

checklist. Following participation in the scenarios, participants completed either a 26-item (control group), or 35-item (checklist group) paper-based survey comprised of multiple-choice, Likert-type, rank-list and open-ended questions exploring their perceptions of the airway checklist (checklist group only) and simulation as a learning modality (all participants). **Results:** Fifty-four EM practitioners completed the questionnaire. Most control group participants ($n=24/25$, 96.0%) believed an airway checklist would have been helpful (scored 5/7 or greater) for the scenarios. The majority of checklist group participants ($n=29$) believed that the checklist was helpful for equipment (27, 93.1%) and patient (26, 89.6%) preparation, and post-intubation care (21, 82.8%), but that the checklist delayed definitive airway management and was not helpful for airway assessment, medication selection, or choosing to perform a surgical airway. This group also believed that using the airway checklist would reduce errors during intubation (27, 93.1%) and that the simulated scenarios were beneficial for adopting the use of the checklist (28, 96.6%). Fifty-three participants (98.1%) believed that simulation is beneficial for continuing medical education and 51 respondents (94.4%) thought that skills learned in this simulation were transferable. **Conclusion:** EM practitioners participating in a simulation-based RCT of an airway checklist had positive attitudes towards both the utility of airway checklists and simulation as a learning modality. Thus, simulation may be an effective process to train practitioners to use airway checklists prior to clinical implementation. **Keywords:** checklist, airway, simulation

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Optimizing skill retention in radiograph interpretation: a multicentre randomized control trial

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Introduction: Simulation-based education systems have increased physician skill in radiograph interpretation. However, the degree of skill retention and the factors that influence it are relatively unknown. The main objective of this research was to determine the rate and quantity of skill decay in post-graduate trainee physicians who completed a simulation-based learning intervention of radiograph interpretation. The impact of testing and refresher education on skill decay was also examined. **Methods:** This was a prospective, multicenter, analysis-blinded, four arm randomized control trial conducted from November 2014 to June 2016. Study interventions were administered using an on-line learning and measurement platform. Pediatric and emergency medicine residents in the United States and Canada were eligible for study participation. Participants were randomized to one of four groups. All participants completed an 80-case deliberately practiced learning set of pediatric elbow radiographs followed by an immediate 20-case post-test. Following this, Group 1 had no testing until 12 months; Groups 2, 3, and 4 had testing (20 cases without feedback) every 2 months until 12 months, but Group 3 also had refresher education (20 cases with feedback) at six months while Group 4 had refresher education at two, six, and ten months. The main outcome measure was accuracy at 12 months, adjusted for immediate post-test score, days to completion of 12 month test, and time on case. Based on prior data, we assumed the smallest important difference between groups in learning decay is 10%, a between-participant/within-group standard deviation of 17%, a type I error probability of 5%, a power of 80% and adjusted for three tests with a Bonferroni correction. For the primary analysis of Group 1 versus 2, 3, 4, this resulted in a minimal total sample size of 56, with 14 participants per group. **Results:** We enrolled 106 participants that completed all study interventions. The sample sizes in

Groups 1, 2, 3, and 4 were 42, 22, 22, and 20 respectively. Overall, accuracy increased by 11.8% (95% CI 9.8, 13.8) with the 80-case learning set and then decreased by 5.5% (95% CI 2.5, 8.5) at 12 months. The difference in learning decay in Group 1 vs. Groups 2, 3, 4 was -8.1% (95% CI 2.5, 13.5), $p=0.005$. For Group 2 vs. Group 3 and 4, it was +0.8% (95% CI -7.2, 7.3), $p=0.8$, and between Group 3 vs. Group 4 it was +0.8% (95% CI -7.3, 10.1), $p=0.8$. **Conclusion:** Skill decay was significantly reduced by testing with 20 cases every two months. Refresher education had no additional effect to testing on reducing learning decay. **Keywords:** retention, radiographs, experience curves

LO45

Incidence of delayed intracranial hemorrhage following a mild traumatic brain injury in patients taking anticoagulants or anti-platelets therapies: systematic review and meta-analysis

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Introduction: Head injury is a common presentation to all emergency departments. Previous research has shown that such injuries may be complicated by delayed intracranial hemorrhage (D-ICH) after the initial scan is negative. Exposure to anticoagulant or anti-platelet medications (ACAP) may be a risk factor for D-ICH. We have conducted a systematic review and meta-analysis to determine the incidence of delayed traumatic intracranial hemorrhage in patients taking anticoagulants, anti-platelets or both. **Methods:** The literature search was conducted in March 2017 with an update in April 2017. Keyword and MeSH terms were used to search OVID Medline, Embase and the Cochrane database as well as grey literature sources. All cohort and experimental studies were eligible for selection. Inclusion criteria included pre-injury exposure to oral anticoagulant and / or anti-platelet medication and a negative initial CT scan of the brain (CT1). The primary outcome was delayed intracranial hemorrhage present on repeat CT scan (CT2) within 48 hours of the presentation. Only patients who were rescanned or observed minimally were included. Clinically significant D-ICH were those that required neurosurgery, caused death or necessitated a change in management strategy, such as admission. **Results:** Fifteen primary studies were ultimately identified, comprising a total of 3801 patients. Of this number, 2111 had a control CT scan. 39 cases of D-ICH were identified, with the incidence of D-ICH calculated to be 1.31% (95% CI [0.56, 2.27]). No more than 12 of these patients had a clinically significant D-ICH representing 0.09% (95% CI [0.00, 0.31]). 10 of them were on warfarin and two on aspirin. There were three deaths recorded and three patients needed neurosurgery. **Conclusion:** The relatively low incidence suggests that repeat CT should not be mandatory for patients without ICH on first CT. This is further supported by the negligibly low rate of clinically significant D-ICH. Evidence-based assessments should be utilised to indicate the appropriate discharge plan, with further research required to guide the balance between clinical observation and repeat CT.

Keywords: traumatic brain injury, anticoagulation, delayed intracranial hemorrhage

LO46

Sex-based differences in concussion symptom reporting and self-reported outcomes in a general adult ED population

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Introduction: Patients with concussion frequently present to the emergency department (ED). Studies of athletes and children indicate that concussion symptoms are often more severe and prolonged in females compared with males. To-date, study of sex-based concussion differences in general adult populations have been limited. This study examined sex-based differences in concussion outcomes. **Methods:** Adult (>17 years) patients presenting to one of three urban EDs in Edmonton, Alberta with Glasgow coma scale score 13 within 72 hours of a concussive event were recruited by on-site research assistants. Follow-up calls at 30 and 90 days post ED discharge captured extent of PCS using the Rivermead Post-Concussion questionnaire (RPQ), effect on daily living activities measured by the Rivermead Head Injury Questionnaire (RHQ), and overall health-related quality of life using the 12-item Short Form Health Survey (SF-12). Dichotomous and categorical variables were compared using Fishers exact test; continuous variables were compared using t-tests or Mann-Whitney tests, as appropriate. **Results:** Overall, 130/250 enrolled patients were female. The median age was 35 years; men trended towards being younger (median = 32 years; IQR: 23, 45) than women (median = 40 years; IQR: 22, 52). Compared to women, more men were single (56% vs. 38% (p=0.007) and employed (82% vs. 71% (p=0.055). Men and women experienced different injury mechanisms (p=0.007) with more women reporting injury due to a fall (44% vs. 26%), while more men were injured at work (16% vs. 7%) or due to an assault (11% vs. 3%). Men had a higher return to ED rate (13% vs. 5%; p=0.015). Women had higher RPQ scores at baseline (p<0.001) and 30-day follow-up (p=0.001); this difference was not significant by 90 days (p=0.099). While women reported on the RHQ at 30 days that their injury affected their usual activities significantly more than men (Median = 5, IQR: 0, 11 vs. median = 0.5, IQR: 0.5, 7; p=0.004), both groups had similar scores on the SF-12 physical composite and mental composite scales at all three measurement points. **Conclusion:** In a general ED concussion population, demographic differences exist between men and women. Based on self-reported and objective outcomes, women's usual activities may be more affected by concussion and PCS than men. Further analysis of these differences is required in order to identify different treatment options and ensure adequate care and treatment of injury.

Keywords: concussion, sex-based differences, injury

LO47

Incidence of intracranial bleeding in anticoagulated emergency patients with minor head injury: a meta-analysis

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Introduction: The proportion of Canadians receiving anticoagulation medication is increasing. Falls in the elderly are the most common cause of minor head injury and an increasing proportion of these patients are prescribed anticoagulation. Emergency department (ED) guidelines advise performing a CT head scan for all anticoagulated head injured patients, but the risk of intracranial hemorrhage (ICH) after a minor head injury (patients who have a Glasgow coma score (GSC) of 15) is unclear. We conducted a systematic review and meta-analysis to determine the point incidence of ICH in anticoagulated ED patients presenting with a minor head injury. **Methods:** We systematically searched Pubmed, EMBASE, Cochrane database, DARE, google scholar and conference abstracts (May 2017). Experts were contacted. Meta-Analyses and Systematic Reviews of Observational Studies (MOOSE) guidelines were followed with two authors reviewing titles,

four authors reviewing full text and four authors performing data extraction. We included all prospective studies recruiting consecutive anticoagulated ED patients presenting with a head injury. We obtained additional data from the authors of the included studies on the subset of GCS 15 patients. We performed a meta-analysis to estimate the point incidence of ICH among patients with a GCS score of 15 using a random effects model. **Results:** A total of five studies (and 4,080 GCS 15, anticoagulated patients) from the Netherlands, Italy, France, USA and UK were included in the analysis. One study contributed 2,871 patients. Direct oral anticoagulants were prescribed in only 60 (1.5%) patients. There was significant heterogeneity between studies with regards to mechanism of injury, CT scanning and follow up method (I² = 93%). The random effects pooled incidence of ICH was 8.9% (95% CI 5.0-13.8%). **Conclusion:** We found little data to reflect contemporary anticoagulant prescribing practice. Around 9% of warfarinized patients with a minor head injury develop ICH. Future studies should evaluate the safety of selective CT head scanning in this population.

Keywords: head injury, computed tomography scan, anticoagulation

LO48

Does FAST change management of blunt trauma patients?

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Introduction: Despite widespread use of FAST in trauma, there is a lack of data supporting its usefulness. We sought to identify the impact of FAST on clinical management of blunt trauma patients. **Methods:** This health records review was conducted at a single large academic Level 1 trauma center emergency department. Patients with a suspicion of acute blunt traumatic abdominal injury were identified from our health records database. Data were collected regarding FAST utilization, CT scan utilization and timing, need for definitive management, disposition, and length of stay (LOS). **Results:** 285 patients were included, 152 (53.3%) received a FAST examination, with 33 (22%) having a direct impact on clinical management. CT was performed in 112 (73.6%) of the FAST group, with mean time to imaging of 147.4 minutes, time to trauma team assessment of 21.5 minutes, and ED-LOS of 8.6 hours. In the non-FAST group, 33 (24.8%) received a CT, with time to imaging of 133 minutes, time to trauma team assessment of 133 minutes, and ED-LOS of 13.8 hours. 75.6% of the FAST group required admission and 9.2% required definitive management; admission was needed for 38.3% of the non-FAST group and 2.2% required definitive management. **Conclusion:** This is the first study to assess patient outcomes with respect to FAST in the era of early whole body CT in trauma. Although FAST does not directly impact care for the majority of blunt trauma patients, it demonstrates usefulness in some patients by directing CT utilization and expediting disposition from the ED.

Keywords: focused assessment with sonography for trauma (FAST), blunt abdominal trauma, point of care ultrasound

LO49

Achieving just outcomes: forensic evidence collection in sexual assault cases

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Introduction: Achieving just outcomes in sexual assault cases is one of the most serious and complex problems facing the health care and justice systems. The objectives of this analysis were to determine the