

RESEARCH DAY 2018

*University of Alberta
Department of Emergency Medicine
Faculty of Medicine and Dentistry*

Tuesday, June 12th, 2018

*Katz Group Centre for Pharmacy and Health
Research*



UNIVERSITY OF
ALBERTA

RESEARCH DAY AGENDA (KATZ 1-080)

- 08:00 – 08:30 **Registration – Katz Atrium**
- 08:40 – 08:50 **Overview of the Day – Professor Christopher McCabe**, Research Director, Department of Emergency Medicine, Faculty of Medicine & Dentistry, University of Alberta
- 08:50 – 09:00 **Welcome Address – Dr. David Evans**, Vice-Dean of Research, Faculty of Medicine & Dentistry, University of Alberta
- Moderator: Dr. Bill Sevcik*
- 09:00 – 09:15 **Young, C:** Emergency department electrocardiogram interpretation: Clinical impact of misreads and variables influencing misreads
- 09:15 – 09:30 **Ali, S:** iPad distraction during intravenous cannulation in the pediatric emergency department: a randomized clinical trial
- 09:30 – 09:45 **Douma, M:** Describing out-of-hospital cardiac arrest to improve recognition: an analysis of online cardiac arrest videos
- 09:45 – 10:00 **Sivakumar, M:** Physicians' knowledge, attitudes, and practices regarding opioid use in the pediatric emergency department
- 10:00 – 10:15 **O'Brien, D:** Patient factors associated with being offered a take-home naloxone kit in the Royal Alexandra Hospital emergency department
- 10:15 – 10:30 **Resident Research Summaries**
- 10:30 – 10:50 *Refreshments and Coffee – Katz Lower Foyer*
View Posters
- 10:50 – 10:55 **Visiting Speaker Introduction – Dr. Brian Rowe**, Professor, Department of Emergency Medicine, University of Alberta. Tier I Canada Research Chair in Evidence-based Emergency Medicine
- 10:55 – 12:00 **Keynote Lecture – Dr. Aaron Orkin**, Clinical Public Health Fellow, DLSPH, University of Toronto. Researcher, Schwartz/Reisman Emergency Centre, Mount Sinai Hospital
- 12:00 – 13:00 *Complimentary Lunch – Katz Lower Foyer*
View Posters

Moderator: Dr. Christopher McCabe

- 13:00 – 13:15 **Picard, C:** A systematic review and meta-analysis of tourniquet devices for speed of application, successful hemostasis and patient tolerance
- 13:15 – 13:30 **Rajagopal, M:** An eight year review of pediatric injuries due to falls from windows and balconies
- 13:30 – 13:45 **Hill, N:** Conceptualizing ‘unnecessary care’ in emergency departments (ED): Qualitative interviews with ED physicians and site chiefs
- 13:45 – 14:00 **Klemmer, D:** Improving clinical outcomes by utilizing a nurse practitioner model in emergency department
- 14:00 – 14:15 **Ma, W:** A quality improvement project: Identifying and managing latent safety threats through a zone wide emergency department in-situ multiple discipline simulation program

- 14:15 – 14:30 *Refreshments and Coffee – Katz Lower Foyer*
View Posters

Moderator: Dr. Michael Bullard

- 14:30 – 14:45 **Smith, K:** Development of the inner city attitudinal assessment tool (ICAAT) for learners across health care professions
- 14:45 – 15:00 **Moghrabi, R:** Interventions aimed at improvement in emergency department related transitions in care for adult patients with atrial fibrillation and flutter: a systematic review
- 15:00 – 15:15 **Lam, N and Morch, K:** Implementing a procedural sedation checklist as a quality improvement initiative
- 15:15 – 15:30 **Dymond, M:** Insights from a tertiary care intraosseous insertion practice improvement registry: a two year descriptive analysis
- 15:30 – 15:45 **Resident Research Summaries**
- 15:45 – 16:15 **Awards and Closing Comments**

08:30 – 16:30 Poster display (Katz atrium)

Poster 1: Schonnop, R: Development, implementation and evaluation of a curriculum for healthcare students working at electronic dance music events

Poster 2: Pompa, N: A randomized crossover trial of conventional versus modified chest compressions in a height-restricted aeromedical helicopter

Poster 3: Zhuo, R: Identifying enteropathogens in children with acute gastroenteritis through enhanced detection: a prospective cohort study

Poster 4: O'Dochartaigh, D: Blood on board: the development of a prehospital blood transfusion program in a Canadian helicopter emergency medical service

Poster 5: O'Dochartaigh, D: A follow-up examination of prefilled “code cart” epinephrine syringes for direct administration of small doses using a syringe priming technique

Poster 6: O'Dochartaigh, D: Ultrasound guided peripheral intravenous access in the emergency department: a practice improvement registry

Poster 7: Holroyd, B: Content of clinical informatics in international training standards for emergency medicine specialists

Poster 8: Ma, W: Creating a successful emergency department based sustainable multidisciplinary simulation program across multiple sites

Poster 9: Douma, M: Proximal external aortic compression for life-threatening abdominal-pelvic and junctional hemorrhage: an ultrasonographic study in adult volunteers

Poster 10: Ali, S: Validation of the stoplight pain scale tool in the Canadian emergency setting

Poster 11: Colmers-Gray, I: The revised METRIQ score: an international usability analysis of a quality evaluation instrument for medical education blogs

Poster 12: Fletcher, C: Development and implementation of a workshop for advanced care planning and goals of care conversations in the emergency department

Poster 13: Hayward, J: Predictors of admission in unscheduled return visits to the emergency department

Visiting Speaker Lecture



Aaron Orkin MD, MSc, MPH, CCFP (EM), FRCPC

**Clinical Public Health Fellow, Dalla Lana School of Public Health, University of Toronto
Researcher, Schwartz/Reisman Emergency Medicine Institute, Sinai Health System
Emergency Physician, Schwartz/Reisman Emergency Centre, Mt. Sinai Hospital**

“The SOONER Project: Combining design, simulation, and trial methods to bring naloxone distribution into everyday practice”

Naloxone distribution might help to solve the opioid overdose crisis, but naloxone kits have not been designed for distribution in emergency departments or other clinical settings. The Surviving Opioid Overdose with Naloxone Education and Resuscitation (SOONER) Project combines design research and overdose simulation with a randomized trial to invent a new naloxone kit and evaluate its educational effectiveness. Dr. Orkin will explore the opioid crisis, the SOONER Project, and the opportunities for innovation and discovery when we blend design with health research.

**Tuesday, June 12, 2018 from 1100am to 1200pm
Allard Family Conference Room
1-080 Katz Building**

This visit has been funded in part by the Walter Mackenzie Visiting Speaker Fund

Abstracts

Oral Presentations

In order of presentation

EMERGENCY DEPARTMENT ELECTROCARDIOGRAM INTERPRETATION: CLINICAL IMPACT OF MISREADS AND VARIABLES INFLUENCING MISREADS

Young C, Norris C, Medves J, Rowe BH, Taylor D.

Departments of Medicine (Cardiology) and Emergency Medicine, University of Alberta, Edmonton, Alberta.

INTRODUCTION: Electrocardiograms (ECGs) are a common investigation in the emergency department (ED) and past studies have documented high proportions of discordance between ED physicians and final cardiologist interpretations. Despite this, few would have resulted in altered management and there are limited studies examining factors influencing misreads. The purpose of this study was to quantify the percentage of discordant abnormal ECG interpretations, and those that were clinically important, performed by ED physicians compared to cardiologists and to identify which factors predict discordance.

METHODS: Fourteen full time volunteer ED physicians at the University of Alberta Hospital participated. For each shift randomized during the study, the ED physician completed a standardized interpretation form that was entered into a RedCAP database. Cardiologists independently interpreted the same ECG at a later date without knowledge of the ED physician interpretation. Any interpretation identified as abnormal by the cardiologist was then compared with the interpretation by the ED physician, and discordance was noted. The abnormal ECGs were further stratified into clinically significant ECGs.

RESULTS: From all shifts, 223 ECGs were obtained. Discordance was identified in 2.7% for abnormal ECGs, and 1.8% were initially determined to be clinically important ECGs. Based on a chart review of the discordant ECGs, it was determined that the management would not have been changed in any. There were not enough discordant interpretations to analyze predictor variables.

CONCLUSION: Similar to more recent literature, this study indicated a very low proportion of discordance between ED physician and Cardiologist interpretation of ECG, and no clinically important ECG misreads. These results suggest there is limited value in funding cardiologists to re-interpret ECGs performed in the ED. In an era of scarce resources and elimination of unnecessary testing, the funds used for ECG over-reads could be reallocated to higher priority areas.

IPAD DISTRACTION DURING INTRAVENOUS CANNULATION IN THE PEDIATRIC EMERGENCY DEPARTMENT: A RANDOMIZED CLINICAL TRIAL

Ali S, Ma K, Dow N, Vandermeer B, Issawi A, Scott S, Beran T, Graham TAD, Curtis S, Jou H, Hartling H.

Department of Pediatrics, University of Alberta, Edmonton, Alberta.

INTRODUCTION: Intravenous (IV) cannulation is commonly performed in emergency departments (ED), causing substantial pain and distress. Distraction has been shown to reduce child-reported pain. Our primary objective was to compare the reduction of pain and distress using iPad distraction in addition to standard care, versus standard care alone.

METHODS: This randomized clinical trial, conducted at the Stollery Children's Hospital ED, recruited children between ages 6 to 11 years requiring IV cannulation. Pain, distress, and parental anxiety were measured using the Faces Pain Scale-Revised, the Observed Scale of Behavioral Distress-Revised, and the State Trait Anxiety Inventory, respectively.

RESULTS: 85 children were enrolled, with 42 receiving iPad distraction and 43 standard care, of which 40 (95%) and 35 (81%) children received topical anesthesia, respectively ($p=0.09$). There were 40 girls (47.1%) with a mean age of 8.32 +/- 1.61 years. The pain scores during IV cannulation ($p=0.35$) and the pre-post change in pain score ($p=0.79$) were not significantly different between the groups, nor were the observed distress scores during IV cannulation ($p=0.09$), or the pre-post change in observed distress ($p=0.44$). Children in both groups had greater total behavioral stress if it was their first ED visit ($p=0.01$), had prior hospitalization experience ($p=0.04$) or were admitted to hospital during this visit ($p=0.007$). A previous ED visit was predictive of a greater increase in parental anxiety from baseline ($p=0.02$). When parents were asked whether they would use the same methods to manage pain for their child, parents of the iPad group were more likely to say yes than were parents of the standard care group ($p=0.03$).

CONCLUSION: iPad distraction during IV cannulation was not found to decrease pain or distress more than standard care alone, but parents preferred its use. The effects of iPad distraction may have been over-shadowed by potent topical anesthetic effect.

DESCRIBING OUT-OF-HOSPITAL CARDIAC ARREST TO IMPROVE RECOGNITION: AN ANALYSIS OF ONLINE CARDIAC ARREST VIDEOS

Douma M¹, Picard C, Yun Z.

¹Royal Alexandra Hospital, Edmonton, Alberta.

¹University College Dublin, Ireland.

INTRODUCTION: In many communities, half of out-of-hospital cardiac arrests (OOHCA) go untreated prior to emergency personnel arrival. One barrier to bystander response is lack of recognition. This study's purpose is to describe OOHCA to improve recognition and encourage bystander response.

METHODS: Searching was performed from August 3rd to January 20th, 2018, on the 26 most popular and largest video-hosting and social media platforms. Cardiac arrest related search terms in English and Chinese were employed. The inclusion criteria were: i) videos be of medium to high definition ($\geq 360p$ and ≥ 10 frames per second), ii) cardiac arrest could be confirmed from two sources, iii) the reviewers reached agreement about the presence prodromal and post-arrest signs in the video, and iv) the arrest was non-traumatic in nature. Each platform was searched until 100 consecutive unrelated videos were returned.

RESULTS: Eight hundred and twenty-one videos were identified. One hundred and sixty-five videos met inclusion criteria and underwent content analysis. Before arrest, 68 (41%) of victims exhibited prodromal signs: 34 (21%) had unsteady gait; 42 (26%) touched their head or neck; and 33 (20%) hip-flexed or braced themselves on their thighs prior to collapse. After collapse, 97 (59%) victims exhibited post-collapse signs such as agonal breathing (71, 43%) or tonic posturing/convulsions (39, 24%). Lay-response fell into six categories: 38 (28%) victims were shaken, 28 (17%) received chest compression(s), 18 (11%) had their head held, 17 (10%) were unsuccessfully lifted to a standing position, 9 (5%) had their legs raised and 5 (3%) had an AED applied.

CONCLUSION: Many OOHCA resemble seizure and exhibit agonal breathing. Initial bystander response is often absent or is unlikely to be therapeutic. This information could be used to inform first aid education and improve cardiac arrest recognition.

PHYSICIANS' KNOWLEDGE, ATTITUDES, AND PRACTICES REGARDING OPIOID USE IN THE PEDIATRIC EMERGENCY DEPARTMENT

Fowler M, Ali S, Gouin S, Drendel A, Poonai N, Yaskina M, Sivakumar M¹, Jun E, Dong K.

¹Department of Pediatrics, University of Alberta, Edmonton, Alberta.

INTRODUCTION: Inadequate pain management in children is ubiquitous in the emergency department (ED). As the current national opioid crisis has highlighted, physicians are caught between balancing pain management and the unknown risk of long term opioid dependence. This study aimed to describe pediatric emergency physicians' (PEPs) willingness to prescribe opioids to children in the ED and at discharge.

METHODS: A unique survey tool was created using published methodology guidelines. Information regarding practices, knowledge, attitudes, perceived barriers, facilitators and demographics were collected. The survey was distributed to all physician members of Pediatric Emergency Research Canada (PERC), using a modified Dillman's Tailored Design method, from October to December 2017.

RESULTS: The response rate was 56% (136/242); 54% (60/111) were female, mean age was 43.5 years (+/- 8.7), and 54% (74/136) had pediatric emergency subspecialty training. For moderate and severe MSK-I, intranasal fentanyl was the most common opioid for first line pain management (34.6% (47/136) and 60.3% (82/136), respectively). 74% (91/123) of PEPs reported that an opioid protocol would be helpful, specifically for morphine, fentanyl, and hydromorphone. Using a 0-100 scale, physicians minimally worried about physical dependence (13.1 +/-19.1), addiction (16.3 +/-19.5), and diversion of opioids (33.3 +/-26.5) when prescribing short-term opioids. They reported that the current opioid crisis minimally influenced their willingness to prescribe opioids (29.1 +/-25.9). Physicians reported rarely/never (64%; 83/129) completing a screening risk assessment prior to prescribing opioids.

CONCLUSION: Intranasal fentanyl was the top opioid for all MSK-I pain intensities. PEPs are minimally concerned regarding opioid dependence, addiction, and the current opioid crisis when prescribing short-term opioids to children. There is an urgent need for robust evidence regarding dependence and addiction risk for children receiving short term opioids in order to create knowledge translation tools for ED physicians. Opioid specific protocols in the ED would likely improve physician comfort in responsible and adequate pain management for children.

PATIENT FACTORS ASSOCIATED WITH BEING OFFERED A TAKE-HOME NALOXONE KIT IN THE ROYAL ALEXANDRA HOSPITAL EMERGENCY DEPARTMENT

O'Brien D; Dabbs D, Dong K, Hyshka E.

Royal Alexandra Hospital, Edmonton Alberta.

INTRODUCTION: In 2016, Edmonton's Royal Alexandra Hospital implemented a Take-Home Naloxone (THN) program in the Emergency Department (ED) to provide THN access to individuals at risk of opioid poisoning. We sought to identify the extent to which THN is offered to patients who present to the ED with opioid poisoning, and whether patient-level factors are associated with being offered THN.

METHODS: We retrospectively reviewed charts from all ED visits for opioid poisoning between April 2016 and May 2017. Data on patient demographics, intoxicants, prescriptions, and clinical details were abstracted. Bivariate and multivariate analyses using generalized estimating equations with logit link were used to identify factors associated with being offered THN.

RESULTS: 299 unique individuals made 344 ED visits for opioid overdose during the study period, 2 of whom died in hospital. Among ED visits where the patient survived, THN was offered 49% of the time. Multivariate analysis showed that factors associated with being offered THN included male sex (Adjusted Odds Ratio (AOR) 1.86; 95% confidence interval 1.06, 3.28), low Glasgow Coma Scale score (3-8) (AOR 4.03; 95% CI 1.92, 8.48), and reporting an illegal opioid intoxicant (AOR 2.80; 95% confidence interval 1.31, 5.98). Patients were less likely to be offered THN if they were prescribed opioids (AOR 0.44; 95% CI 0.22, 0.85), or if they left the ED without approval (AOR 0.29; 95% CI 0.14, 0.59).

CONCLUSION: In this real-world evaluation of an ED-based THN program, half of patients visiting the ED for opioid poisoning were offered THN. Clinicians were more likely to offer THN to certain patients, including males, patients without an opioid prescription, and patients reporting an illegal opioid intoxicant, even after controlling for overdose severity and whether ED discharge was approved. Further efforts are needed to ensure THN is offered to all eligible patients at risk of opioid poisoning.

A SYSTEMATIC REVIEW AND META-ANALYSIS OF TOURNIQUET DEVICES FOR SPEED OF APPLICATION, SUCCESSFUL HEMOSTASIS AND PATIENT TOLERANCE.

Picard C¹ & Douma MJ

¹Misericordia Community Hospital Emergency Department, Edmonton, Alberta.

INTRODUCTION: To analyse published literature on commercial and improvised tourniquets, for the following outcomes: lower-extremity arterial hemostasis, application speed, and patient tolerance.

METHODS: Studies were limited to English. Non-human studies, case series, and intra-operative applications were excluded. A systematic review of MEDLINE, PubMed, Google Scholar, and the Cochrane Database from 1992 to Dec 2017 was performed. Article citations were also assessed.

RESULTS: Twenty-one studies were included in this analysis, testing 28 tourniquet devices. The most popular devices for arterial hemostasis were the Combat Application Tourniquet (662 applications), Special Operations Forces Tactical Tourniquet (307 applications), blood pressure cuff (80 applications), rubber tubing (58 applications) and the Emergency and Military Tourniquet (52 applications). The blood pressure cuff achieved the highest (weighted averages) rate of occlusion at 99% (95% CI 93 to 100) based on four studies of 80 applications. Followed by the Emergency and Military Tourniquet which achieved 83% (95% CI 72 to 93), based on three studies of 52 applications ($p < 0.01$). The fastest device to apply, taking 17 seconds (95% CI 11 to 23), was surgical tubing based on two studies totalling 30 applications. Next fastest was the blood pressure cuff, requiring 20 seconds (95% CI 18 to 22), based on two studies totalling 58 applications ($p = 0.08$). No single device could be the most tolerated, due to heterogeneity of outcomes and small samples.

CONCLUSION: This is the first study to aggregate tourniquet device evidence. An important finding is the lack of a standardized evaluation methodology for tourniquets. The quality of evidence is of very low quality due to the small sample sizes, lack of blinding, selective outcome reporting and inconsistency of results. Common medical equipment appears to outperform commercial tourniquets for arterial hemostasis and speed of application; however, they are some of the least studied tourniquet devices.

AN EIGHT YEAR REVIEW OF PEDIATRIC INJURIES DUE TO FALLS FROM WINDOWS AND BALCONIES

Rajagopal M, Kundra M, Craig W, Ali S, Mabood N, Rankin T, Dow N.

Department of Pediatrics, University of Alberta, Edmonton, Alberta.

INTRODUCTION: Unintentional falls from heights such as windows and balconies pose a serious health hazard to the pediatric population. There is currently limited Canadian data describing the epidemiology of, and circumstances surrounding such falls. This study aimed to describe the incidence, demographic patterns, injury patterns and risk factors associated with pediatric falls from windows and balconies.

METHODS: This study employed both retrospective medical record review and prospective data collection. Retrospectively, charts were reviewed from January 2009 to December 2014, and prospectively, consenting families were enrolled from February 2015 to February 2017. Children 0-17 years of age, who presented to the Stollery Children's Hospital Emergency Department (ED) due to a fall from a window or balcony were included.

RESULTS: A total of 102 children were included; 72/102 (70.6%) were enrolled retrospectively and 30/102 (29.4%) prospectively. The median age was 4.46 years (IQR 2.83-6.83) with 65/102 (67.7%) being male. 89/102 (87.2%) fall cases were from windows and 13/102 (12.8%) from balconies. The mean estimated height of fall was 4.36 meters (+/- 2.50) with (59/67) 88.1% of falls occurring at the child's own home. Out of the 26 prospectively enrolled children with window falls, 25 (96.2%) had screens, 5 (21.7%) had guards, and 7 (31.82%) had stops in place. 20/23 (90%) children were noted to have climbed on furniture or other objects, leading to the fall. 31/102 (30.4%) children were admitted, out of whom 15 (48.4%) required surgery. There were no fatalities.

CONCLUSION: The vast majority of fall cases occurred in children under the age of 5 years and from a window. This mechanism of injury is associated with high morbidity and need for surgical treatment. Installation of key safety features in windows and balconies, and legislation to mandate this, may help minimize pediatric fall-related injuries.

CONCEPTUALIZING ‘UNNECESSARY CARE’ IN EMERGENCY DEPARTMENTS (ED): QUALITATIVE INTERVIEWS WITH ED PHYSICIANS AND SITE CHIEFS

Hill N, Krebs L.D, Villa-Roel, C, Rowe, B.H.

Departments of Sociology and Emergency Medicine, University of Alberta, Edmonton, Alberta.

INTRODUCTION: “Unnecessary care” (UC) is an increasingly commonly used term in medicine. Previous survey research suggests that definitions of UC vary among and within groups. This research explores how emergency physicians and administrators understand the term “UC”.

METHODS: Site chiefs and emergency physicians in an Alberta region were recruited through email and online surveys respectively for a qualitative study. One hour one-on-one in-depth interviews explored understandings of unnecessary care within the emergency department (ED) context. Interview transcripts underwent thematic analysis.

RESULTS: Five physicians and seven site chiefs completed interviews. Two key themes emerged. First, interviewees conceptualized UC as inappropriate or non-urgent presentations. This patient-centric view raised non-urgent ED presentations as a health system problem with complex components, including: lack of public knowledge of healthcare resources, shrinking comfort and scope of community providers and patient willingness to utilize other resources. Despite concerns over non-urgent visits, interviewees expressed that these patients still need to be assessed/managed. The second conceptualization focused on over-investigation (and to lesser extent, treatment). This physician-centric conceptualization identified issues around: variation in physician risk tolerance, established decision rules with the allowable “miss rates”, patient expectation for testing or physician feeling that the patient was owed something or that patient would not accept their diagnosis/treatment without testing. Additionally, interviewees described patient characteristics that may initiate more aggressive investigation. An overarching concern about the connection between UC and wasted resources was identified. Additionally, interviewees emphasized that patient conversations are outside the scope of UC despite their possible implications for limited time resources.

CONCLUSION: A range of concepts surrounding UC in the ED were identified. Further exploring nuances of these conceptualizations may inform and improve the effectiveness of campaigns seeking to improve efficiency in practice and reduce inappropriate care. Additionally, this work provides an impetus for developing clearer concepts of care within the ED.

IMPROVED CLINICAL OUTCOMES BY UTILIZING A NURSE PRACTITIONER MODEL IN EMERGENCY DEPARTMENT

Grubb S, Klemmer D, Sharif N, Sookram S, Zibell C.

Strathcona Community Hospital, Sherwood Park, Alberta.

INTRODUCTION: Prior to opening Strathcona Community Hospital (STCH) site leadership were tasked to develop an innovative care model to improve patient safety and quality of care delivered in the emergency department (ED) utilizing a nurse practitioner (NP) model. They developed 3 pillars: collaboration, multidisciplinary approach, and improved patient satisfaction and ensuring no patient gets lost to follow up. NPs work in the STCH ED, NP Intravenous therapy (IVT) clinic, and the NP Emergency Department Transition (EDT) Clinic in Ambulatory Care. In the ED, NPs provide direct clinical care and indirect care -judicious review of DI and microbiology reports and care coordination for patients at risk of returning to the ED or those who would otherwise get lost to follow up. The EDT clinic is an innovative NP lead clinic with the purpose of providing timely, high-quality follow up care for patients in seen previously in the ED.

METHODS: Data for the service delivery indicators came from data repository and manual data collection looking at these outcomes: timely DI/microbiology results review in ED; free up physician time for direct care; decreased ED visits for non-urgent issues; safe transitions in care and improved patient satisfaction with ED care. Quantitative data from service delivery, patient and staff surveys were analyzed using Microsoft Excel and SPSS 19.

RESULTS: From June 2016 to January 2017 ED NPs at STCH: reviewed 3000 positive microbiology reports, made 517 f/u calls to patients regarding these results, and reviewed 3181 DI results (freeing up approximately 2hrs/day of ED physician time. ED hours with NP coverage have decreased the number of patients who left without treatment (LWT) by approximately 50%, and improved STCH ED wait times to be among the lowest in the Edmonton Zone. IVT NPs monitored 5000+ patient visits. EDT NPs completed 837 patient visits; 371 letters to family physicians (FPs); 215 referrals; and connected 520 patients to a new FP. Patient satisfaction surveys show 88-90% of the patients were satisfied with their care.

CONCLUSION: NPs are integral members of the provider team at STCH, providing direct clinical care and several valuable follow up services for ED patients. The EDT clinic provides urgent follow up for ED patients unable to get a timely appointment with their FP or no access to FP, prevents unnecessary returns to ED, and aids to bridge ED services to FPs or specialists. NPs are the common thread through all departments within the innovative model at STCH, contributing to quality patient care and high patient satisfaction.

A QUALITY IMPROVEMENT PROJECT: IDENTIFYING AND MANAGING LATENT SAFETY THREATS THROUGH A ZONE WIDE EMERGENCY DEPARTMENT IN-SITU MULTIDISCIPLINE SIMULATION PROGRAM

Ma W, Mews L, Chan M, Brown T, O'Dochartaigh D.

Alberta Health Services, University of Alberta, Edmonton, Alberta.

INTRODUCTION: High fidelity, multidisciplinary, in-situ simulation can detect latent safety threats (LST) such as system deficiencies, equipment failures, or conditions predisposing to medical errors. Not well reported is whether these LST are effectively managed. Emergency departments (ED) in the Edmonton zone conducted simulations as part of a quality improvement project to identify LST and subsequently manage them.

METHODS: In 2017, 18 simulation sessions were conducted. Following each, a cross sectional survey based assessment tool was completed by participants to identify LST. Findings were shared with site clinical nurse educators and managers, and a mitigation plan made. Follow-up occurred to track progress. For reporting, LST were grouped into themes and progress coded as either resolved, ongoing, or not managed.

RESULTS: A total 162 LST were identified. The most commonly identified were: lack of staff training (34), resuscitation resource required (n 29), equipment not immediately available (28), medication not immediately available (14), medication needed (14), medication resource required (13), IT resource required (8), staff requiring familiarization (9), IT issue (5), small equipment needed (5), lack of staff resource (5), large equipment needed (4), equipment malfunction (3), environment cluttered (3), non-appropriate resource removed (2). Site follow-up identified a total of 75 LST that were resolved and 87 that required ongoing work to manage. No occurrences of not managed LST were identified.

CONCLUSION: Simulation effectively identified LST, which appeared common in all EDs studied. Creating a structured plan and follow up resolved many LST and all to be effectively managed. In 2018 simulation will reassess if LST remain. Additionally zone learnings will be shared provincially to assess if similar threats exist in EDs across the province.

DEVELOPMENT OF THE INNER CITY ATTITUDINAL ASSESSMENT TOOL (ICAAT) FOR LEARNERS ACROSS HEALTH CARE PROFESSIONS

McKinney M, Smith KE¹, Dong KA, Babenko O, Ross S, Kelly MA, Salvalaggio G,

¹University of Alberta, Edmonton, Alberta.

INTRODUCTION: Many health care learners feel uncomfortable and underprepared for professional interactions with inner city populations, and may hold biases which affect the therapeutic relationship. Targeted educational programs in inner city health play a role in improving learner attitudes and future provision of health care; however, few tools exist to evaluate attitudinal competencies within these programs.

METHODS: Tool development consisted of four phases: 1) Item identification and generation informed by a scoping review of the literature; 2) Item refinement involving a two stage modified Delphi process with a national multidisciplinary team (n=8), followed by evaluation of readability and face validity with a focus group of medical and nursing students (n=13); 3) Pilot testing with a larger cohort of medical and nursing students, evaluating potential response bias with the Marlowe-Crown social desirability scale; and 4) Analysis of psychometric properties through factor analysis and internal reliability with medical and nursing students.

RESULTS: 214 of 1452 undergraduate students (67.7% from medicine and 32.3% from nursing) completed a 36-item online version of the Inner City Attitudinal Assessment Tool (ICAAT), with a response rate of 15%. The emerging tool consists of 24 items, within a three-factor model – affective, behavioural, and cognitive. Reliability values using Cronbach alpha were 0.87, 0.82, and 0.82 respectively. The reliability of the whole 24-item ICAAT was 0.90.

CONCLUSION: The Inner City Attitudinal Assessment Tool (ICAAT) is a novel tool with evidence to support its use in assessing health care learners' attitudes towards caring for inner city populations. This tool has the potential to help guide curricula in inner city health.

INTERVENTIONS AIMED AT IMPROVEMENT IN EMERGENCY DEPARTMENT RELATED TRANSITIONS IN CARE FOR ADULT PATIENTS WITH ATRIAL FIBRILLATION AND FLUTTER: A SYSTEMATIC REVIEW.

Gilbertson J, Moghrabi R, Kirkland SW, Tate K, Sevcik W, Lam NT, Rowe BH, Villa-Roel C

Departments of Emergency Medicine and Pediatrics, and Faculty of Nursing, University of Alberta, Edmonton, Alberta.

INTRODUCTION: Transitions in care (TiC) interventions have been proposed to improve outcomes for patients in emergency departments (ED). The objective of this review was to examine the effectiveness of TiC interventions to improve outcomes for adult patients presenting to ED with acute atrial fibrillation or flutter (AFF).

METHODS: A comprehensive search of eight databases and grey literature sources was conducted to identify comparative studies assessing the effectiveness of interventions to improve TiC for patients presenting to ED with acute AFF. Two independent reviewers completed study selection, quality/fidelity assessment, and data extraction. Relative risks (RR) with 95% confidence intervals (CIs) were calculated using a random effects model. and heterogeneity was reported among studies using I-square (I^2) statistics.

RESULTS: From 744 citations, seven studies were included. Study quality ranged from unclear to low for the three RCTs, moderate in three before-after (B/A) studies, and high in the cohort study. Most interventions were set within-ED ($n=5$), including clinical pathways and ED observation units. Post-ED interventions ($n=2$) included patient education and general practitioner referral. Three studies reported a significant decrease in overall hospital length of stay for AFF patients undergoing TiC interventions, however, incomplete outcome reporting precluded meta-analysis. An increased conversion to normal sinus rhythm was reported among patients receiving TiC interventions, this may be related to increased use of electrical cardioversion within the RCTs (RR=2.16; 95% CI: 1.42, 3.30), B/A studies (RR=2.69, 95% CI: 2.17, 3.33), and cohort study (RR=1.39; 95% CI: 1.24, 1.56).

CONCLUSION: Within-ED TiC interventions may reduce hospital LoS and increase use of electrical cardioversion. However, no clear recommendations can be generated from this systematic review and more efforts are required to improve TiC for patients presenting to ED with AFF.

IMPLEMENTING A PROCEDURAL SEDATION CHECKLIST AS A QUALITY IMPROVEMENT INITIATIVE

Colmers-Gray I¹, Lam N¹, Mallia A¹, Morch K¹, Schonnop R¹, Skoblenick K¹, Desrochers C, Hayward J, Hegstrom A, Chang E, Hanson A.

¹Department of Emergency Medicine, University of Alberta, Edmonton, Alberta.

INTRODUCTION: Procedural sedations are a common procedure in the emergency department (ED). Though frequently performed, sedations carry a potential risk of harm. Surgeons and anesthesiologists have implemented pre-procedure time-outs with checklists prior to commencing an operation, in attempts to mitigate procedure-related risks. Our quality improvement (QI) initiative sought to implement a similar checklist for procedural sedations performed in the ED.

METHODS: A one-page procedural sedation checklist was developed based on a literature review and in consultation with relevant health professionals (respiratory therapists [RTs], MDs). The checklist was completed by RTs at the Royal Alexandra Hospital ED over a two-month period. Completed checklists were collected anonymously. Data was summarized for further review, revision, and possible re-implementation of this QI initiative.

RESULTS: 108 checklists were completed during the QI period. Checklist section completions rates were 96% for pre-sedation preparation, 99% for equipment, and 85% for the MD timeout. Missing equipment was identified in 13% of checklists. One case identified a number of potential hazards before initiating procedural sedation. Overall satisfaction for the checklist was 66% for physicians, 59% for RTs and 55% for nurses. Feedback was provided on 52% of checklists. Overall satisfaction for the checklist was variable, though participants found it user friendly.

CONCLUSION: Implementation of a multidisciplinary procedural sedation checklist over a two-month period was well completed and helped identify missing equipment prior to sedation. The checklist allowed critical preparatory components of procedural sedation to be verbalized. Future areas of research include improving the checklist based on feedback received, and incorporating the checklist within established ED protocols

INSIGHTS FROM A TERTIARY CARE INTRAOSSEOUS INSERTION PRACTICE IMPROVEMENT REGISTRY: A TWO-YEAR DESCRIPTIVE ANALYSIS

Dymond, M., O'Dochartaigh, D, Douma, M.

Alberta Health Services, Edmonton, Alberta.

INTRODUCTION: Resuscitation guidelines suggest initiating intraosseous access when intravenous access is not readily attainable. Few practice improvement registries exist describing patient and clinician factors associated with intraosseous insertion. This study reports on the creation of an emergency nurse-educator lead registry that tracked intraosseous insertions so successes, failures, and adherence to standards could be assessed.

METHODS: Emergency nurses assigned to resuscitation areas of the tertiary emergency department completed an education module on intraosseous insertion and maintenance. A tracking form was completed whenever intraosseous access was attempted. The emergency department clinical nurse educator collected and collated the tracking forms. A second researcher checked data abstraction accuracy.

RESULTS: Over two years, 17 pediatric patients (receiving 23 intraosseous insertions) and 35 adult patients (receiving 40 intraosseous insertions) had forms returned. Prior to an intraosseous attempt, the average number of intravenous attempts for pediatric and adult patients were 4 [range 0-10], and 2 [range 0-5] respectively. Successful pediatric intraosseous insertion rate was 6/15 (40%) for physicians, and 6/7 (86%) for emergency nurses. The leading cause of failed insertions was selecting a needle that was too short, either not reaching the intramedullary canal or quickly becoming dislodged. For adult patients intraosseous insertion success rates for physicians were 13/14 (93%) and 18/20 (90%) for emergency nurses. Data was not gathered on specific physician level of training (i.e. residents or attending physicians), though this was added for ongoing data collection. The most common destination for all patients were critical care units.

CONCLUSION: Despite standard limitations of self-reported registry data, the implementation of an intraosseous registry identified opportunities to improve clinical practice through continued educational programming focused on the clinical threshold for intraosseous use in pediatric patients and the appropriate selection of intraosseous cannula.

Poster Presentations

DEVELOPMENT, IMPLEMENTATION AND EVALUATION OF A CURRICULUM FOR HEALTHCARE STUDENTS WORKING AT ELECTRONIC DANCE MUSIC EVENTS

R. Schonnop & D. Ha

University of Alberta, Department of Emergency Medicine, Edmonton, AB

INTRODUCTION: Mass Gathering Medicine (MGM) is a growing field within emergency medicine (EM) and providing care at electronic dance music events (EDMEs) is an increasingly popular activity with MGM groups. Often, health care students are allowed to participate. However, there is a lack of documented curricula to train junior learners in providing medical care at these events. To address this, we developed and initiated an interprofessional, simulation-based workshop for University of Alberta health care students interested in working at EDMEs.

METHODS: We used Kerns' six-step approach to develop the workshops. Our MGM Interest Group identified a need for educational sessions in toxicology case management at EDMEs. A subsequent literature review revealed a paucity of pre-existing curricula on this topic for MGM learners. We created goals and objectives for the workshops, reflecting the knowledge, skills and attitudinal competencies required to provide appropriate medical care at these events. The workshops were implemented and evaluated in November 2016 and 2017.

RESULTS: A total of 44 medical and nursing students attended the workshops. An EM resident and staff physician, both with prior experience working at EDMEs, led each session. Each workshop began with a short didactic lecture followed by two hours of case-based training using two standardized patients and a high fidelity simulator. Topics were chosen based on previously published articles describing medical cases seen at EDMEs. The simulation replicated the actual space, noise and equipment available at the medical tents at these events. Two interprofessional learner groups took turns managing a different set of 3 patients: Set 1-opioid overdose (OD), alcohol/vomiting, sympathomimetic OD; Set 2-opioid OD not responsive to naloxone, anticholinergic/seizure, OD with hyperthermia. Initial assessment, medical management and team communication skills were emphasized. Debriefing was provided to learners immediately after each set of cases. After each workshop, the learners completed evaluation forms utilizing both Likert scale and open-ended responses. Overall, students were extremely complimentary about the workshop structure, content and communication skills teaching. They were especially appreciative of the opportunity to participate in their first interprofessional team experience.

CONCLUSION: To address local needs, a well-received simulation-based workshop was created to train students in toxicology case management at EDMEs. Future work will include using this workshop in a "just-in-time" fashion before upcoming

EDMEs and documenting students' actual use of skills taught (Kirkpatrick level 3). The workshop will also be further modified to implement more detailed interprofessional objectives and can provide a venue for EM residents to practice teaching interprofessional education competencies as part of their CanMEDS Scholar role.

A RANDOMIZED CROSSOVER TRIAL OF CONVENTIONAL VERSUS MODIFIED CHEST COMPRESSIONS IN A HEIGHT-RESTRICTED AEROMEDICAL HELICOPTER

Pompa N¹, O'Dochartaigh D², Mackenzie M², Douma MJ².

¹Department of Emergency Medicine, University of Alberta, Edmonton, Alberta.

²Alberta Health Services, Edmonton, Alberta.

INTRODUCTION: Aircraft are used world-wide to transfer patients to definitive care. Low ceiling height can negatively affect chest compression (CC) performance. This study compares CC techniques in a height-restricted aeromedical helicopter.

METHODS: Eighteen clinicians were randomized to two minutes of conventional or modified CCs, then crossed-over. An Airbus BK117 helicopter with 56cm of space between the manikin and ceiling was used. The modified technique used a forearm/elbow instead of overlapping hands. CC quality was assessed with a SkillReporting Laerdal Resusci-Anne manikin. Quality variables were: the number of CC, CC rate, depth and stroke length, release, land marking, and overall quality score. Participant feedback was collected using the Borg Scale of Perceived Exertion, and CC difficulty using a zero-to-ten scale. Furthermore, we solicited open-ended descriptive written responses as well. A sample size calculation using pilot data indicated 16 participants would be required.

RESULTS: The mean stroke length was 43mm for conventional CC versus 49mm using the modified method ($p < 0.05$). The average overall quality score was 63% for conventional CCs versus 79% for the modified CCs ($p = 0.04$). On average, the modified CC method increased compression depth by 5mm (95% CI 4.3 to 5.7), the proportion of compressions at the correct depth by 17% (95% CI 7.55 to 26.45) and improved the overall quality score by 6% (95% CI 2.02 to 9.98). The modified method resulted in statistically significant reductions in physical exertion and difficulty ($p < 0.001$). Qualitative feedback described modified CCs as easier and more sustainable.

CONCLUSION: In a height-restricted aeromedical helicopter, CC stroke length and overall quality is improved using the modified method. In settings where the compressor is affected by reduced overhead working height, the modified method of CC may be an advisable alternative.

IDENTIFYING ENTEROPATHOGENS IN CHILDREN WITH ACUTE GASTROENTERITIS THROUGH ENHANCED DETECTION: A PROSPECTIVE COHORT STUDY

Ran Zhuo¹, Brendon D Parsons¹, Bonita E Lee², Linda Chui^{1,3}, Stephen B Freedman⁴, Samina Ali⁵, Karen Lowerison⁶, Xiao-Li Pang^{1,3} on behalf of the APPETITE Team

¹Department of Laboratory Medicine and Pathology, University of Alberta, Edmonton, Alberta.

²Department of Pediatrics, University of Alberta, Edmonton, Alberta.

³Provincial Laboratory for Public Health (ProvLab, Alberta Health Services), Edmonton, Alberta.

⁴Sections of Pediatric Emergency Medicine and Gastroenterology, Alberta Children's Hospital and Alberta Children's Hospital Research Institute, University of Calgary, Calgary, Alberta.

⁵Department of Pediatrics, Faculty of Medicine & Dentistry, Women and Children's Health Research Institute, University of Alberta, Edmonton, Alberta.

⁶Cumming School of Medicine, University of Calgary, Calgary, Alberta.

INTRODUCTION: Acute gastroenteritis (AGE) is a common childhood infection. While nearly 2 million children are brought to emergency department (ED) annually in the US due to vomiting and/or diarrhea, it is estimated that it represents just 10% of affected individuals. Moreover, because collection of stool is burdensome and cannot be performed in patients with isolated vomiting, sample submission rates are low. Therefore, current pathogen-specific disease burden of AGE is likely underestimated. The Alberta Provincial Pediatric Enteric Infection Team (APPETITE) study is a prospective province-wide study capable of estimating the relative distribution of enteropathogens causing diarrhea and/or vomiting in Albertan children.

METHODS: Children less than 18 years of age with AGE and asymptomatic controls were recruited through two pediatric EDs, a telephone health advice service: Health Link Alberta (HLA) and a public health clinic. Rectal swabs and stool samples were collected and tested for 5 viruses, 9 bacteria and 3 parasites using enteric bacteria culture assays, an in-house gastroenteritis virus panel RT-qPCR and the commercially available Luminex xTAG Gastroenteritis Pathogen Panel.

RESULTS: From Dec 2014 to Jan 2018, 2,427 children with AGE were enrolled at the two EDs; 647 sick children were enrolled via HLA and 1,434 children were enrolled as asymptomatic controls. 72.9% (n=2,199) of the 3,018 symptomatic patients tested positive for ≥ 1 enteropathogen. Norovirus was the most commonly detected pathogen (n=807, 26.7%), followed by adenovirus (n=563, 18.7%) and rotavirus (n=507, 16.8%). *Clostridium difficile* was detected in 14.4% (n=436) of symptomatic children and in 11.6% (n=166) of the control individuals. Sapovirus (n=297, 9.8%) and astrovirus (n=106, 3.5%) were less prevalent. Excluding *C. difficile*, 5.9% (n=176) patients were infected by a bacterial pathogen and 0.5% (n=16) by a parasitic pathogen. Although 38% (n=547) of the 1,434 asymptomatic children tested positive for ≥ 1 pathogen, 11.2% (n=161) tested positive for rotavirus shortly following rotavirus vaccine administration.

CONCLUSIONS: This study allows us to understand the relative proportional etiologies of enteropathogens in children with AGE.

BLOOD ON BOARD: THE DEVELOPMENT OF A PREHOSPITAL BLOOD TRANSFUSION PROGRAM IN A CANADIAN HELICOPTER EMERGENCY MEDICAL SERVICE

Krook C, O'Dochartaigh D, McKay D, vanWerkhoven G, Painter S, Piggott Z, Deedo R, Nesyoly D, Armstrong JN, Martin D.

Shock Trauma Air Rescue Society; Alberta Health Services, Edmonton, Alberta.

INTRODUCTION: Prehospital blood transfusion has been adopted by many civilian HEMS agencies and early outcomes are positive. Shock Trauma Air Rescue Society operates in Western Canada and started a blood on board process in 2013 in Regina that has expanded to all bases. Two units of O negative packed red blood cells are carried on every mission. We describe the processes and standard work ensuring safe storage, administration, and stewardship of this important resource.

METHODS: The packed red blood cells are stored in an inexpensive, reusable temperature controlled cooler at 1 - 6°C. Close collaboration with local transfusion services and adherence to Canadian transfusion standards contributes to safety and sustainability.

RESULTS: From October 1st 2013 to October 10th 2017 the Shock Trauma Air Rescue Society administered blood to 431 patients. Blood on board was utilized in 62.9% of cases. A total of 463 blood box units were administered and the majority of patients (69.0%) received both units. The majority of patients were male (68.2%). Trauma was the most common diagnosis (74.1%). The median age was 44 years old with 32 (11.7%) pediatric patients (age less than eighteen). Of all patients, 241 (88.0%) survived to hospital arrival. There was variation in frequency of blood box use between bases from 1.8 uses per 100 patients transported (Regina, Saskatchewan) to 7.0 uses per 100 patients (Winnipeg, Manitoba). Blood used in Calgary, Alberta was 100% traceable and only 0.97% of total units dispensed were wasted. All wasted units were due to temperature out of range and all events occurred within the first year. The vast majority of unused units were returned to circulation.

CONCLUSION: We describe the process to set up and monitor a prehospital blood transfusion program. Our standard work and stewardship processes minimize wastage of blood while keeping it readily available for our critically ill and injured patients.

A FOLLOW-UP EXAMINATION OF PREFILLED “CODE CART” EPINEPHRINE SYRINGES FOR DIRECT ADMINISTRATION OF SMALL DOSES USING A SYRINGE PRIMING TECHNIQUE

O’Dochartaigh D, Brindley P, Douma MJ

Alberta Health Services, Edmonton, Alberta.

INTRODUCTION: The use of prefilled syringes to administer epinephrine is common. While vigorously supported by the manufacturer, the accuracy of delivering small doses of epinephrine from 10 ml prefilled syringes has been questioned, particularly when delivering lower volumes (0.5 to 3 millilitres (ml)). We performed an in-vitro simulation trial, to assess the actual versus assumed volume of prefilled epinephrine syringes to deliver volumes of 0.5 to 3 ml.

METHODS: We examined prefilled epinephrine syringes containing 100ug/ml or 1mg in 10ml. Our goal was to determine expelled volume when the plunger was depressed to target doses/volumes: 50ug/0.5ml, 100ug/1ml, 150ug/1.5ml, 200ug/2ml, and 300ug/3ml. Also total prefilled syringe volume was assessed. For each trial the participant performed a technique of syringe priming and delivery of the desired dose that mirrored everyday clinical practice. Participants were blinded to their results and two researches confirmed delivered volumes. To assess the accuracy of smaller syringes, tests were repeated with a 1ml and 3 ml syringe to first transfer the desired dose into.

RESULTS: The mean total volume of 10 prefilled syringes was 10.8mL (95% CI 10.66-10.94). We conducted 193 separate tests with the preload syringe and 152 separate tests with the 1ml and 3 ml syringes. For the preload syringe, for all target volumes the mean volume delivered was within 2% of the target and 95% were 3%. However, minimum and maximum results deviated greatest for the 0.5ml and 1ml target volumes (up to 24% and 13% respectively). For the 1ml and 3 ml syringes tests, results were similar between syringe sizes. The mean volume delivered and the 95% were within 1% of all target volumes. Minimum and maximum tests deviated no more than 6% for the 0.5ml volume and between 1.3% and 3% for all other target volumes

CONCLUSIONS: To increase accuracy, the volume of a prefilled syringe should be zeroed prior to administration. For administering smaller volumes, and especially volumes less than one ml, a smaller syringe should be considered.

ULTRASOUND GUIDED PERIPHERAL INTRAVENOUS ACCESS IN THE EMERGENCY DEPARTMENT: A PRACTICE IMPROVEMENT REGISTRY

O'Dochartaigh D, Douma MJ

Alberta Health Services Edmonton, Alberta.

INTRODUCTION: Ultrasound-guided peripheral intravenous catheter (UGIVC) placement fills a gap in patient care: when peripheral IV access is assessed to be difficult with traditional access methods of vein visualization and palpation, and intraosseous and central venous access are not indicated. There is high quality evidence to support UGIVC placement by nurses. At the University of Alberta emergency department (ED) a standardized specialized clinical competency was created which included didactic learning, in person simulation, and three successful mentored starts. Data was then collected after UGIVC attempts to monitor the implementation of the program and assess for quality improvement opportunities.

METHODS: Emergency nurses and paramedics that had completed the training were asked to complete a tracking form whenever an UGIVC was attempted. An ED paramedic entered the tracking forms into a database and a researcher checked data abstraction accuracy.

RESULTS: Over ten months of data collection 12 pediatric patients and 55 adult patients had forms returned. Prior to an UGIVC the average number of intravenous attempts for all patients were 4.1 [range 0-12]. The overall successful insertion rate was 62/67 (93%). First attempt success was 47/67 (70%) second attempt 17/67 (24%), and third attempt 3/67 (4%). Failure to gain UGIVC access occurred in 5/67 (7%) of cases. Complications were 6/67 (9%) and reported as “insertion not successful” (n 4) and “patient movement caused line to be lost” (n 2). Challenges or opportunities to improve practice were reported under three areas: technique (such as improve tip tracking to avoid back walling, improve patient positing, or use an extra person to assist); patient factors (challenging site selection such as vein close to artery, at a difficult angle, loose skin requiring traction and even probe pressure, or patient cooperation); and equipment (needed a longer IV catheter, pushed button on IV catheter accidentally)

CONCLUSION: There are ongoing educational opportunities to improve UGIVC placement first attempt success. However the high reported success rate and low reported complication rate supports the ongoing use and tracking of this procedure.

CONTENT OF CLINICAL INFORMATICS IN INTERNATIONAL TRAINING STANDARDS FOR EMERGENCY MEDICINE SPECIALISTS

Holroyd B¹, Beeson MS², Hughes T³, Kurland L⁴, Sherbino J⁵, Truesdale M⁶, Hersh W⁷

¹Department of Emergency Medicine, University of Alberta

²Department of Emergency Medicine, Northeast Ohio Medical University, Cleveland OH, USA

³Emergency Medicine, Oxford Radcliffe Hospitals NHS Trust, Oxford, UK

⁴Department of Medical Sciences, Örebro University, Sweden

⁵McMaster University, Hamilton ON

⁶Professor of Emergency Medicine, University of Melbourne, Melbourne, Australia

⁷Department of Medical Informatics & Clinical Epidemiology, Oregon Health & Science University, Portland OR, USA

INTRODUCTION: The field of Clinical Informatics (CI) and specifically the electronic health record, has been identified as a key facilitator to achieve a sustainable evidence-based healthcare system for the future. International graduate medical education programs have been challenged to ensure their trainees are provided with appropriate skills to deliver effective and efficient healthcare in an evolving environment. This study explored how international Emergency Medicine (EM) specialist training standards address training in relevant areas of CI.

METHODS: A list of categories of CI competencies relative to EM was developed following a thematic review of published references documenting CI curriculum and competencies. Publicly available, published documents outlining core content, curriculum and competencies from international organizations responsible for specialty graduate medical education and/or credentialing in EM for the United States, Canada, Australasia, the United Kingdom and Europe. These EM training standards were reviewed to identify inclusion of topics related to the relevant categories of CI competencies.

RESULTS: A total of 23 EM curriculum documents were included in the thematic analysis. Curricula content related to critical appraisal/evidence-based medicine, leadership, quality improvement and privacy/security were included in all EM curricula. The CI topics related to fundamental computer skills, computerized provider order entry and patient-centered informatics were only included in the EM curricula documents for the United States and were absent for each other organization.

CONCLUSION: There is variation in the CI related content of the international EM specialty training standards which were reviewed. Given the increasing importance of CI in the future delivery of healthcare, organizations responsible for training and credentialing specialist emergency physicians must ensure their training standards incorporate relevant CI content, thus ensuring their trainees gain competence in essential aspects of CI.

CREATING A SUCCESSFUL EMERGENCY DEPARTMENT BASED SUSTAINABLE MULTIDISCIPLINARY SIMULATION PROGRAM ACROSS MULTIPLE SITES

Ma W, O'Dochartaigh, Mews L, Chan M, Brown T,

Alberta Health Services, Edmonton, Alberta.

INTRODUCTION: Multi-disciplinary, high fidelity, in-situ simulation can create a realistic teaching environment that supports knowledge acquisition, improves procedural skills, and enhances team communication. For ongoing quality improvement, simulations were conducted across 11 emergency departments (ED) in the Edmonton zone.

METHODS: In 2017, simulation sessions provided were doubled compared to 2016. Site needs assessment surveys were completed and cases created to address need. Two separate half day adult and pediatric sessions were provided at each site, with three separate cases and debrief between each. Facilitators included a nurse educator or specialist, an emergency physician (adult or pediatric specialist), and simulation technician. Following each simulation, a cross sectional, survey based assessment tool, was given to each participant.

RESULTS: Pediatric and adult simulation attendance was 130 and 104 respectively. Clinical discipline attendance was: RN 107 (45.7%), MD 64 (27.4%) EMS 2 (0.9%), student RN 5 (2.1%), RT 14 (6%), not specified 21 (9%), observer 13 (5.6%), CNE 4 (1.7%), LPN/Ortho tech 2 (0.9%), military med tech 1 (0.4%), Pharmacist 1 (0.4%). Overall mean results of feedback for Likert scale questions (1 strongly disagree to 5 strongly agree) were: 'scenario represented real life' 4.6; "The crisis resource management experience will be helpful" 4.5; "The knowledge gained will be helpful" 4.6; "learning environment was safe" 4.7; "able to suspend disbelief" 4.2; "The debrief discussion was useful"; 4.7; "It achieved the learning objective" 4.6.

CONCLUSION: Simulation sessions were well attended and received in our zone. 2018 plans include 50% more sessions, and continuing to focus on individual site clinical needs.

PROXIMAL EXTERNAL AORTIC COMPRESSION FOR LIFE-THREATENING ABDOMINAL-PELVIC AND JUNCTIONAL HEMORRHAGE: AN ULTRASONOGRAPHIC STUDY IN ADULT VOLUNTEERS.

Douma MJ¹, O'Dochartaigh D, Picard C, Brindley P.

¹Royal Alexandra Hospital

¹University College Dublin

INTRODUCTION: Following life-threatening abdominal-pelvic (and junctional) penetrating trauma, the goal is to limit blood-loss while expediting operative rescue. Unfortunately, junctional hemorrhage is often not amenable to direct compression and few temporizing strategies are available beyond dressings, hypotensive resuscitation, and transfusion.

METHODS: A convenience sample of six pairs of male paramedic volunteers were recruited from a trauma life-support course. Inclusion criteria were: age under 26 and in good physical health. Strict exclusion criteria were used to ensure minimal risk of atherosclerotic plaque detachment. In six randomized pairs, participants alternated learning and performing the maneuver on each other. Blood-flow was measured in recipients before, during and after compression by pulse wave Doppler ultrasound. Compression was maintained until i) blood flow was arrested for ten seconds, or ii) thirty seconds elapsed. The primary outcome was cessation of femoral arterial blood-flow as assessed by pulse wave Doppler ultrasound at the right femoral artery. Secondary outcomes were maximum discomfort using a visual analog scale (VAS) and negative sequelae within seven days of participation.

RESULTS: Aortic blood flow was arrested in 12 volunteers. Mean time to cessation was 14 seconds. Mean discomfort was five out of ten. No complications or negative sequelae were reported. Aortic blood flow was arrested in all 12 volunteers. Mean time to blood flow cessation was 14 seconds on average (range nine to 19 seconds). Mean discomfort was five out of ten, (range four to seven). No complications were reported at the 15 minute, 24-hour and 168-hour reassessments.

CONCLUSION: Despite noteworthy limitations, our data suggests it is reasonable to attempt to temporize major abdominal-pelvic and junctional haemorrhage using bimanual PEAC. In the absence of immediate alternatives there appear to be few downsides to pre-hospital PEAC, and while concomitantly expediting definite care.

VALIDATION OF THE STOPLIGHT PAIN SCALE TOOL IN THE CANADIAN EMERGENCY SETTING

Ali S, Shwetz S, Morrison E, Drendel AL, Rajagopal M, Yaskina M, Estey A.

Department of Pediatrics, University of Alberta, Edmonton, Alberta

INTRODUCTION: A variety of pain assessment tools exist for children, however none of the current scales were created specifically for family use. Further, none provide direct guidance with regards to pain treatment threshold. This study aimed to validate a novel, three faced, coloured coded, family-friendly pain tool, the Stoplight Pain Scale.

METHODS: A prospective observational cohort study was conducted at the Stollery Children's Hospital emergency department (ED) from November 2014 to February 2017. Patients (3-12 years) and their caregivers were asked to rate their pain using the novel Stoplight Pain Scale as well as the Faces Pain Scale-Revised (FPS-R). Pain was measured at presentation to the ED, immediately following painful procedures, and thirty minutes after analgesia administration.

RESULTS: A purposeful random sample of 227 patients were included; 61/227 (26.9%) of patients were 3-5 years old and 166/227 (73.1%) were 6-12 years old. Correlation between the two pain scales was consistently 'fair' to 'moderate'; using Kappa Statistics, a baseline correlation for Stoplight and FPS-R was 'fair' for both caregivers (0.38, 95% CI 0.28 – 0.48) and patients (0.36 95% CI 0.27-0.45). The Stoplight Pain Scale had 'fair to moderate' correlation between caregiver and patient scores, (0.37, 95% CI 0.27-0.47), compared to FPS-R which showed 'poor to fair' agreement between caregiver and child scores (0.20, 95% CI 0.12-0.29). Regardless of age or hospitalization status, 64% of patients (139/218) and 54% caregivers (118/220) preferred the Stoplight Pain scale ($p=0.001$).

CONCLUSION: The Stoplight Pain Scale correlates moderately well with FPS-R, a validated pain assessment tool for children and shows good correlation between patients' and caregivers' assessment of reported pain. The Stoplight Pain Scale is a simple, easy to administer tool that may have a role in empowering family involvement in ED pain management. Future research should focus on at-home study of the tool.

THE REVISED METRIQ SCORE: AN INTERNATIONAL USABILITY ANALYSIS OF A QUALITY EVALUATION INSTRUMENT FOR MEDICAL EDUCATION BLOGS

Colmers-Gray I¹, Krishnan K, Chan TM, Trueger NS, Paddock M, Grock A, Zaver F, Thoma B

¹Department of Emergency Medicine, University of Alberta, Edmonton, Alberta.

INTRODUCTION: With the proliferation of medical education blogs, methods of measuring quality are becoming more critical. The Medical Education Translational Resources: Impact and Quality (METRIQ) Study rated the quality of blogs using the METRIQ-8 Score. This score demonstrated poor reliability. Our goal was to analyze user feedback on this tool and use this to guide creation of a more clear and user-friendly revised METRIQ (rMETRIQ) Score.

METHODS: The evidence-based 8-item METRIQ-8 Score was previously derived using a systematic review, qualitative analysis, two Delphi studies and a derivation study. In the METRIQ study, participants rated the quality of 15 EM-related blog posts using the METRIQ-8 Score. Participants used a 7-point scale (1=best) and comments to evaluate the METRIQ-8 Score on the clarity of specific elements. Usability ratings were summarized using mean scores and % of participants rating an item unclear. Comments underwent qualitative thematic analyses. Qualitative feedback guided the development of the rMETRIQ Score.

RESULTS: 309 EM attendings, residents and medical students completed the study. Global ratings were good overall for ease of use (mean 2.7 ± 1.3). Participants reported positively on the score's structure, systematic nature, and straightforwardness. Overall, they found it useful for guiding learners and blog creators. Q2 (review processes), Q4 (editorial processes), Q5 (reference consistency), and Q7 (learner interactions) were marked unclear by >10% of participants. Qualitative analysis of comments identified areas for improvement. The following major changes were made: scoring scale was shortened to 4 points per question; specific anchors were developed to score each question; ambiguous terminology was clarified; and questions were grouped into 3 thematic categories. Due to overlap, Q2 and Q4 were combined, as were Q3 (reference citation) and Q5. A new question was added to evaluate writing and formatting.

CONCLUSION: A robust usability analysis of feedback on the METRIQ-8 Score highlighted areas for improvement and led to the more user-friendly rMETRIQ Score. Though it requires validation, the rMETRIQ Score has improved clarity and thus reliability among untrained raters. We hope this score will serve as a quality benchmark for blog users and producers.

DEVELOPMENT AND IMPLEMENTATION OF A WORKSHOP FOR ADVANCED CARE PLANNING AND GOALS OF CARE CONVERSATIONS IN THE EMERGENCY DEPARTMENT

Fletcher C¹, Brisebois A, Gauri A, Ha D

¹Department of Emergency Medicine, University of Alberta, Edmonton, Alberta.

INTRODUCTION: Advanced care planning (ACP) and Goals of Care (GOC) discussions are becoming increasingly common in our emergency departments (ED). The national ACP task group has found that the majority of Canadians have not had prior ACP/GOC discussions, nor have they obtained proper documentation of their wishes. The task of having these difficult but important conversations falls frequently to the ED. Despite this, our emergency medicine (EM) residents receive little formal training in ACP discussions. To address this need, we developed and implemented a workshop in ACP/GOC conversations for the University of Alberta EM academic curriculum.

METHODS: A literature search was performed to identify best practices for ACP discussions in the ED, barriers to ACP in the ED, and tools for identifying ED patients appropriate for ACP. Experts in ACP/palliative care and staff ED physicians were asked to identify previous difficult ACP discussions and highlight aspects of these cases that were challenging in the ED environment. These experiences, best practices and published APC curricula informed the development of a 3-hour case-based workshop that was implemented in the 2016/17 academic year for EM staff and residents.

RESULTS: Cases utilized in the workshop emphasized common ACP/GOC situations that occur in the emergency department: Case 1: An 84 year old with C1 GOC whose family did not accept the GOC designation. Case 2: A 72 year old with multiple comorbidities arriving intubated with no GOC documented. Case 3: An 82 year old with decreased LOC whose family asks for an ACP discussion in the ED. Participants were divided into groups (5-6 members). Each small group analyzed and discussed each case before the participants reconvened and discussed their opinions in one large group. ACP experts from palliative care, emergency medical services and EM facilitated the discussions highlighting the best practices from the literature for each case reviewed. Pre and post Likert surveys were distributed to workshop participants to assess changes in confidence in a variety of domains. A Wilcoxon Signed Rank Test showed statistically significant improvement in learner confidence within the following areas (N=21; P<0.05): identifying patients appropriate for GOC discussions, initiating GOC discussions, and identifying barriers to GOC, in the ED. The majority (89%) of participants agreed the workshops should become part of our academic curriculum.

CONCLUSION: An ACP/GOC workshop was successfully implemented and further ACP/GOC sessions are planned for the upcoming academic year. Looking ahead, we will look at using other teaching modalities such as simulation to further enhance the delivery of the curriculum. We will also attempt to capture defined physician behaviors (e.g. documenting GOC in the ED chart, sending letters to family physicians

documenting GOC discussions) to gauge uptake of the workshop principles into clinical practice.

PREDICTORS OF ADMISSION IN UNSCHEDULED RETURN VISITS TO THE EMERGENCY DEPARTMENT

Hayward J¹, Hagtvedt R, Ma W, Gauri A, Vester M, Holroyd BR

Department of Emergency Medicine, University of Alberta, Edmonton, Alberta.

INTRODUCTION: The 72-hr unscheduled return visit (URV) of an emergency department (ED) patient is often used as a key performance indicator in Emergency Medicine. Patients with unscheduled return visits and admission to hospital (URVA) may represent a distinct subgroup of URVs compared to unscheduled return visits with no admission (URVNA).

METHODS: A retrospective cohort study of all 72-hr URVs in adults across nine EDs in the Edmonton Zone (EZ) over a one-year period (Jan 1 2015 – Dec 31 2015) was performed using ED information system data. URVA and URVNA populations were compared and a multivariable analysis identified predictors of URVA.

RESULTS: Analysis of 40,870 total URV records, including 3,363 URVAs, revealed predictors of URVA on the index visit including older age (>65 yrs, OR 3.6), fewer annual ED visits (<4 visits, OR 2.0), higher disease acuity (CTAS 2, OR 2.6), gastrointestinal presenting complaint (OR 2.2), presenting to a large referral hospital (OR 1.4), and more hours spent in the ED (>12 hours, OR 2.0). A decrease in CTAS score (increase in disease acuity) upon return visit was also a risk factor (-1 CTAS level, OR 2.6). ED crowding at the index visit, as indicated by occupancy level, was not a predictor.

CONCLUSION: We demonstrate that URVA patients comprise a distinct subgroup of 72-hr URVs across an entire health region. Risk factors for URVA are present at the index visit suggesting that patients at high risk for URVA may be identifiable prior to admission.