

Introduction/Innovation Concept: Utilization of CT imaging has increased dramatically over the past two decades, but has not necessarily improved patient outcomes. As healthcare spending grows unsustainably and evidence of harms from unnecessary testing accrues, there is pressure to improve imaging appropriateness. However, prior attempts to reduce unnecessary imaging using evidence-based guidelines have met with limited success, with common barriers cited including a lack of confidence in patient outcomes, medicolegal risk, and patient expectations. This project attempts to address these barriers through the development of an electronic clinical decision support (CDS) tool embedded in clinical practice. **Methods:** An interactive web-based point-of-care CDS tool was incorporated into computerized physician order entry software to provide real-time evidence-based guidance to emergency physicians for select clinical indications. For patients with mild traumatic brain injury (MTBI), decision support for the Canadian CT Head Rule pops up when a CT head is ordered. For patients with suspected pulmonary embolism (PE), the tool is triggered when a CT pulmonary angiogram is ordered and provides CDS for the Pulmonary Embolism Rule-out Criteria (PERC), Wells Score, age-adjusted D-dimer and CT imaging. To study the impact of the tool, all emergency physicians in the Calgary zone were randomized to receive voluntary decision support for either MTBI or PE. **Curriculum, Tool, or Material:** The tool uses a multifaceted approach to inform physician decision making, including visualization of risk and quantitative outcomes data and links to primary literature. The CDS tool simultaneously documents guideline compliance in the health record, generates printable patient education materials, and populates a REDCap™ database, enabling the creation of confidential physician report cards on CT utilization, appropriateness and diagnostic yield for both audit and feedback and research purposes. Preliminary data show that physicians are using the MTBI CDS approximately 30% of the time, and the PE CDS approximately 40% of the time. Evaluation of CDS impact on imaging utilization and appropriateness is ongoing. **Conclusion:** A voluntary web-based point-of-care decision support tool embedded in workflow has the potential to address many of the factors typically cited as barriers to use of evidence-based guidelines in practice. However, high rates of adherence to CDS will likely require physician incentives and appropriateness measures.

Keywords: knowledge translation, decision support, diagnostic imaging

LO23

A brief educational session is effective for teaching emergency medicine residents resuscitative transesophageal echocardiography
 J. Chenkin, MD, MEd, E. Hockmann, MD, Sunnybrook Health Sciences Centre, Toronto, ON

Introduction: Resuscitative clinician-performed transesophageal echocardiography (TEE) is a relatively new ultrasound application that has the potential to guide the management of critically ill patients in the emergency department. The objective of this study was to determine the effectiveness of a brief training workshop for teaching a resuscitative TEE protocol to emergency medicine residents using a simulator. **Methods:** Emergency medicine residents with no prior TEE experience from a university-affiliated hospital were invited to participate in the study. Participants completed a questionnaire and baseline skill assessment using a high-fidelity simulator. The training session included a 20-minute lecture followed by 10 simulated repetitions of a 5-view TEE sequence with instructor feedback. Learning was evaluated by a skill assessment immediately after training and a transfer test 1-2 weeks after the training session. Ultrasound images and transducer motion metrics were captured by the simulator for blinded analysis. The primary outcome

of this study was the percentage of successful views before and after training. Secondary outcomes included confidence level, image quality, percentage of correct diagnoses, and efficiency of movement. Assessment scores were compared using a two-tailed t-test. **Results:** 10 of 11 (91%) of invited residents agreed to participate in the study. Confidence level on a 10-point numeric rating scale (NRS) increased from a baseline of 1.0 (SD 0) to 7.0 (SD 1.9) after training ($p < 0.01$). The mean duration between training and transfer test was 9.6 days (SD 1.9). The percentage of successful views increased from 44% at baseline to 100% after training, and 90% on the transfer test ($p < 0.01$). The mean image quality on a 5-point scale was 2.2 (SD 1.0) at baseline, 3.8 (SD 0.7) after training ($p < 0.01$), and 3.1 (SD 0.6) on the transfer test ($p < 0.01$). The mean number of transducer accelerations were 524 (SD 202) at baseline, 219 (SD 54) after training ($p < 0.01$), and 400 (SD 149) on the transfer test ($p = 0.13$). Participants made the correct diagnosis in 70% of cases on the transfer test. **Conclusion:** After a brief training session using a simulator, emergency medicine residents were able to generate adequate TEE images on a delayed transfer test. Future studies are needed to determine effective strategies for maintaining motion efficiency and imaging quality.

Keywords: ultrasound, education, simulation

LO24

Is prehospital care supported by evidence-based guidelines? An environmental scan and quality appraisal using AGREE II

S. Turner, BSc, E. Lang, MD, K. Brown, MD, C. Leyton, BA, E. Bulger, MD, M. Sayre, MD, D. Kraus, BSN, H. Lee Robertson, MLIS, University of Calgary, Calgary, AB

Introduction: The Institute of Medicine (IOM) has recommended that high-quality, evidence-based guidelines be developed for emergency medical services (EMS). The National Association of EMS Physicians (NAEMSP) has outlined a strategy that will see this task fulfilled, consisting of multiple working groups focused on all aspects of guideline development and implementation. A first step, and our objective, was a cataloguing and appraisal of the current guidelines targeting EMS providers. **Methods:** A systematic search of the literature was conducted in MEDLINE (1175), EMBASE (519), PubMed (14), Trip (416), and guidelines.gov (64) through May 1, 2016. Two independent reviewers screened titles for relevance to prehospital care, and then abstracts for essential guideline features, including a systematic review, a grading system, and an association between level of evidence and strength of recommendation. All disagreements were moderated by a third party. Citations meeting inclusion criteria were appraised with the AGREE II tool, which looks at six different domains of guideline quality, containing a total of 23 items rated from 1 to 7. Each guideline was appraised by three separate reviewers, and composite scores were calculated by averaging the scaled domain totals. **Results:** After primary (kappa 97%) and secondary (kappa 93%) screening, 49 guidelines were retained for full review. Only three guidelines obtained a score of >90%, the topics of which included aeromedical transport, analgesia in trauma, and resuscitation of avalanche victims. Only two guidelines scored between 80% and 90%, the topics of which included stroke and pediatric seizure management. One guideline, splinting in an austere environment, scored between 70% and 80%. Nine guidelines scored between 60% and 70%, the topics of which included ischemic stroke, cardiovascular life support, hemorrhage control, intubation, triage, hypothermia, and fibrinolytic use. Of the remaining guidelines, 14 scored between 50% and 60%, and 20 obtained a score of <50%. **Conclusion:** There are few high-quality, evidence-based guidelines in EMS. Of those that are published, the majority fail to meet established