part due to the flex strategy.

Several years ago RGH ED moved from a manual phone call based staff callout approach to an iPhone text based approach. This was highly impactful in reducing the time involved to contact staff as well fill short notice staffing needs. The value of this text based approach was further proven in the success of RGH ED's staff call out and response during the Calgary Zone Mock Code Orange exercise in June. Since that time we have continued to innovate and have moved to an email to text based system. This transition has further streamlined the efficiency and effectiveness of communication of staffing needs
Physician Manpower remains stable with 56 physicians scheduled at the site. Shifts are 6 to 7 hours in length with 17 shifts scheduled on Mondays and 16 shifts scheduled daily the remainder of the week. 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 in this challenging time.

Intake

RGH ED intake area continues to be highly efficient and is held in high regard throughout the province. The demand on Intake increases to match its capacity. In 2017, 38% of patients were triaged directly to intake (from 36% in 2016). The key RN role in Intake is Intake 1, who is the first contact for patients once triaged, and responsible for the flow in the area. Following staff recommendations, an orientation for this role was developed to help newly triage trained staff feel more confident when taking on these responsibilities. The ability to assess and treat patients efficiently is impacted when high volume of EIPs decrease access to assessment and treatment spaces.

Pharmacy
The need for a dedicated pharmacy technician in the ED became apparent after the temporary funding for the position expired in 2016 and rates of BPMH completion dropped. After their return, a recent chart audit showed BPMH completion rates had climbed to 83% for admitted patients.

SharePoint
The creation of the ED SharePoint website has been instrumental in facilitating communication and creating efficiency in the ED. Highly accessed by the unit clerks in particular, the site has allowed immediate, and searchable access to the hundreds of printable documents, resource guides, and processes needed for daily function. This has drastically decreased the work load of maintaining stock of each form, and ensured up to date copies are used. SharePoint is also a valuable resource for staff to review department specific process changes and updates.

Teletracking
Through collaboration with distribution services, we have implemented the use of a web-based porter paging system for patient transport to inpatient units. The system has been well received. While we are still evaluating data regarding transport times, anecdotally there has been improvement especially with the availability of porters to complete time-sensitive ED patient transports.

ED treatment plan
The ED treatment plan committee has been working to create tools for physicians to enable more consistent and supportive care for a vulnerable population who have a high volume of ED visits. The multi-disciplinary committee has dedicated members from social work, Information Technology, nursing, and the physician group. Several treatment plans have been created and are showing preliminary success.

Delay in transfer to floor document
Delays in transferring patients from ED spaces to available inpatient beds is inefficient and has direct and immediate consequences to capacity and flow. However, it has been identified that there is a high number of patients that are having orders to hold in the ED issued for further treatment or evaluation, despite an available bed on an inpatient unit.
In order to better understand the frequency of this request and the rationale for delaying a patient transfer, we have developed a specific “Request to Delay Transfer Form”. This information will facilitate communication between the admitting services, the ED Nurse Clinician, Bed Booking, and ED administration. The information will provide us with the data to inform operational decisions or changes to ensure that our patients are being provided with the care they require in the most appropriate location.

South Health Campus

The South Health Campus Emergency Department is the newest addition to the city, opening in 2013 to serve the growing communities in the south of Calgary. The SHC ED is seeing a steady rise in patient volumes and acuity each year (5% increase compared to 2016, averaging 186 patients each day). Since opening in 2013 the ED continues to support the SHC hospital pillars of applying innovation, collaboration, and wellness education to patient and family-centered care. Similar to other busy emergency departments, the SHC continues to struggle with overcrowding. This challenge has provided

the opportunity for staff in all areas of the hospital to work together to provide timely and safe emergency care.

Significant Accomplishments 2017

1. **Development of Fast Track/Minor Treatment Area.** Physicians, orthopedic technicians and nurses formed a quality improvement working group to develop an area of the SHC ER focused on the safe and efficient care of minor treatment patients.

2. **Formation of the Quality Improvement Council.** A group of dedicated ED staff meets monthly to design and evaluate quality improvement initiatives. Ongoing and completed projects include: reducing the rate of IV use in intake, improving the layout of the medication room, improving the care of stroke and STEMI patients, designing the fast track area and evaluating and improving the use of the intake area.

3. **Design of a dedicated pediatric care space.** In response to the high numbers of pediatric patients seen at the SHC ED, a funding campaign through the Calgary Health Trust, was started to develop a new treatment area specifically designed for children. A pediatric emergency physician is available for 12 hours each day at SHC.

4. **Physician Float/Physician at Triage.** A group of ED physicians and nurses teamed up to examine the effect of a novel physician shift on length of stay for emergency patients. During the 1 month trial a physician was dedicated solely to departmental flow. Preliminary data suggests that this role lead to an average 12-minute decrease in length of stay for all patients (a saving of 37 hours of wait time on the average volume day). Future work will assess if this role is effective in mitigating overcrowding in Calgary Emergency Departments.

The SHC ED continues to be a fantastic place to work. The highly engaged staff continues to work as a team to face the daily challenges and provide excellent emergency care.

Alberta Children's Hospital

Over the past 12 months the emergency department at the Alberta Children's hospital (ACH) cared for over 85,000 ill and injured children. The high volume and diversity of patients seen in the emergency department ED provides a unique opportunity for training health care providers, generating new knowledge and improving the quality of pediatric care. In the past year we generated new knowledge with the potential to improve outcomes for patients with diarrheal illnesses, severe infections, trauma, abdominal pain, respiratory emergencies and painful injuries. Our team members contributed to the science of resuscitation, precision medicine, quality improvement and simulation. In the past year we had over 52 peer reviewed publications and received substantial funding from local, national and international sources.

The Year in Review:
Clinical: Exceptional care for over 85,000 children provided by a team of 62 physicians and over 200 nurses.

Education: Approximately 275 medical trainees, including medical students, residents and fellows, were trained in the ACH ED.
Research: The research team enrolled over 1200 patients and generated over 52 publications with grant funding totaling $5,706,107 as Principle investigator (PI)/co-PI and $ 8,976,014 as co-investigator/collaborator.

Highlights

Precision Medicine

ACH ED investigators are studying ways to improve the diagnosis of appendicitis through precision medicine bio-profiling. To date, over 350 children have been enrolled in our appendicitis bio-profile studies. This has led us to develop bio-profiles that can be used to separate those children with appendicitis from those other causes of abdominal pain.

Commitment to Comfort

The Commitment to Comfort team received the 2017 Patient Experience Award from the Health Quality Council of Alberta. The Commitment to Comfort Initiative was developed at the Alberta Children's Hospital (ACH) emergency department (ED) to engage families as partners in improving pain outcomes for children. The team includes several members from the Section of Emergency Medicine: Jennifer Thull-Freedman (team lead), Antonia Stang, Shirmee Doshi, Michelle McTimoney, and Erik Saude. Additional members at ACH include nursing leads Erin Pols and Ashley McFetridge, and Project Manager Suzanne Libbey.

Changing the Management of Diarrheal Diseases

The Alberta Provincial Pediatric EnTeric Infection TEam (APPETITE), led by Dr. Stephen Freedman is rapidly altering the approaches to and management of diarrhea in children. The team has shown that collecting stool specimens at home can be replaced by performing rectal swabs at the point of care thereby expediting diagnoses, minimizing inconvenience and biohazard risks to caregivers. The team is actively working with Calgary Laboratory Services and ProvLab Alberta to integrate this new knowledge into clinical care.

Resuscitation

Cardiopulmonary resuscitation (CPR) is the most important treatment for pediatric cardiac arrest (PCA). Although pediatric healthcare providers receive annual basic life support (BLS) training, most struggle to provide guideline-compliant chest compressions during cardiac arrest. The research team at Alberta Children's Hospital is using simulation-based methods to conduct research aimed at improving survival from pediatric cardiac arrest. This include projects designed to determine the best method of training, projects exploring human factors issues during resuscitation, and others research incorporating new technology aimed at improving CPR quality.

Partnerships/Collaboration

The Pediatric Emergency Research Team (PERT) supports the work of collaborators from across the hospital, the University of Calgary, and the entire country. A sampling of current studies include: the diagnosis and management of concussion, the application of precision medicine to sepsis and appendicitis, the impact that early life antibiotic exposure has on the microbiome of neonates and infants, the use of nebulized magnesium sulphate in children with asthma, the use of magnetic resonance

imaging (MRI) in children with suspected appendicitis, and the collection of data on children with abdominal trauma to identify the best approaches to care.

Clinical Informatics

Congratulations to Dr. Tom Rich on his new role at Associate CMIO with AHS! Dr. Matthew Grabove is now the departmental Clinical Informatics Physician Lead and Dr. Shawn Dowling has expanded his role to include SCM Order Set Lead.

Significant accomplishments in 2017:

1. Implementation of the 'My ED DI AVL'
   This list was implemented to allow physicians electronic access to follow-up DI results. Results show up almost as soon as they are available and those coming in specifically after patient discharge are flagged. Although no firm timeline has been established for discontinuing printed DI results, everybody is encouraged to use the DI AVL.

2. Implementation of the 'OK for chairs/needs bed/monitor' icons
   This was developed to facilitate better communication between staff to optimize use of available treatment spaces.

3. SCM 16.3 Upgrade in October
   This major upgrade was a formidable challenge and required months of preparation by IT staff. There were some issues shortly after the upgrade involving hanging Sunray sessions and Citrix window resizing but these have been resolved. There are lingering problems with the SEC tracking board such as font changes and priority numbers failing to clear and these are being actively investigated.

Looking ahead to 2018:

1. Connectcare is on the horizon
   The provincial EMR which will be built on the Epic platform is currently in the planning / organizational stages. The Calgary zone ED will be well-represented throughout this process by Tom, Shawn and Matt, who will be attending initial training in Edmonton in January followed by monthly directional-setting sessions.

2. Emergency Department Session Persistence (EDSP) Project
   A provincial initiative to replace Sunray card readers with a standardized proximity card access to terminals in the ED. This has already been successfully implemented in several other ED's in the province and is an important step as our Sunray terminals reach the end of their lifespan and are difficult to maintain. Currently in the planning stages, implementation of the proximity card access system is envisioned for Q3/4 2018.

3. Slow-down for SEC/SCM changes:

   Because zone IT staffing resources are being diverted to Connectcare, there will be a definite slow-down in changes being implemented in SCM. Critical safety issues and fixes will continue to be addressed as well as other projects when possible.

4. Structured handover note in SCM:

   A build request has been submitted based on the I-PASS style handover note. Because of above-mentioned IT constraints, no timeline has yet been set for implementation.

Medical Education

CCFP-EM Program

The CCFP-EM program has had a successful year. We are fortunate to continue to have excellent support through our physician group and thank all of our physicians involved in educating our CCFP-EM residents. Our longitudinal preceptors continue to make an impressive contribution to the education of our residents and we are thankful for their contributions.
The CCFP-EM SIM program now has 2 parallel streams. In-situ SIM is lead by Dr. Stuart Rose and Laurie Leckie RN. It is held monthly in the resuscitation bay of the Rockyview Hospital and is one of the most advanced SIM curriculums in a CCFP-EM program. The SIM classics program is lead by Dr. Scott Seadon and takes place in the ATSSL. This has been a valuable edition to our curriculum and has increased active learning during our academic full day.
Our Ultrasound curriculum is lead by Dr. Dan Joo and continues to be a favourite of the residents.
Exam preparation curriculum is lead by Dr. Charles Wong, who has made significant improvements in the curriculum over the past year.
Our innovative resident wellness curriculum is lead by Dr. Nadim Lalani.
Drs. Eddy Lang, Andrew MacRae, James Andruchow, and Eddy Lang have all been strong supporters of scholarly work in the program.
We are also thankful for the support of our residents, program and program director through the Physician Support Fund.

Our connection to our rural and regional partner sites continues to be strong and these continue to be highly rated educational experiences for our residents.
Our CARMS selection process continues to work well and our program remains oversubscribed with 119 applications for our 8 residency positions this past cycle.

The CCFP-EM program underwent a scheduled internal review as part of the Family Medicine internal review. We look forward to helpful feedback about our program, due in February of this year.

On a national level the CCFP-EM programs continue to work towards developing a competency based educational strategy that will work for CCFP-EM training. We have already begun faculty development on giving feedback, both here in Calgary and at our rural and regional sites as part of this shift.

Our office staff, Tris and Madhavi, have been excellent supports for our program.

The excellent educational environment in Calgary as well as openness to innovation continues to make our program sought after and a leader in CCFP-EM training in the country.

Off-Service and elective medical Education (2016-2017)

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 107 mandatory off-service learners during the 2016-2017 academic year. This represents approximately 13,700 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 (84 learners), while the remainder came from plastic surgery (2 learners), orthopedic surgery 4 learners), general surgery (4 learners), neurology (4 learners), dermatology (3 learners), dental medicine (2 learners) and internal medicine and cardiac 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 2016-2017 academic year, the Department of Emergency Medicine received elective requests from 75 residents (mostly family medicine) and 74% of these residents were offered electives. We hosted 45 elective residents (down from 69 in 2015-2016) with requests from the University of Calgary (31 residents), UBC (10 residents), U of A (3 residents), U of T (6 residents), U of O (4 residents), and other Canadian schools. Notably, we hosted 6 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 student side, in the 2016-2017 academic year the Department of Emergency Medicine received elective requests from 175 medical students and 73% of these students were offered electives. We hosted 98 elective students (down from 152 in 2015-2016) with requests from the University of Calgary (41 clerks), UBC (16 clerks), U of A (14 clerks), U of T (15 clerks), UWO (7 clerks), U of O (18 clerks), McMaster (23 clerks), Queens (7 clerks), U of M (8 clerks), U of S (7 clerks), Dalhousie (6 clerks), as well as a few requests from each of the other Canadian schools. The 143 elective learners we hosted in 2015-2016 represent over 10,000 hours of direct 1:1 learner supervision by our teaching faculty. We were also able to host 21 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 2016-2017 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. A new addition this year has been a trial of SIM based learning for visiting medical students. This has been well received and will potentially expand in scope next year.

University of Calgary Emergency Medicine Clerkship

The class of 2017 completed their clerkship in April 2017. 147 students completed their mandatory emergency rotation in Calgary. The remainder completed their emergency department rotations through their UCLIC sites. The overall ranking for the mandatory Calgary based emergency rotation was 4.1, slightly higher than the class of 2016 ranking which was 4.0. The 4.1 resulted in a ranking of 3rd (tied with Anesthesia) out of the 8 mandatory clerkship rotations. Psychiatry and O&G were ranked 4.4 and 4.3 respectively.

During the year we ceased using daily paper evaluations and began using daily online "one45" evaluations. Along with this change the daily in training evaluation report (ITER) was modified to match the final ITER and this has made the evaluation process far more efficient and likely more precise. Students were also given SunRay cards which allow them to more efficiently utilize online resources such as Sunrise Clinical Manager and Netcare.

Student identified strengths of the rotation include the quality of on-shift teaching (the vast majority of shifts involve working directly with the staff physician with no other team members), the quality of scheduled teaching sessions and the balance of responsibility and supervision.

Students provided feedback that they wanted more minor treatment exposure in order to gain more procedural experience. In response to this an extra minor treatment shift will be added to their schedule starting in 2018.

We plan to maintain and hopefully improve the educational experience for clerks in 2018.

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. Danny Peterson, MD
ED Ultrasound Coordinator

It's been another successful year for Point of Care Ultrasound in our Emergency Departments here in Calgary. A new machine has been added to FMC (Edge II) with two more expected with the new renovations. We're hoping to relocate any extra machines to other sites in need. Stay tuned!

There are a lot of great ultrasound people here in Calgary and we've organized them into specific roles outlined below:

1. Site leads:
    - ACH: Mark Bromley
    - SHC: Mike Wolf
    - RGH: Charles Wong
    - PLC/FMC: Danny Peterson
2. Resident Education Lead: Kasia Lenz
3. Co-Chair for CAEP 2018: Conor McKaigney
4. Instructors/Educators (EDE courses, Senior Ultrasound Curriculum, Scanning sessions etc.): Dan Joo, Ping Chen, Huma Ali, Paul McKenna, Kip Rodgers, Jibran Sharif, Hannah Park, Tim Souster

Paul McKenna successfully completed his focused year in Point of Care Ultrasound and achieved his RDMS status. He's been a great addition to the ultrasound instructors we're lucky enough to have here in Calgary. We're looking forward to Nick Packer being the next to step up and be our next ultrasound "fellow".

In 2018 we're looking forward to hosting two dedicated Point of Care Ultrasound tracks at CAEP in May. We're bringing in some speakers from around the country with a little local talent mixed in. There will also be a Sonogames competition that should provide entertaining and educational!

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

2017 was another successful year for the Poison and Drug Information Service (PADIS) and for Clinical Pharmacology and Toxicology (CPT) in Calgary.

In July, the Royal College approved our application for a CPT residency program in Calgary, making ours the fourth such program in the country and the first in Western Canada. We participated in the CaRMS application process for the Medicine R4 subspecialty match in the summer and interviewed two applicants for one position.

In November, we successfully matched our very own Dr. Steven Liu to the program, who will start in July 2018. Next steps are to continue to meet with PGME representatives from the University of Calgary to work out the details of various rotations. This is a major accomplishment for Calgary to help alleviate the chronic manpower shortage of local physicians trained in CPT, and will ideally have all PADIS toxicologists eventually living and working in Alberta in the future. A big congratulations and thanks go out to Dr. Scott Lucyk and Stephanie Schwartz for their hard work in completing the Royal College application and coordinating the interview process.

As part of preparing for the start of the CPT residency, work has begun on developing a Clinical Pharmacology consultation service at the FMC. This service would complement the existing Medical Toxicology service at PADIS which already sees acutely poisoned patients. The mandate of the CP consult service is to provide advice on Clinical Pharmacology patient scenarios such as adverse drug events, uncontrolled hypertension, substance withdrawal, deprescribing, and unusual responses to medications. It will be launched in September 2018.

This year, Scott Lucyk was also the recipient of the Department of Critical Care Medicine's Off Service Preceptor of the Year award as well as the Department of Emergency Medicine Rookie of the Year award. Well done Scott!

In the 2017 academic year, PADIS welcomed 42 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. We also continue to have Saskatchewan RCPSC and CCFP-EM residents take call from Regina and Saskatoon, and our annual "Toxicology Skills Days" continued in Edmonton and Saskatoon this year.

Our medical toxicology clinic continues to see patients monthly at the Holy Cross ambulatory care centre. 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 exposures this year included lead, cobalt and hydraulic fracturing by-products.

PADIS toxicologists had six abstracts accepted for presentations at the annual North American Congress of Clinical Toxicology in Vancouver. All abstracts were published in the August 2017 issue of Clinical Toxicology. In addition, PADIS toxicologists were authors on several manuscripts.
Dr. Morgan Riggan joined our PADIS toxicologist group in July 2017 after completing her fellowship in New York City. She has been a welcome addition to our staff. In 2017 we also said goodbye to Dr. Ryan Chuang and Sophie Gosselin as PADIS toxicologists.
Finally, on November 18, PADIS hosted yet another successful one-day clinical toxicology conference in the Health Sciences Centre. Dr. David Juurlink was the keynote speaker. He spoke on his perspectives regarding the North American opioid crisis as well as advice for health care professionals on using Twitter. Over 180 attendees registered for the conference. The next iteration of this conference will be in 2020.

Emergency Medicine Research

Andrew McRae, MD, PhD
Research Chief

The 2017 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.

2017 saw the expansion of the research infrastructure to Rockyview General Hospital, including the presence of embedded research assistants in the RGH ED 7 days/week.

Ongoing studies in the Calgary Zone EDs include a randomized trial of electrical vs. chemical cardioversion of symptomatic atrial fibrillation, the evaluation of streamlined diagnostic pathways for older and pregnant patients with suspected deep venous thrombosis, a trial evaluating the effectiveness of linking seniors with minor injuries to community exercise/fall prevention programs, a trial of the effectiveness of femoral nerve blocks for hip fracture pain, a trial of plastic wrap as a temporary dressing for burns, and observational studies to improve risk prediction of severe post-concussion symptoms and the need for intervention for urinary stones.

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

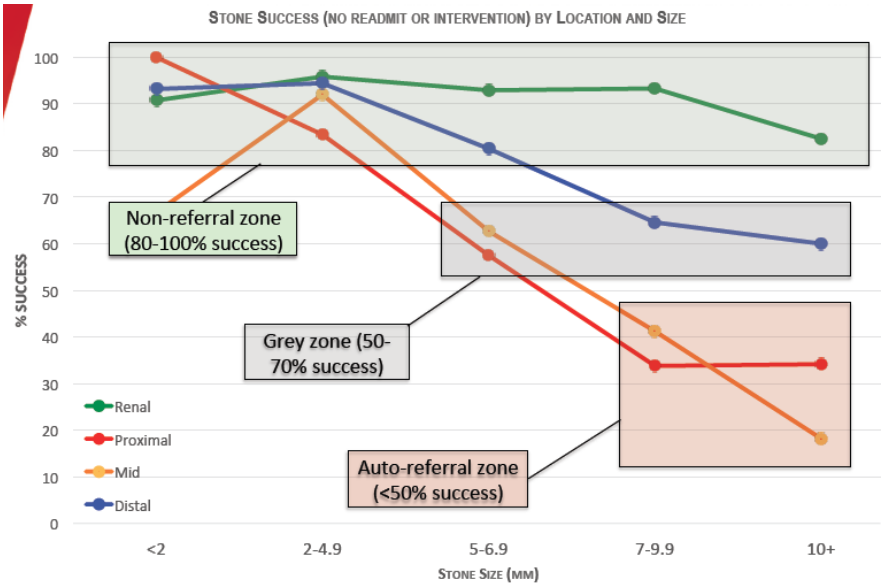
Research Day 2017 had over 150 attendees. Dr. Amy Plint of the Children's Hospital of Eastern Ontario spoke eloquently on the intersection of clinical research and clinical care in the ED, and a panel discussed interventions to promote healthcare provider wellness.

Katrina Koger continues to provide exemplary support to the research program. Dr. Heidi Boyda and Tristan Holotnak continued to prove invaluable in their roles as the departmental Research Coordinators. The FMC and RGH research assistant teams facilitate collection of high-quality data in the emergency department.

Renal Colic Project

Our two-city renal colic study of 3283 patients with CT-proven ureteral stones is about to be published in CJEM. This showed that patient and stone characteristics were similar in Calgary and Vancouver but that Calgary patients were more likely to be hospitalized (55.6% vs. 10.3%) and undergo urological intervention (52.1% vs. 7.5%) during their index visit. Calgary patients also had higher 60-day ED revisit and hospitalization rates (29.7% / 14.3% vs. 22.6% / 6.5%). Stent pain seemed to be a big factor in causing revisits, but also post-op ureteral edema or spasm causing obstruction, incomplete stone removal, infection, and unexpected ongoing post-procedural pain (because patients thought pain would resolve immediately after stone removal). The bottom line was that patients with small stones (5mm or less) did better in Vancouver and patients with large stones did better in Calgary. Because 75% of stones are "small" overall outcomes looked better in Vancouver.

In a sub-study looking at predictors of spontaneous passage failure (manuscript in preparation), we found that the worst prognosticators are a proximal stone (OR=7.8) or middle stone (OR=5.5), followed by increasing stone width (OR=1.2 for each mm of size). It was possible to build a referral model (below), where the high-risk group (5% of patients, and passage success rate <50%) included all proximal or middle stones >7mm; the intermediate risk group (16% of patients, and passage success rate=50-70%) included distal stones >7mm and proximal/middle stones >5mm; while the low risk group (79% of patients, and passage success rate >80%) included all others. In patients who get a CT, these might be helpful referral guidelines.



We also studied the prognostic value of (moderate-severe) hydronephrosis in 1828 patients and found that this finding is not correlated with stone size. It is 55% sensitive and 71% specific for stones >5 mm with likelihood ratios of 1.9 and 0.64 (relatively useless). Hydro does changes physician behavior. Patients

with moderate hydro had OR of 4.6 for admission (9.8 for severe hydro). In patients who did not undergo an immediate intervention (i.e. were allowed to try and pass their stone, there was no correlation between degree of hydro and patient outcome. The likely reason for this is that the stones most likely to pass (small, distal) often cause severe sx and hydro. Take home message: In a patient with no underlying renal compromise, hydro should probably not be a driver of referral or admission. This study was presented at CAEP and SAEM , and is now a draft manuscript.

Our ongoing research is the 10 day patient follow-up study (224 patients enrolled as of December), where we are calling patients to see what their qualitative experience is after ED management. Ironically, enrollment in this study has been slow because patients need imaging and since the renal colic protocol was implemented we are doing about 205% fewer CTs.

Preliminary results show that 2/3 of patients had at least one major adverse experience during 10day follow-up: 46% reported that the daily impact of pain was >4/10; 39% described their health status as only poor or fair; 37% required >7days for return of normal function; 28% had >2 severe pain episodes per day; 28% required ED revisit or hospitalization; 20% required >2 opioid doses/day; and 10.7% lost >7 work days.

We also asked patients what drugs they were prescribed and how much they actually used (information that should help guide prescribing behavior). Two-thirds received tamsulosin and 82% got opioids. Only half received NSAIDS (very low given their effectiveness, but we believe many patients were advised to use OTC NSAIDs). One-third received tamsulosin+NSAID, 40% opioid+NSAID and 28% tamsulosin-NSAID-opioid combination. Of 109 patients prescribed an NSAID, only 64% took ≥ 1 dose/day. Mean NSAID intake in the overall study group was 1.1 doses/day from day 1-5 and 0.6 doses/day on days 6-10, with 90%ile values of 3.0 and 2.0 doses/day*. NSAID compliance was twice as high in patients who stated they received high quality discharge instructions (64%% vs. 32%). Mean opioid intake in the overall study group was 1.2 doses/day from day 1-5 and 0.5 doses/day on days 6-10, with 90%ile values of 4.0 and 2.0 doses/day. Among patients prescribed tamsulosin, the average was 4.0 days of compliance, with a 90%ile value of 10 days. These data suggest that patient compliance is relatively poor and that better discharge instructions are an important factor.

*If you prescribed the 90%ile value, this would presumably be enough drug 90% of the time.

Reminder: The qualitative renal colic outcome study is still ongoing. If you see a patient with image proven ureteral stone, please get them enrolled. This is as simple as asking them: “Is it ok if a researcher calls in 10 days to see how you are doing”, then putting one of their demographic stickers on the (hopefully orange) study forms that are supposed to be in the intake areas.

Other updates: Manuscript discussing hospital accountability strategies, using the outcomes of the provincial overcapacity protocol on ED outflow block, has been tentatively accepted for publication in “Canadian Healthcare Forum” (an administrator type journal). Another manuscript on the size of access block at 25 Canadian centres (it’s not that big and can be solved) is now being considered by CMAJ Open. Another manuscript studying the impact of conversion from contract payment to fee for service (bottom line: no sustained impact) to be published in CJEM in March.

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 past year this project has undertaken an evaluation at Foothills Medical Centre which found a 6.3% drop in the admission of low acuity UGIB patients. An evaluation of Dr. Dowling's changes to UGIB order sets found a 33% decrease in pantroprazole infusion orders. An "Iron Summit" was held in Calgary bringing together 45 clinical leaders from 9 departments to advance the appropriate management of iron deficiency anemia patients through increased access to outpatient IV Iron and to streamline the referral process. Work is underway in collaboration with Day Medicine to execute these objectives. The Emergency SCN has begun collaboration discussions with the Digestive Health SCN focused on advancing best clinical practices within the final year of this grant, as well as legacy research and clinical sustainability.

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.

   The 12 month RCT concluded in the Calgary Zone in August 2017, and during the study period clinical decision support was accessed 2198 times by emergency physicians prior to placing CT orders. Analysis of clinical and health system outcomes from the trial is ongoing and results will be published in 2018. Upon conclusion of the study clinical decision support was maintained within Sunrise Clinical Manager, and was expanded in scope with the elimination of control groups. Between September-December 2017 clinical decision support was accessed over 2000 times. Individual physician performance reports on CT ordering were provided during the study period, and in 2018 will be integrated into existing performance reports within the Zone.

PRIHS 3

Evaluation of the Connect 2 Care (C2C) Team for Vulnerable Patients with Complex Need*s*

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 one such 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 2017

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 A, Novak K, Zanten SV.
   FUNDING AGENCY: Alberta Innovates – Health Solutions PRIHS
   TOTAL AMOUNT GRANTED: $699,000
   PERIOD: 2015-2017

2. **PROJECT:** Improving the Stewardship of Diagnostic Imaging Resources in Alberta Emergency Departments
   INVESTIGATORS: Lang E, McRae A, Holroyd B, Rowe B, Emery D, Andruchow J, Bullard M, Sevick R.
   FUNDING AGENCY: Alberta Innovates Health Solutions (AIHS) - Partnership for Research and Innovation in the Health System (PRIHS)
   TOTAL AMOUNT GRANTED: $750,000
   PERIOD: 2014-2017

3. **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 *et al*.
   FUNDING AGENCY: Peer Review Committees and Mandates - Open Operating Grant Program (OOGP)
   TOTAL AMOUNT GRANTED: $329,928
   PERIOD: 2013-2017

4. **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 *et al*.
   FUNDING AGENCY: Canadian Institutes of Health Research (CIHR) Network Grants
   TOTAL AMOUNT GRANTED: $4,350,000
   PERIOD: 2013-2018

5. **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 *et al*.
   FUNDING AGENCY: Canadian Institutes of Health Research (CIHR) Open Operating Grants
   TOTAL AMOUNT GRANTED: $414,179
   PERIOD: 2015-2018
6. **PROJECT:** Optimal Management of Low-risk Syncope Patients
   INVESTIGATORS: Thiruganasamandamoorthy V, Sivilotti M, Morris J, Hohl C, Huang P, Lesage N,

Krahn A, McRae A *et al*.
FUNDING AGENCY: Network for Centres of Excellence (NCE), Canadian Arrhythmia Network (CANEt)
TOTAL AMOUNT GRANTED: $730,344
PERIOD: 2015-2018

7. **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

8. **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

9. **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

10. **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 *et al*.
    FUNDING AGENCY: Canadian Traumatic Brain Injury Research Consortium (CTRC)
    TOTAL AMOUNT GRANTED: $25,000
    PERIOD: 2016 – 2018

11. **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 *et al*.
    FUNDING AGENCY: Canadian Institutes of Health Research (CIHR)
    TOTAL AMOUNT GRANTED: $760,676
    PERIOD: 2016 – 2018

12. **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 E *et al*.
    FUNDING AGENCY: Canadian Institutes of Health Research (CIHR)
    TOTAL AMOUNT GRANTED: $1,643,676
    PERIOD: 2016 – 2019

13. **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

14. **PROJECT:** Apixaban Versus Low Molecular Weight Heparin for Treatment of Catheter Related Thrombosis in Cancer Patients- A Pilot Study to Assess Feasibility of a Randomized Controlled Trial
    INVESTIGATORS: Lang E, Suryanarayan D.
    FUNDING AGENCY: CRF-Seed Grant
    TOTAL AMOUNT GRANTED: $30,000
    PERIOD: 2017

15. **PROJECT:** Evaluating Innovations in Transition to Adult Care: Transition Navigator Trial
    INVESTIGATORS: Dimitropoulos G, Mackie A, Samuel S, Guilcher G, Klarenbach S, Lang E.
    FUNDING AGENCY: Canadian Institutes of Health Research (CIHR)
    TOTAL AMOUNT GRANTED: $100,000
    PERIOD: 2017

16. **PROJECT:** Improving Health Care Practices and Processes Through Behavioural Change
    INVESTIGATORS: Bijvank M, Bischak D, Falkenberg L, Ganjouhaghighi N, Huq JL, Mourali M, Woiceshyn J, Carter M, Coutts S, Lang E *et al*.
    FUNDING AGENCY: 2017 Haskayne Transformative Research Grant/ University of Calgary
    TOTAL AMOUNT GRANTED: $240,500
    PERIOD: 2017

17. **PROJECT:** Social Determinants of Post-discharge Readmissions, Emergency Department Visits, and Mortality in Medical Inpatients
    INVESTIGATORS: Ghali W, Musto R, Falvo N, Godley J, Lang, E *et al*.
    FUNDING AGENCY: Canadian Institutes of Health Research (CIHR)
    TOTAL AMOUNT GRANTED: $154,375
    PERIOD: 2016-2018

18. **PROJECT:** CanVECTOR (Canadian Venous Thromboembolism Clinical Trials and Outcomes Research) Network
INVESTIGATORS: Lang E *et al*.
FUNDING AGENCY: Canadian Institutes of Health Research (CIHR)
TOTAL AMOUNT GRANTED: $750,000
PERIOD: 2015-2018

19. **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 *et al*.
FUNDING AGENCY: Canadian Institutes of Health Research (CIHR)
TOTAL AMOUNT GRANTED: $742,083
PERIOD: 2012-2017

20. **PROJECT:** Pain Management from Skin-Breaking Procedures in Neonates: Knowledge Synthesis and Practice Guidelines
INVESTIGATORS: Lacaze-Masmonteil T, Shah V, Taddio A, Denise M, Lang E *et al*.
FUNDING AGENCY: Canadian Institutes of Health Research (CIHR)
TOTAL AMOUNT GRANTED: $100,000
PERIOD: 2016-2017

21. **PROJECT:** The Development and Evaluation of an Assessment Tool for Competency in Point-of-Care Ultrasound in Emergency Medicine
INVESTIGATORS: McKaigney C.
FUNDING AGENCY: OHMES Research & Innovation Funding Competition
TOTAL AMOUNT GRANTED: $6000
PERIOD: 2017-

22. **PROJECT:** Development and Evaluation of the Airway Management Pause Improvement Charter
INVESTIGATORS: Huffman J, Laerz T, Wylie B.
FUNDING AGENCY: Chief Medical Office (CMO)/Calgary Zone Medical Affairs Quality Improvement Initiative Grant
PERIOD: 2017-

23. **PROJECT:** Innovations in Transition to Adult Care: Well on Your Way Program
INVESTIGATORS: Samuel S, Mackie A, Dimitropoulos G, Nettel-Aguirre N, Klarenbach S, Pacaud D, Lang E *et al*.
FUNDING AGENCY: BMO Endowed Research Award in Healthy Living, Alberta Children's Hospital Research Institute
TOTAL AMOUNT GRANTED: $300,000
PERIOD: 2017-2020

24. **PROJECT:** The Transition Navigator Trial: Evaluating a patient navigator service to improve transition to adult health services for youth and young adults with chronic health conditions
INVESTIGATORS: Samuel S, Mackie A, Dimitropoulos G, Nettel-Aguirre N, Klarenbach S, Pacaud D, Lang E *et al*.
FUNDING AGENCY: Health Outcomes Improvement Fund, Maternal Newborn, Child and Youth Strategic Clinical Network, Alberta Health Services
TOTAL AMOUNT GRANTED: $375,000
PERIOD: 2017-2020

Publications in 2017

1. Lang, E. and Crooks, S. Prevalence of pulmonary embolism in syncope patients. CJEM. 2017. Jul 31:1-3.
2. Socransky, S., Lang, E., Bryce, R., Betz, M. Point-of-Care ultrasound for jugular venous pressure assessment: Live and online learning compared. Cureus. 2017 Jun 8;9(6):e1324.
3. Clinkard,D., Stiell, I., Lang,E., Rose,S., Clement,C., Brison,R., et al. Between- and within-site variation in medication choices and adverse events during procedural sedation for electrical cardioversion of atrial fibrillation and flutter. CJEM. 2017. pp. 1-7.
4. Turner,S., Lang,E., Brown,K., Leyton,C., Bulger,E., Sayre, M. et al. Is prehospital care supported by evidence-based guidelines? An environmental scan and quality appraisal using AGREE II, CJEM. 2017. May: 19 (1) pp. S35-S36.
5. Stewart, D., Wang, E., Lang, E., Innes, G. Are EMS offload delay patients at increased risk of adverse outcomes? CJEM. 2017. May 19 S1): p. S38.
6. Pedersen, E., Lang, E. Evaluation of the effect of nightshifts on patient outcomes: a multi-center study. CJEM. 2017. May 19 (S1): p. S44.
7. Andruchow,J., Grigat, G., McRae, A. Innes, G. Lang, E. Implementation of an electronic clinical decision support tool to improve knowledge translation and imaging appropriateness for patients with mild traumatic brain injury and suspected pulmonary embolism. CJEM. 2017. May 19 (S1): pp. S34-S35.
8. Leong,M., Lang, E., Coutts,S., Stang,J., Wang, D., Patocka, C. Geographic variation in Transient Ischemic Attack (TIA)/minor stroke care in Alberta emergency departments (EDs). CJEM. 2017. May 19 (S1):p. S49.
9. Berthelot, S., Lang, E., Émond,M., Mallet,M., Stelfox, H., Lavergne, R. et al. An international consensus study to identify quality indicators for ambulatory emergency care. CJEM. 2017. May 19 (S1): pp. S62-S63.
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11. Alexiu, C., Krebs, L., Villa-Roel, C., Kirkland,S., Holroyd,B., Ospina,M. et al. Headache presentations to emergency departments in Alberta: understanding investigative approaches. CJEM. 2017. May 19 (S1): p. S45.
12. Alexiu,C., Krebs, L., Villa-Roel, C., Holroyd, B., Ospina, M., Pryce, J. et al. Acute asthma presentations to emergency departments in Alberta: an epidemiological analysis of presentations. CJEM. 2017. May 19 (S1).

13. Andruchow,J., Grigat, D., McRae, A. Innes, G. Lang, E. Implementation of a voluntary provincial knowledge translation intervention project to improve the appropriateness of CT imaging for patients with mild traumatic brain injury and suspected pulmonary embolism. CJEM. 2017 May 19 (S1): p. S80.
14. Andruchow,J., McRae, A., Abedin, T., Wang, D., Lang, E., Innes, G. Very low concentrations of high-sensitivity troponin T at presentation can rapidly exclude acute myocardial infarction in a significant proportion of ED chest pain patients. CJEM. 2017 May 19 (S1): p. S28.
15. Villa-Roel, C., Borgundvaag, B., Majumdar, S., Leigh, R., Bhutani, M., Lang,E. Measuring health-related outcomes: is social desirability bias an issue we should be exploring while conducting emergency department research?. CJEM. 2017. May 19 (S1): pp. S119-S120.
16. Li, S., Siarkowski, M.,Trajkovski, A., Umakanthan, A., Kishibe,T., Lang, E. Patient-centered outcomes with use of CT angiography in patients presenting with acute stroke and TIA: a systematic review and meta-analysis. CJEM. 2017. May 19 (S1): p. S55.
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18. Wong, C., Young, P., Ross, M., Robertson H., Lang, E. The accuracy and prognostic value of point-of-care ultrasound for renal colic: a systematic review. CJEM. 2017. May 19 (S1): p. S56.
19. Wang, A., Lonergan, K.,Wang, D., Lang. E. Are we transfusing wisely? An analysis of transfusion practices among hemodynamically stable patients with anemia in four hospitals. CJEM. 2017. May 19 (S1): pp. S120-S121.
20. Villa-Roel, C., Bhutani, M., Majumdar, S., Leigh, R., Borgundvaag, B., Lang, E. et al. Outpatient care gaps in subjects presenting to emergency departments with acute asthma.CJEM. 2017. May 19 (S1): p. S50
21. Innes, G., Stewart D., Wang, D., Lang, E. System and patient level determinants of EMS offload delay. CJEM. 2017. May 19 (S1): p. S39.
22. Andruchow, J., McRae, A., Abedin, T., Wang, D., Innes, G., Lang, E. Validation of the HEART score in Canadian emergency department chest pain patients using a high-sensitivity troponin T assay. CJEM. 2017. May 19 (S1): pp. S61-S62.
23. Villa-Roel, C., Majumdar, S., Leigh, R., Senthilselvan, A., Bhutani, M., Borgundvaag, B. et al. Emergency department directed multifaceted interventions to improve outcomes after asthma exacerbations: a 3-armed randomized controlled trial. CJEM. 2017. May 19 (S1): p. S50.
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pp. 372-380.
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29. Stiell, I., Artz, J., Lang, E., Sherbino, J., Morrison, L., Christenson, J. et al. An Environmental Scan of Academic Emergency Medicine at the 17 Canadian Medical Schools: Why Does this Matter to Emergency Physicians? CJEM. 2017. Jan 19 (1): pp. 39-46.
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31. Reay, G., Norris, J., Hayden, K., Abraham, J., Yokom, K., Lazarenko, G. et al. Transition in care from paramedics to emergency department nurses: a systematic review protocol. Syst Rev. 2017. Dec 19;6(1):260.
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38. Clinkard, D., Stiell, I., Lang, E., Rose, S., Clement, C., Brison, R.et al. Between- and within-site variation in medication choices and adverse events during procedural sedation for electrical cardioversion of atrial fibrillation and flutter.CJEM. 2017 Jun 7:1-7.
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Current Emergency Medicine Notable Mentions

1. Dr. Joe Vipond's work (22 public/academic speaking events and multiple initiatives to improve the climate/environment:

   - Climate advocacy
     - February 10/17: University of Calgary, SOWK 632 : Social Policy & Social Justice: Making the Impossible Merely Difficult: the Alberta Coal Phase Out Campaign
     - February 25/17: Alberta Ecotrust Ecogathering : Mobilizing Citizens with Social Media
     - March 16/17: Alberta Institute of Agrologists: Medical Challenges with Coal
     - April 26/17: Pembina Institute Wind Workshop (participant)
     - May 6/17: Calgary Foundation Jane's Walk (co-presented with Pembina Institute): Climate Optimist Ramble
     - June 26/17: City of Calgary Awards (recipient): Environmental Achievement Award
     - September 12/17: Sidewalk Citizen Tzavta: Cognitive Dissonance and Alberta's Climate Crisis
     - September 20/17: NAIT Renewable Energy Program: Cognitive Dissonance and Alberta's Climate Crisis
     - October 17/17: University of Calgary EcoClub: Cognitive Dissonance and Alberta's Climate Crisis
     - October 30/17: University of Calgary Med Students: Physician Advocacy on Climate Change
     - November 1/17: University of Calgary Global Health Symposium: Physician Advocacy on Climate Change
     - November 10/17: Calgary WHO simulation: Challenges and hopes on climate change
     - November 11/17: Family Medicine Forum, Montreal: Physician Advocacy on Climate Change
     - November 12/17: Model UNFCC, Montreal: Albertan/Canadian Coal Phase Out
     - November 13/17: McGill University, Montreal: Physician Advocacy on Climate Change
     - Novemver 13/17: University of Ottawa Fam Med residency: Physician Advocacy on Climate Change
     - November 14/17: University of Ottawa Medical School Enviromed Group: Physician Advocacy on Climate Change

- November 15/17: University of Toronto Grad Class: Social, Political, and Scientific aspects of primary care: Physician Advocacy on Climate Change
- November 16/17: Queen's University: Cognitive Dissonance and Canada's Climate Crisis
- November 17/17: Queen's University: Physician Advocacy on Climate Change
- December 7/17: University of Edmonton Medical School: Physician Advocacy on Climate Change
- December 7/17: City of Edmonton Change for Climate: Health Impacts of Climate Change

- Ongoing:
  - Director, Alberta Wilderness Association
  - Director, Canadian Association of Physicians for the Environment
  - Participant, Calgary Climate Hub
  - Participant, Alberta Climate Network
  - Participant, Alberta Ecotrust Advisory Committee for Environmental Gathering
  - Organizer/Founder, CAPE-Alberta

2. Dr. Tim Souster's International Transition

- Dr. Tim Souster continues to engage the Middle East. Earlier this year, Tim spent a month in Mosul, Iraq working with Samaritan's Purse in their trauma hospital. The purpose of the trip was to care for those injured during Iraq's civil war. The majority of patients served were civilians injured by the fight between ISIS and the Iraqi Special Forces.

  Since then, Tim has had a continued interest in the region and has been exploring employment opportunities to transition permanently to the Middle East. After spending a month in the United Arab Emirates with his family, he applied to work for Cleveland Clinic Abu Dhabi as a full time emergency physician. After completing upwards of 50 interviews in the U.S. and the U.A.E., he has officially signed a permanent contract and will be transitioning with his family in April 2018.

  Tim completed his residency training in Calgary in 2012-2013 and has been working primarily at the South Health Campus site since then. He has contributed to the departmental activities by writing and teaching regional anesthesia techniques and has also served as an RMES co-director and on the manpower committee. Tim received the South Health Campus Rookie of the Year Award in 2014 and recently was awarded the Departmental Humanitarian of the Year in 2017 for his volunteer efforts in Mosul, Iraq.

Tim would like to recognize the Department of Emergency Medicine in Calgary for the support of many members throughout his training and early career. "Calgary has been an incredible place to work and has positioned me to be a competitive candidate on the international stage. Without the opportunities and support of Calgary EM, it's unlikely I would be in the position I am today." Tim hopes that his work with Cleveland Clinic in Abu Dhabi will allow him more opportunity to serve in humanitarian roles around the world in the future.

- Related Calgary Herald Article
  - http://calgaryherald.com/news/local-news/calgary-doctors-on-samaritans-purse-medical-mission-treat-victims-in-northern-iraq

3. Leaders in Medicine (LiM) Symposium

- The ninth annual Leaders in Medicine (LiM) Symposium was a great success, with over 200 expected attendees and guests, renowned keynote speakers, and mentorship from LiM alumni from across the country. This year's symposium commemorated a significant milestone of the LiM program, celebrating 20 years of dedication to the training of clinician-scientists. The 2017 LiM Symposium would not have been possible without the generous contributions of faculties, departments, and institutions across the University of Calgary campus. This support continues to provide students with a forum to celebrate their research, and participate in both personal and professional growth. On behalf of the LiM program and attendees of the ninth annual LiM Symposium, we would like to thank you for your continued support.

4. Funding for the Construction of the SHC Emergency Pediatric CPOD

- An anonymous donor has donated the entire $3.9 million to build the pediatric C pod at the South Health Campus. The pod should be ready by late Fall of 2018.

5. SAEM Advanced Research Methodology Evaluation and Design (ARMED) course

- Calgary's own ED physician, Dr. Charles Wong has been selected as a participant in this inaugural class that runs from September 2017 to May 2018

6. PHArmacists' perspective oN the Take hOme naloxone program (The PHANTOM Study)

- Jenny Edwards, BScPharm, ACPR; Duane Bates, BScPharm, ACPR; Brett Edwards, BSc, BScPharm, MD; Sunita Ghosh, PStat, PhD; Mark Yarema, MD, FRCPC

ABSTRACT

Objective: To evaluate pharmacists' attitudes toward the Take Home Naloxone (THN) program and identify areas that could be improved to support pharmacists' involvement.

Methods: Pharmacists on the Alberta College of Pharmacists' directory were invited to complete an online survey between July 10 and August 8, 2016. The survey consisted of 19 questions. Descriptive statistics were used to analyze the data.

Results: Four hundred seventy pharmacists completed the survey (response rate = 11.2%). A total of 76.8% of respondents strongly agreed or agreed that pharmacists should be screening patients to identify those at risk of opioid overdose. Full-time pharmacists were more likely to agree ($p = 0.02$). A total of 79.8% of respondents strongly agreed or agreed that pharmacists should be recommending THN kits. Pharmacists working in large population centres ($p = 0.008$) and full-time pharmacists ($p = 0.02$) were more likely to agree with this statement. Furthermore, 60.6% of pharmacists were extremely willing or very willing to participate in the THN program. Pharmacists in practice for ≤15 years were more willing to participate in the THN program than pharmacists in practice >15 years ($p = 0.03$). The most common perceived barriers to implementation of the THN program were lack of time in pharmacists' current work environment and education about the program.

Conclusions: Overall, pharmacists had positive attitudes toward screening patients to identify those at risk of opioid overdose, recommending THN kits and willingness to participate in the program. Factors that may facilitate increased participation in the program include addressing time issues and improving education about the THN program. *Can Pharm J (Ott)* 2017;150:259-268.

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