

from peers and facilitators. Two-weeks later, participants brought their completed articles for peer and expert review before submitting their final article. **Conclusion:** The innovation bolstered resident physician confidence in advocacy through the popular press, and provided demonstrable skills in opinion writing. Participants felt challenged to develop compelling narratives and differentiate this form of advocacy communication from academic writing or prior media training. Participants valued the workshop as a voluntary component of residency education led by peer experts. Through their writing, residents demonstrated an understanding of structural factors that impact patient health and health systems. Future engagement as physician advocates may be tempered by fears of professional repercussions for public engagement; the impact of physician advocacy on population health outcomes is not yet known.

**Keywords:** advocacy, innovations in EM education

### MP27

#### Using a massive online needs assessment to guide the evolution of the EM Sim Cases website

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**Innovation Concept:** EM Sim Cases is an innovative, open-access website that was created in 2015 to publish medical simulation resources including standardized, peer-reviewed simulation cases. Herein we describe our interim analysis. **Methods:** We performed a massive online needs assessment using a methodology previously described by Chan et. al. to determine how we can shape EM Sim Cases to meet the needs of learners and educators who use it. We engaged with simulation experts from the Emergency Medicine Simulation Education Research Collaborative to design a Google Forms survey using best practices in survey design. We distributed the survey to our target community of practice via Twitter, email, and a blog post published on emsimcases.com. **Curriculum, Tool, or Material:** We received 81 responses from simulation educators representing 8 medical specialties and 13 countries. Most survey respondents identified themselves as staff physicians (n = 44) and specialized in emergency medicine (n = 39). They had 0-21+ years of experience. 37% of respondents (n = 30) stated that material from EM Sim Cases makes up 25% or more of their simulation curriculum. Several respondents noted that using this content made them feel more confident and more current. Respondents praised EM Sim Cases for a well-organized case format, the proper level of detail, consistency between case designs, and the wide variety of cases. Suggested improvements included an opportunity to directly comment on cases and more cases in pediatric, rural, and advanced airway management situations. Suggestions were made to improve the navigability of the website. Respondents wanted to see additional blog content on debriefing strategies and self-made task/skill trainers. **Conclusion:** EM Sim Cases is a novel, free open-access simulation resource. Using a massive online needs assessment we were able to determine future directions including case topics, website reorganization, and educational material. We were also able to capture how impactful a resource like this can be to clinical and educational practice outside of the simulation setting.

**Keywords:** innovations in EM education, needs assessment, simulation

### MP28

#### Development and validation of a novel three-dimensional printed thorax model simulator for the simulation-based training of tube thoracostomy

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**Innovation Concept:** High-acuity, low-occurrence (HALO) procedures require skilled performance as they treat life-threatening conditions and are associated with significant morbidity when performed incorrectly. Simulation has proven useful for deliberate practice in a low stake setting. Tube thoracostomy is amenable to this approach. Commercially available trainers exist but often have limited realism and are prohibitively expensive particularly to non-academic centers. Three-dimensional (3D) printing produces models suitable for simulation, but no current simulator has been developed and validated for tube thoracostomy. The aim of this study was to develop such, a 3D-printed low-fidelity simulator validated for the simulation-based instruction of tube thoracostomy. **Methods:** The development of the simulator followed an iterative design cycle with collaboration between a design team and an emergency medicine expert. Its validity (face and content) was tested through hands-on practice and surveys completed by 15 acute-care practitioners. Participants performed the procedure on the simulator and then provided feedback through a mixed quantitative/qualitative product evaluation survey on appearance, realism (face validity) and value in procedural training (content validity). Mean values for overall appearance and content validity as a training tool were 4/5 and 4.3/5 respectively. All respondents felt the model was a useful adjunct. All but one stated it was a good replacement for pre-existing trainers. **Curriculum, Tool, or Material:** The model was initially printed in three parts using an Ultimaker 3 and Axiom Airwolf Dual 3D-printer. The ribcage was created using polylactic acid with polyvinyl alcohol support material. Printed sections were bonded using glue at interfaces requiring no flexibility. Flexible joints were made of varying amounts of thermoplastic polyurethane and thermoplastic elastomer. Skin overlay for the whole model was created with a cut out area for replaceable sections that subjects would incise to insert the chest tube. Skin was casted using platinum cured silicone in a 3D-printed mold. Total cost of all materials was roughly 80 CAD. **Conclusion:** The simulator was found to be a useful adjunct for the simulation-based practice of tube thoracostomy. As well, users found the model anatomically realistic and avoided high-cost and ethical issues. Further research will focus on optimization based on feedback and development into a multi-functional simulator for other HALO procedures.

**Keywords:** simulation-based training, three-dimensional printing, innovations in EM education

### MP29

#### Using the Calgary audit and feedback framework to get the most out of physician practice reports

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**Innovation Concept:** The Calgary Audit and Feedback Framework (CAFF) is an innovative tool developed by the Physician Learning Program (PLP). By addressing four key factors –relationships, question choice, data visualization, and facilitation – CAFF addresses common barriers to physicians receiving their practice data. The goal of this study is to assess whether CAFF-facilitated physician

performance improvement (PPI) sessions: 1) improve physicians' receptiveness to their practice data, and 2) encourage physicians to both identify opportunities for practice change and create action plans. **Methods:** Peer facilitators were trained to facilitate PPI sessions using the CAFF model. In Calgary, 51/180 emergency physicians have attended at least one of the six PPI sessions. The sessions were evaluated using surveys, commitment to change forms, and the Feedback Orientation Scale (FOS). The FOS is a scale developed to measure a participant's orientation to performance feedback across the four domains of utility, accountability, social awareness, and feedback self-efficacy. **Curriculum, Tool, or Material:** The PLP has developed and implemented CAFF as a framework to help foster socially constructed learning in audit and group feedback sessions. The CAFF model ensures that the aforementioned four key factors are considered for design and implementation of audit and group feedback. The PLP found that establishing the meaning and credibility of the data is a necessary precursor to reflection and action planning. **Conclusion:** The FOS was completed for 25/32 physicians. The mean FOS score improved by 0.339 ( $p < 0.001$ ;  $z = -3.863$ ). While the mean scores all four domains increased, 'Feedback Self-Efficacy' increased the most by .0620 ( $p < 0.001$ ;  $z = -3.999$ ). Participants reported that examples of changes made by the peer facilitators were particularly helpful. Evaluations from the sessions suggested physicians overwhelmingly agreed or strongly agreed that the peer comparison was valuable, that the reports helped them reflect on their practice, and that the session helped them identify learning opportunities and strategies to change their practice.

**Keywords:** innovations in EM education, physician practice reports, practice improvement

### MP30

#### Reducing unnecessary oral contrast in patients undergoing enhanced abdomen/pelvis computed tomography in the emergency department: A multicentre project

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**Background:** Traditionally, radiologists have routinely recommended oral contrast agents (such as Telebrix®) for patients undergoing a computed tomography of the abdomen/pelvis (CTAP), but recent evidence has shown limited diagnostic benefits for most emergency department (ED) patients. Additionally, the use of oral contrast has numerous drawbacks, including patient nausea/vomiting, risk of aspiration and delays to CTAP completion and increased ED length of stay (LOS). **Aim Statement:** The aim was to safely reduce the number of ED patients receiving oral contrast prior to undergoing CTAP and thereby reduce ED length of stay. **Measures & Design:** An evidence-based ED protocol was developed in collaboration with radiology. PDSA cycle #1 was implementation at a pilot site to identify potential barriers. Challenges identified included the need to change the electronic order sets to reflect the new protocol, improved communication with frontline providers and addition of an online BMI calculator. PDSA cycle #2 was widespread implementation across all 4 ED's in the Calgary zone. The protocol was incorporated into all relevant electronic ED order sets to act as a physician prompt. Using administrative data, we extracted and analyzed data using descriptive and inferential statistics for the outcomes and balancing measures from a period of 12 months pre- and 12 months post-intervention. **Evaluation/Results:** A total of 14,868 and 17,995

CTAP exams were included in the pre and post periods, respectively. There was a reduction in usage of oral contrast from 71% to 30% ( $P < 0.0001$ ) in the pre- and post-study period, respectively. This corresponded to a reduction in average time of CT requisition to CT report completed from 3.30 hours to 2.31 hours (-0.99 hrs,  $P = 0.001$ ) and a reduction in average ED LOS from 11.01 hours to 9.92 hours (-1.08 hrs,  $P < 0.0001$ ). The protocol resulted in a reduction of 19,434.6 patient hrs in the ED. Run charts demonstrate change was sustained over time. Our protocol did not demonstrate an increase in rates of repeat CTAP ( $P = 0.563$ ) at 30 days, nor an increase in patient re-admission within 7 days ( $P = 0.295$ ). **Discussion/Impact:** Successful implementation of an ED and radiology developed protocol significantly reduced the use of oral contrast in patients requiring enhanced CTAP as part of their diagnostic work up and, thereby, reduced overall ED LOS without increasing the need for repeat examinations within 30 days or re-admission within 7 days.

**Keywords:** computed tomography, oral contrast, quality improvement and patient safety

### MP31

#### Optimizing ketorolac dosing by leveraging computerized order entry

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**Background:** Ketorolac has long been used to manage pain in the Emergency Department and has the advantage of being the only parenteral NSAID formulation. Despite multiple studies demonstrating an analgesic ceiling dose of 10mg for intravenous ketorolac, higher doses (30-60mg) are commonly ordered. Use of optimal doses of ketorolac (10mg) has the advantage of lower side effects and cost. **Aim Statement:** The aim of this project was to increase the usage of the optimal dose parenteral ketorolac (10mg) without increasing the use of additional, concomitant or rescue opioids (balancing measures). **Measures & Design:** This pre-/post-intervention comparison study (May 1, 2016 to April 30, 2018) included all patients  $\geq 18$  years of age that received parenteral ketorolac at one of 4 EDs in the Calgary zone. All data was captured via administrative data records. Stakeholders (ED leadership, analgesia committee, nursing and pharmacy) provided feedback and support for the project. Our multi-modal intervention included modifying all ED computerized order sets such that the default parenteral ketorolac dose was 10mg (post-intervention) from 30mg (pre-intervention), education (dissemination of evidence to support the changes to clinicians) and our pharmacy securing 10mg vials of ketorolac. At their discretion, physicians' were still able to order other doses of ketorolac. **Evaluation/Results:** During the 2 year study period, 19290 patient records were identified where parenteral ketorolac was administered during the ED visit. Baseline characteristics were similar between the pre/post periods. Prior to the change in default dosing, 10.5% of orders were for ketorolac 10mg compared to 87% in the post-intervention period ( $p < 0.000$ ). Statistical process charts support the above results and demonstrate that the changes have been sustained. There were no differences in patients receiving ketorolac as the only analgesic between the pre/post periods (42% vs 42%,  $p = 0.396$ ), nor were there significant changes in concomitant opioid usage (46% vs 46%,  $p = 0.817$ ), or rescue analgesia (11% vs 12%,  $p = 0.097$ ). **Discussion/Impact:** In this large cohort, our multi-modal intervention, resulted in a significant increase in optimal ketorolac parenteral dosing without a significant change in additional opioid use. The results support the utility of