Introduction: Acute aortic dissection (AAD) is a rare but fatal condition where over-investigation and missed diagnosis are common. Our objectives were to derive a highly sensitive clinical risk score for AAD and perform pilot validation. **Methods:** We started with two independent systemic reviews to firstly identify clinical variables associated with AAD and secondly to determine reasons for missed diagnosis. We searched Medline, Embase and the Cochrane database (1968-July 2016). Two reviewers screened articles and extracted data. Agreement was measured by Kappa and study quality by the QUADAS-2 tool. Bivariate random-effects meta-analyses (Revman 5 and SAS 9.3) were performed. Due to sampling bias found in the systematic reviews a matched case control study confirming the strength and direction of predictor variables was performed. The cases (2002-2014) included new emergency department (ED) or in-hospital diagnosis of non-traumatic AAD confirmed by computed tomography (CT). The controls (2010-2011) were a random age/sex matched sample of patients triaged with undifferentiated acute truncal pain (<14 days). Finally, we used the beta coefficients derived from multivariate logistic regression of our case control study to assign a numerical strength of association to predictor variables. To mitigate the bias inherent in case control studies we adjusted the beta coefficient for each variable by the diagnostic odds ratio calculated from each systematic review. Pilot validation was performed on a retrospective sample of all those undergoing CTA to rule out AAD at two tertiary care ED over 12 months. Two abstractors were blinded to the final diagnosis. **Results:** We derived a two-step risk score based on the derivation sample which included 4960 patients(Clinical variables systematic review -9 studies, N = 2400, low risk of bias, Kappa 0.9 & Reasons for missed diagnosis systematic review - 11 studies, N = 800, low-moderate risk of bias, Kappa 0.89 & Case control study -194 AAD, 776 Controls). Step one is a RAPID assessment for AAD 1) Risk factors 2) Alternative diagnosis in the differential that mimics AAD- ACS, PE, Stroke 3) Physical exam- hypotension, pulse deficit 4) Impression- clinical suspicion of AAD and 5) Discomfort-migrating, tearing, pleuritic, thunderclap, severe pain. If any of the above factors are present proceed to step two. Step two stratifies patients based on history (low, moderate, high suspicion), physical exam (hypotension/pulse deficit) and risk factors. In the pilot validation (N = 375,AAD = 16) sensitivity was 100% (95% CI 79.4-100) and specificity 36.5% (95% CI 31.5-41.7%). Patients were successfully stratified into low (<2, 0% AAD), moderate (2, 2.2% AAD), high (>2, 19.6% AAD) and critical probability (>3, 62.5% AAD), with up to 36% reduction in imaging. **Conclusion:** We derived a highly sensitive new clinical risk score with the potential to reduce missed cases of AAD, reduce unnecessary imaging and expedite care.
Keywords: aortic dissection, clinical decision rules

LO33

Do electrocardiogram rhythm findings predict cardiac activity during cardiac arrest? A SHoC series study

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Introduction: Electrocardiographic (ECG) rhythms are used during resuscitation (ACLS) to guide resuscitation, and often to determine futility. Survival rates to hospital discharge have been reported to be higher for patients with PEA than asystole in out-of-hospital cardiac arrest. This study examines how well the initial ECG cardiac rhythm represents actual cardiac activity as determined by point of care ultrasound (PoCUS). **Methods:** A database review was completed for patients arriving to a tertiary ED in asystole or PEA arrest, from 2010 to 2014. Patients under 19y or with a previous DNR were excluded. Patients were grouped into those with cardiac activity (PEA) and asystole on ECG; as well as whether cardiac activity was seen on PoCUS during the arrest. Data was analyzed for visualized cardiac activity on PoCUS. **Results:** 186 patients met the study criteria. Those with asystole on ECG were more likely to have no cardiac activity than those with PEA (Odds 7.21 for initial PoCUS; 5.45 for any PoCUS). The sensitivity of ECG rhythm was 80.49% and 82.12%, specificity was 77.91% and 54.28%, positive predictive value was 94.28% and 88.57%, and negative predictive value was 30.43% and 41.30% for cardiac activity on initial PoCUS and on any PoCUS respectively. The positive and negative likelihood ratios for ECG were 3.47 and 0.25 for activity on initial PoCUS. The positive and negative likelihood ratios for activity on any PoCUS were 1.78 and 0.33. **Conclusion:** Our results suggest that although most patients with asystole on ECG demonstrate no cardiac activity, a small number actually had activity on PoCUS. This supports the use of PoCUS during cardiac arrest, in addition to ECG, to identify patients with ongoing mechanical cardiac activity.
Keywords: cardiac arrest, resuscitation outcomes, electrocardiogram

LO34

Does utilization of an intubation safety checklist reduce dangerous omissions during simulated resuscitation scenarios?

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Introduction: One of the most high-risk tasks regularly performed by emergency medicine (EM) physicians is airway management. Many studies identify an increase in adverse events associated with airway management outside of the operating theatre. Errors of omission are the single most common human error type. To address this risk, the checklist is becoming a common pre-intubation tool. Simulation is a safe setting in which to study the implementation of a new airway checklist. The purpose of this study was to determine if a novel airway checklist decreases practitioners rates of omission of important tasks during simulated resuscitation scenarios. **Methods:** This was a dual-centre, randomized controlled trial of a novel airway checklist utilized by EM practitioners in a simulated environment. The 29-item peri-intubation checklist was derived by experienced EM practitioners following a review of airway checklists in published and gray literature. Participants were EM residents or EM physicians who work more than 20 hours/month in an emergency department. Volunteers were recruited from two academic health centres to complete three simulated scenarios (two requiring intubation, one cricothyroidotomy), and were randomized to either regular care or checklist use. A minimum of two assessors documented the number of omitted tasks deemed important in airway management and the time until definitive airway management. Discrepancies between assessors were resolved by single-assessor video review. **Results:** Fifty-four EM practitioners participated. There was no significant difference in baseline characteristics between the two study groups. The average percentage of omitted tasks over the three scenarios was 45.7% in the control group (n = 25) and 13.5% in the checklist group (n = 29) an absolute difference of 32.2% (95% CI: 27.8%, 36.6%). Time to intubation (normally distributed) was significantly longer in the checklist group for the first two scenarios (mean difference 114.10s, 95% CI: 48.21s, 179.98s and 76.34s, 95% CI:31.35s ,121.33s), but there was no statistical difference in the third scenario where cricothyroidotomy was required (mean difference 33.75s, 95% CI: -28.14s, 95.65s). **Conclusion:** In a simulated setting, use of an airway

checklist significantly decreased the omission rate of important airway management tasks, however it increased the time to definitive airway management. Further study is required to determine if these findings are consistent in a clinical setting and how they impact the rate of adverse events.

Keywords: checklist, airway, simulation

LO35

Improving the precision of emergency physicians diagnosis of stroke and TIA

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Introduction: Studies suggest that there is a significant discrepancy between emergency physicians diagnosis of TIA and confirmation by neurologists. The objectives of our study were to identify factors associated with neurologists confirmation of TIA in patients referred from the emergency department. **Methods:** Data were obtained from a prospective cohort study across more than 8 university-affiliated Canadian hospitals from 2006-2017 of adult patients diagnosed with a TIA or non-disabling stroke in the ED. Patients presenting after 1 week of symptom onset, receiving TPA as part of a stroke code, with a GCS < 15 at baseline, and without a neurology assessment within 90 days were excluded. Univariate analyses were performed with t-tests or chi-square tests as indicated. Multivariate analysis with backward elimination was performed to identify unique predictors of TIA confirmation. **Results:** Of 8,669 patients diagnosed with TIA in the ED, 7,836 (90%) were assessed by neurology. The mean age of patients was 68.2 years and 71.1% presented with their first ever TIA. The rate of confirmation of TIA by neurology was 56%. The most common alternate diagnoses included migraines (26%), peripheral vertigo (10%), syncope (6%), and seizure (4%). The 3 strongest predictors of confirmation of TIA were infarct on imaging (OR 2.31, 2.03-2.63), history of weakness (OR 2.19, 1.95-2.48), and history of language disturbance (OR 2.05, 1.79-2.34). The 3 strongest predictors of an alternate diagnosis were syncope (OR 0.51, 0.39-0.67), history of bilateral weakness (or 0.51, 0.31-0.84), and confusion (OR 0.57, 0.48-0.67). **Conclusion:** The rate of TIA confirmation by neurology in our study was 56%. Emergency physicians should have a high index of suspicion of TIA in patients with history of weakness and language disturbance, and should resist referring to a stroke prevention clinic, patients with syncope, bilateral findings, or confusion.

Keywords: transient ischemic attack, stroke, diagnosis

LO36

The state of advocacy in postgraduate medical education: a literature review

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Introduction: Health advocacy training is an important part of emergency medicine practice and education. There is little agreement, however, about how advocacy should be taught and evaluated in the postgraduate context, and there is no consolidated evidence-base to guide the design and implementation of post-graduate health advocacy curricula. This literature review aims to identify existing models used for teaching and evaluating advocacy training, and to integrate these findings with current best-practices in medical education to develop practical, generalizable recommendations for those involved in the design of postgraduate advocacy training programs. **Methods:** Ovid MEDLINE and PubMed searches combined both MeSH and non-MeSH variations on advocacy and internship and residency. Forward snow-balling that incorporated grey literature searches from accreditation agencies, residency websites and reports were included. Articles were excluded if unrelated to advocacy and postgraduate medical education. **Results:** 507 articles were identified in the search. A total of 108 peer reviewed articles and 38 grey literature resources were included in the final analysis. Results show that many regulatory bodies and residency programs integrate advocacy training into their mission statements and curricula, but they are not prescriptive about training methods or assessment strategies. Barriers to advocacy training were identified, most notably confusion about the definition of the advocate role and a lower value placed on advocacy by trainees and educators. Common training methods included didactic modules, standardized patient encounters, and clinical exposure to vulnerable populations. Longitudinal exposure was less common but appeared the most promising, often linked to scholarly or policy objectives. **Conclusion:** This review indicates that postgraduate medical education advocacy curricula are largely designed in an ad-hoc fashion with little consistency across programs even within a given discipline. Longitudinal curriculum design appears to engage residents and allows for achievement of stated outcomes. Residency program directors from emergency medicine and other specialties may benefit from promising models in pediatrics, and a shared portal with access to advocacy curricula and the opportunity to exchange ideas related to curriculum design and implementation.

Keywords: advocacy, education

LO37

Barriers and enablers to direct observation of clinical performance a qualitative study using the theoretical domains framework

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Introduction: Direct observation is essential to assess medical trainees and provide them with feedback to support their progression from novice to competent physicians. However, learners consistently report infrequent observations, and calls to increase direct observation in medical training abound. In this study, a theory-driven approach using the Theoretical Domains Framework (TDF) was applied to systematically investigate factors that serve as barriers and enablers to direct observation in residency training. **Methods:** Semi-structured interviews of faculty and residents from various specialties at two large tertiary-care teaching hospitals were conducted. An interview guide based on the TDF was used to capture 14 theoretical domains that may influence direct observation. Interview transcripts were independently coded using direct content analysis by two researchers, and specific beliefs were generated by grouping similar responses. Relevant domains were identified based on the frequencies of beliefs reported, presence of conflicting beliefs, and perceived influence on direct observation practices. **Results:** Data saturation was achieved after 12 resident and 13 faculty interviews, with a total of 10 different specialties represented. Median postgraduate year among residents was 4 (range 1-6), and mean years of independent practice among faculty was 10.3 (SD = 8.6). Ten TDF domains were identified as influencing direct observation: knowledge, skills, beliefs about consequences, social professional role and identity, intention, goals, memory/attention/decision-making, environmental context and resources, social influences, and behavioural regulation. Discord between faculty and resident intentions to engage in