of pinpoint pupils, initial oxygen saturation, initial Glasgow Coma Score (GCS), respiratory rate, or time on scene. Both patient groups were managed similarly with respect to route of naloxone administration and the use of a bag valve mask. All patients who were intubated were in the no confirmed history group (n = 5; p = 0.003). Post naloxone there were no differences in last recorded vital signs except the no confirmed history group was less likely to achieve a GCS 10 (57% versus 89%; p < 0.001). The overall post-naloxone development of agitation (9%) was moderate while the need for physical/chemical restraint (2%) was low with no differences between groups. All patients were transported to the hospital. **Conclusion:** A substantial proportion of patients who received naloxone did not have a confirmed history of an opioid overdose. These patients closely resembled those with a confirmed history with respect to demographics and physical characteristics. The primary difference was a lower proportion of patients with no confirmed history who achieved a post naloxone GCS 10. Despite a moderate development of post naloxone agitation, paramedics were able to manage most of these patients without the use of physical/chemical restraints.

Keywords: emergency medical services, opioid overdose, naloxone

P015
Staff skills: a procedural skills curriculum for emergency medicine attending physicians in Calgary

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Introduction: Emergency medicine attending physicians perform many essential procedures but some infrequently. Skill proficiency and familiarity declines over time. We intended to identify skills where colleagues felt deficient and create an opportunity to demonstrate and practice in a safe environment. **Methods:** Sessions began from a review of ultrasound guided central line and pacemaker insertion. Other procedures have been added as a result of critical incidents, needs assessments by attending physicians, acquisition of new technology/equipment and expert consensus. An evaluation and needs assessment is performed after each session to adjust curricula. **Results:** Since 2011, we have held 2-3 skill sessions per year at the Advanced Trauma Surgical Skills Laboratory at the University of Calgary. Sessions are taught by attending emergency physicians, employ task trainers, simulators, animal and human cadaveric models, ultrasound, and procedural equipment stocked in our local hospitals. We are able to accommodate ~30 participants per session for 3 hours of rotating 7-8 participants through various stations. Every session has been fully attended with a wait list. Physicians register by email with preference given to new participants and those identified during clinical practice review of requiring remediation. Costs of sessions are covered by voluntary contribution to an emergency department physician support fund. Procedures practiced have included airway (basic, adjuncts, bronchoscopy, video laryngoscopy, surgical airway, chest tube), vascular access (ultrasound guided central venous insertion, transvenous pacemaker insertion, nerve blocks, IO insertion), surgical skills (thoracotomy, chest tube, canthotomy, surgical airway) and other percutaneous procedures (paracentesis, thoracentesis, nerve block, lumbar puncture). High fidelity skills videos were created to augment the sessions, available on the department website. Four point scale evaluations from our most recent session yielded 100% excellent rating for overall workshop and relevance to practice. The 6 facilitators performance received 100% excellent or good ratings. **Conclusion:** We have developed a fun, nonthreatening opportunity for attending physicians to practice infrequent but important ED procedures. The sessions are well received, well

attended, foster collegiality, confidence and competence in performance of infrequent ED skills. Our model could be generalized to other centres.

Keywords: innovations in emergency medicine education, procedural skills, attending physician

P016
Junior and senior clinician educators rank key medical education articles differently depending on topic

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Introduction: Medical education includes a diverse range of topics and disciplines. For junior clinician educators, it may be difficult to get a grasp of pertinent literature. Our study aims to retrospectively identify whether senior clinician educators (SCEs) and junior clinician educators (JCEs) differ in their selection of what they perceive as key medical education articles. **Methods:** As a part of the Academic Life in Emergency Medicine (ALiEM) Faculty Incubator program, we developed a series of primer articles for JCEs over the preceding year, designed to enhance their educational growth by identifying and discussing key articles within specific medical education arenas. Each set of articles within the primer series were selected based on data collected from JCEs and SCEs, who ranked the specific articles with respect to their perceived relevancy to the JCEs. ANOVA analysis was performed for each of the nine primer series to determine whether there was a statistically significant difference between senior and junior CEs ratings of articles. **Results:** 216 total articles were evaluated within the nine different primer topics. Through a multilevel regression analysis of the data, no statistically significant difference was found between the rankings of papers by SCEs and JCEs (95% CI: -0.27, 0.40). However, a subgroup analysis of the data found that 3 of the 9 primers showed statistically significant divergence based on seniority (p < 0.05). **Conclusion:** Based on this data, involvement of JCEs in the consensus-building process was important in identifying divergence in views between JCEs and SCEs in one-third of cases. To our knowledge, no other group have compared whether junior and senior clinical educators may have divergent opinions about the relevance of medical education literature. Our findings suggest that it may be important to involve JCEs in selecting articles that are worthwhile for their learning, since SCEs may not fully understand their needs.

Keywords: innovations in emergency medicine education, mismatch between junior and senior clinical educator priorities

P017
When the rules hit the road: how emergency physicians make decisions in the era of the clinical decision rules

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Introduction: The diagnostic process is wrought with potential sources of error. Psychologists seek to coach physicians to refine their cognition. Researchers try to create cognitive scaffolds to guide decision-making. Physicians however, are caught in middle between their own daily cognitive processes and these external theories that might influence their behaviour. Few attempts have been made to understand how experienced clinicians integrate guidelines or clinical decision rules (CDRs) into their decision-making. We sought to explore experienced clinicians decision-making via a simulated exercise, to develop a model of how physicians integrate CDRs into their diagnostic thinking. **Methods:** From July 2015-March 2016, 16 practicing emergency physicians (EPs)

were interviewed via a think aloud protocol study. Six cases were constructed and video recorded as prompts to spur the clinicians to think aloud and describe their approach to the cases. Cases were designed to be slightly suggestive for pulmonary embolism or deep vein thrombosis, since these conditions are associated with CDRs. Using a constructivist grounded theory analysis, three investigators independently reviewed the transcripts from the interviews, meeting regularly to discuss emergent themes and subthemes until sufficiency was reached. Disagreements about themes were resolved by discussion and consensus. **Results:** Our analysis suggests that physicians engage in an iterative process when they are faced with undifferentiated chest pain and leg pain cases. After generating an original differential diagnosis, EPs engage in an iterative diagnostic process. They flip between hypothesis-driven data collection (e.g. history, physical exam, tests) and analysis of this data, and use this process to weigh probabilities of various diagnoses. EPs only apply CDRs once they are sufficiently suspicious of a diagnosis requiring guidance from a CDR and when they experience diagnostic uncertainty or wish to bolster their decision with evidence. **Conclusion:** EP cognition around diagnosis is a dynamic and iterative process, and may only peripherally integrate relevant CDRs if a threshold level of suspicion is met. Our findings may be useful for improving knowledge translation of CDRs and prevent diagnostic error. **Keywords:** clinical decision making, clinical decision rules, clinical reasoning

P018

Blocked practice outperforms random practice for learning resuscitative transesophageal echocardiography: a randomized controlled trial

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Introduction: Resuscitative clinician-performed transesophageal echocardiography (TEE) is a relatively new ultrasound application, however the optimal teaching methods have not been determined. Previous studies have demonstrated that random practice (RP), which increases the variability of training, may improve learning of procedural skills compared with blocked practice (BP). We compared RP and BP for teaching a resuscitative TEE protocol to emergency medicine residents using a simulator. **Methods:** We recruited emergency medicine residents with no prior TEE experience from a university-affiliated hospital. Participants completed a questionnaire and baseline skill assessment on a simulator, then were randomized to one of two groups. The BP group completed 10 repetitions of a fixed 5-view TEE sequence with instructor feedback, while the RP group completed 10 different random 5-view TEE sequences with feedback. Participants completed a simulation-based performance assessment immediately, and a transfer test consisting of a simulated patient encounter 1-2 weeks after training. Ultrasound images and transducer motion metrics were captured by the simulator for blinded analysis. Our primary outcome was the percentage of successful views on the transfer test, and secondary outcomes included participants confidence level, image quality, percentage of correct diagnoses, and efficiency of movement. We compared all scores using two-tailed, independent samples t-tests. **Results:** 22 participants completed the study (11 in the RP group, 11 in the BP group). There were no significant baseline differences between the groups. The BP group had a higher rate of successful views compared with the RP group on the transfer test (92.7% vs. 80.9%, p = 0.02). While not statistically significant, the BP group had higher image quality on a 5-point scale (3.2 vs. 2.9, p = 0.09), and fewer probe accelerations (297 vs. 403, p = 0.09). The groups did not differ in rate of correct diagnoses (77.3%

vs. 72.7%, p = 0.73), confidence level on a 10-point scale (6.2 vs. 6.2, p = 1.0), or scan time (173 vs. 199 seconds, p = 0.28). **Conclusion:** Emergency medicine residents randomized to BP had a higher success rate on a transfer test, compared to RP when learning resuscitative TEE using a simulator. We consider this pilot work that can inform future studies in both simulation and real clinical settings. **Keywords:** transesophageal echocardiography, emergency ultrasound, medical education

P019

The path of least resistance: how computerized provider order entry can lead to (and reduce) wasteful practices

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Introduction: Background Computerized provider order entry (CPOE) is rapidly becoming the mainstay in clinical care and has the potential to improve provider efficiency and accuracy. However, this hinges on careful planning and implementation. Poorly planned CPOE order sets can lead to undetected errors and waste. In our emergency department (ED), lactate dehydrogenase (LDH) was bundled into various blood work panels, but had little clinical value. Aim Statement This quality improvement initiative aimed to reduce unnecessary LDH testing in the ED. **Methods:** Methods A group of ED physicians reviewed CPOE blood work panels and uncoupled LDH in conditions where it was deemed not to provide any clinically useful information. We measured the daily number of LDH tests performed before and after its removal. We tracked the frequency of other serum tests as controls. We also analyzed the number of add-on LDH (i.e. to add LDH to samples already sent to the lab) as a balancing measure, since this can disrupt work flow and delay care. **Results:** Results Through this intervention, we reduced the number of LDH tests performed by 69%, from an average of 75.1 tests per day to 23.2 (p < 0.0005). The baseline controls did not differ after the intervention (e.g. a complete blood count was performed 197.7 and 196.1 times per day pre- and post-intervention, respectively [p = 0.7663]). There was less than 1 add-on LDH per day on average. This translates to a cost savings of $33,340.65 at our institution. **Conclusion:** Conclusions CPOE care templates can be powerful in shaping behaviours and reducing variability. However, close oversight of these panels is necessary to prevent errors and waste. **Keywords:** quality improvement and patient safety, computerized provider order entry, order sets

P020

Post-return of spontaneous circulation care and outcomes a single centre experience

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Introduction: Out of hospital cardiac arrest (OHCA) continues to carry a very high mortality rate, with approximately 10% surviving to hospital discharge. In 2015, the American Heart Association release updated guidelines dictating best practices in post-return of spontaneous circulation (ROSC) care, advocating for more liberal utilization of emergent coronary angiography. We sought to determine if the post-ROSC care at our centre during our study period adhered to the previously published (2010) guidelines. **Methods:** We performed a retrospective analysis (Sept. 2011 - June 2015) of the Resuscitation Outcomes Consortium (ROC) database, which contains pre-hospital, hospital and outcomes data on adult, EMS-treated, non-traumatic OHCA. Patients under 18 years, with missing age data or with obvious non-cardiac causes of arrest were