

## MP27

**Designing team success - an engineering solution to avoid chest tube equipment chaos using best available evidence, consensus and prototyping**

R. Hanlon, BN, BSc, J. French, BSc, MBChB, P. Atkinson, MBChB, MA, J. Fraser, BN, S. Benjamin, BN, J. Poon, MD, Dalhousie Medicine New Brunswick, Saint John, NB

**Background:** Chest tube insertion is a time and safety critical procedure with a significant complication rate (up to 30%). Industry routinely uses Lean and ergonomic methodology to improve systems. This process improvement study used best evidence review, small group consensus, process mapping and prototyping in order to design a lean and ergonomically mindful equipment solution. **Aim Statement:** By simplifying and reorganising chest tube equipment, we aim to provide users with adequate equipment, reduce equipment waste, and wasted effort locating equipment. **Measures & Design:** The study was conducted between March 2018 and November 2018. An initial list of process steps from the best available evidence was produced. This list was then augmented by multispecialty team consensus (3 Emergency Physicians, 1 Thoracic Surgeon, 1 medical student, 2 EM nurses). Necessary equipment was identified. Next, two prototyping phases were conducted using a task trainer and a realistic interprofessional team (1 EM Physician, 1 ER Nurse, 1 Medical student) to refine the equipment list and packaging. A final equipment storage system was produced and evaluated by an interprofessional team during cadaver training using a survey and Likert scales. **Evaluation/Results:** There were 47 equipment items in the pre-intervention ED chest tube tray. After prototyping 21 items were removed while nine critical items were added. The nine items missing from the original design were found in four different locations in the department. Six physicians and seven RNs participated in cadaver testing and completed an evaluation survey of the new layout. Participants preferred the new storage design (Likert median 5, IQR of 1) over the current storage design (median of 1, IQR of 1). **Discussion/Impact:** The results suggest that the lean equipment storage is preferred by ED staff compared to the current set-up, may reduce time finding missing equipment, and will reduce waste. Future simulation work will quantitatively understand compliance with safety critical steps, user stress, wasted user time and cost.

**Keywords:** chest tube, lean, quality improvement and patient safety

## MP28

**Reigniting improvements in emergency departments – New approaches to resolving unsolvable problems**

N. Barclay, MD, J. McDuff, MSN, M. Vanosch, MSN, L. Bournelis, MN, MA, S. Finamore, MSN, University of British Columbia, New Westminster, BC

**Background:** In 2016 The Fraser Health Authority's Emergency Network established a priority to standardize patient access and flow through their 13 emergency departments (ED). A Model of Care (MOC) was developed after an extensive review of the literature and current practices across BC. **Aim Statement:** The ED Model of Care (MOC) specifies best practice expectations with respect to emergency patient access and flow. Rather than a 'top-down' mandate of expected practices, the MOC provided the opportunity for site-based teams to promote solutions that were 'locally actioned and regionally enabled'. **Measures & Design:** ED Quality Improvement (QI) teams were developed at all sites. The ED Network developed a "QI

Bootcamp", a one-day course focused on imparting tools to drive improvements, providing a baseline understanding of how to launch and sustain local QI initiatives. Using Prosci's change approach, an emphasis was placed on using local ingenuity to implement plans, analyze feedback and diagnose gaps. This approach measured utilization of the changes to tangibly link initiatives and change to specific outcomes. As part of this strategy, an online scorecard was created to measure local results against best practice outcomes. The scorecard tracked quantitative access metrics such as ED Length of Stay (EDLOS), Left Without Being Seen rate, and triage time. Measures such as forming a QI team, identifying a QI project and completing a PDSA cycle were included in the scorecard. **Evaluation/Results:** The MOC change management strategy was launched in May of 2018. By December 2018 all 13 EDs had formed a local QI team and identified a project. Twelve sites had completed at least one PDSA cycle and 10 sites had at least 75% of their members attend the QI Bootcamp. The scorecard displayed improvements in flow metrics. Highlights include the average arrival to triage time decreasing by 36% at one site, EDLOS for moderately ill patients decreased from 4.8 to 3.4 hours at another, and a community hospital had low acuity patient EDLOS decrease from 3.52 to 2.37 hours. **Discussion/Impact:** A standardized approach to patient access and flow in the ED (MOC), combined with the engaging grass roots approach to inspiring local innovation, allied with a concrete change management approach demonstrated significant results for patients accessing and moving through EDs. This pattern that is more likely to sustain itself because the results are felt and locally owned.

**Keywords:** emergency access, patient flow, quality improvement and patient safety

## MP29

**Community based naloxone usability testing**

S. VandenBerg, MD, MSc, G. Harvey, BA, MA, J. Martel, S. Gill, BN, J. McLaren, BN, University of Calgary, Calgary, AB

**Background:** In Alberta in 2016 more people died from an opioid overdose than from motor vehicle crashes. Naloxone is an opioid antagonist - it can reverse an opioid overdose for a period of 30 to 60 minutes. Naloxone kits are available free at emergency departments and community organizations around the province with training provided at the point of pickup. It is possible that training may be refused or may be forgotten and people are often left to rely solely on the instructions included in the kit. Human centred design can improve the way people interact with overdose instructions. **Aim Statement:** This study will measure the effectiveness and usefulness of prototype community naloxone kit instructions over a six month period of time (2018) in Calgary and Edmonton with the aim to use human centred design principles to improve the way people interpret emergency overdose response directions. **Measures & Design:** Information design experts engaged people with lived experience to provide a process map outlining the current role that educational materials and instructions for community naloxone kits play in responding to an opioid overdose. Alberta Health Services (AHS) Human Factors, in collaboration with AHS harm reduction developed the protocol and administered pre- and post-questionnaire and specific 'performance checkpoints' intended to measure effectiveness and usefulness. A simulated overdose including a mannequin, injection trainer and anatomical paper diagram was designed and a community naloxone kit with instructions setting was provided. Participants were recruited through harm reduction nurses with

pre-existing clinical relationships (experienced group), family and friends of people who use opioids and general public (non-experienced) through the University of Alberta Faculty of Art and Design. **Evaluation/Results:** A total of 30 voluntary participants provided their informed consent and engaged in a simulated overdose scenario using a set of prototype instructions developed by a professional information designer. Through repeated data sampling, the following points were observed and will be integrated in the next iteration of design: It isn't clear to people what opioids are. It isn't clear to people that giving a dose of naloxone will not harm a person, especially if they have not overdosed. Almost none of the participants called 911. People seem to read pictures and text equally in the non-experienced group, but in the experienced group, typically read the pictures. Many participants stated that they knew how to do rescue breaths, but did not perform them correctly. Performing the procedure is a not the same as being asked about how to perform the procedure. **Discussion/Impact:** Even with new instructional prototypes, many participants identified components that were unclear or confusing. The experienced group made less mistakes than the non-experienced group. They seemed to be more invested or interested in saving a friend's life. These instructions will go through another round of design to incorporate feedback from end users. The final product will be part of a larger provincial emergency medicine initiative that includes participant led design and education around emergency response in opioid overdose settings.

**Keywords:** human centred design, naloxone, quality improvement and patient safety

### MP30

#### Implementing buprenorphine/naloxone in emergency departments for opioid agonist treatment: a quality improvement initiative

P. McLane, PhD, K. Scott, MBA, MA, Z. Suleman, MPH, J. Deol, MD, J. Fanaeian, MD, A. Olmstead, MD, M. Ross, BSc, MD, H. Hair, MBA, B. Holroyd, MBA, MD, E. Lang, MD, C. Biggs, BScPharm, M. Ghosh, MD, MSc, R. Tanguay, BSc, MD, A. Fisher, S. Fielding, MBA, University of Alberta, Edmonton, AB

**Background:** Buprenorphine/naloxone (bup/nal) is a partial opioid agonist/antagonist and recommended first line treatment for opioid use disorder (OUD). Emergency departments (EDs) are a key point of contact with the healthcare system for patients living with OUD. **Aim Statement:** We implemented a multi-disciplinary quality improvement project to screen patients for OUD, initiate bup/nal for eligible individuals, and provide rapid next business day walk-in referrals to addiction clinics in the community. **Measures & Design:** From May to September 2018, our team worked with three ED sites and three addiction clinics to pilot the program. Implementation involved alignment with regulatory requirements, physician education, coordination with pharmacy to ensure in-ED medication access, and nurse education. The project is supported by a full-time project manager, data analyst, operations leaders, physician champions, provincial pharmacy, and the Emergency Strategic Clinical Network leadership team. For our pilot, our evaluation objective was to determine the degree to which our initiation and referral pathway was being utilized. We used administrative data to track the number of patients given bup/nal in ED, their demographics and whether they continued to fill bup/nal prescriptions 30 days after their ED visit. Addiction clinics reported both the number of patients referred to them and the number of patients attending their referral. **Evaluation/Results:**

Administrative data shows 568 opioid-related visits to ED pilot sites during the pilot phase. Bup/nal was given to 60 unique patients in the ED during 66 unique visits. There were 32 (53%) male patients and 28 (47%) female patients. Median patient age was 34 (range: 21 to 79). ED visits where bup/nal was given had a median length of stay of 6 hours 57 minutes (IQR: 6 hours 20 minutes) and Canadian Triage Acuity Scores as follows: Level 1 – 1 (2%), Level 2 – 21 (32%), Level 3 – 32 (48%), Level 4 – 11 (17%), Level 5 – 1 (2%). 51 (77%) of these visits led to discharge. 24 (47%) discharged patients given bup/nal in ED continued to fill bup/nal prescriptions 30 days after their index ED visit. EDs also referred 37 patients with OUD to the 3 community clinics, and 16 of those individuals (43%) attended their first follow-up appointment. **Discussion/Impact:** Our pilot project demonstrates that with dedicated resources and broad institutional support, ED patients with OUD can be appropriately initiated on bup/nal and referred to community care.

**Keywords:** opioids, quality improvement and patient safety, transitions in care

### MP31

#### Safely reducing emergency physician admission rate through audit and feedback

N. Barclay, BSc, MD, University of British Columbia, New Westminster, BC

**Background:** Most admissions to hospitals occur through the emergency department (ED). The impact of emergency physicians' decisions to admit a patient to hospital can have wide ranging effects on health care spending, hospital congestion and patient outcomes. A growing body of evidence shows that outpatient management of conditions such as diverticulitis, heart failure and pulmonary embolism is both safe, effective and can reduce costs. **Aim Statement:** To support emergency staff in making safe, informed decisions to appropriately reduce admission rates without increasing the rate of patients returning and being admitted. **Measures & Design:** Significant variability in admission rates between emergency physicians exists and no correlation between actual and self-reported admission rates is observed. One means to change behavior is through audit and feedback, however a Cochrane review on this topic concluded that it was only effective if specific conditions were met; findings which were incorporated into this project. An audit tool was created comparing individual physicians' admission and "bounce back" rates to their peers. The tools contained averages for the individual and site for admission and bounce back rates and were shared with physicians every 2 months. Physicians were divided into three equal groups, low, medium and high admitters and targets established. Department heads met with high admitters. **Evaluation/Results:** The project was started in September 2016. Admission rates in the three physician groups were compared in the ten months before September 2016 (prior) and after January 2017 (post). September to December 2016 was considered the "rollout" period and not included in the analysis. Significance was tested using a Permutation test and a p-value cut off level of 5%. Nine emergency departments took part. Seven sites experienced a significant decrease in the admission rate of top admitters, three showed a significant increase in the rate of low admitters and two showed a significant increase in the rate of medium admitters. Pooled results showed a decrease in the admission rates of the top admitters and no significant change to the medium or low admitters. **Discussion/Impact:** Comparing the pre- and post-periods yielded a decrease in admissions of 773 patients on an annualized basis. The