

low back pain could be reduced by 28 per 100 patients using a model that incorporates sex, age >65, and trauma. **Conclusion:** Serious low back pathology is extremely rare in patients presenting with low back pain. Combinations of red flags readily available in emergency departments have the potential to reduce unnecessary imaging tests.

Keywords: low back pain, diagnostic imaging, red flags

LO76

Can emergency physicians perform carotid artery ultrasound to detect severe stenosis in patients with TIA and stroke?

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Introduction: Carotid artery stenosis (CAS) is a common cause of stroke. Patients with severe, symptomatic CAS can have their subsequent stroke risk reduced by carotid endarterectomy or stenting when completed soon after a TIA or non-disabling stroke. Patients presenting to a peripheral ED with TIA/stroke, may require transfer to another hospital for imaging to rule-out CAS. The purpose of this study was to determine the test characteristics of carotid artery POCUS in detecting greater than 50% stenosis in patients presenting with TIA/stroke. **Methods:** We conducted a prospective cohort study on a convenience sample of adult patients presenting to a tertiary care academic ED with TIA/stroke between June and October 2017. Carotid POCUS was performed by a trained medical student or a trained emergency physician. Our outcome measure, CAS >50% was determined by the final radiology report of CTA imaging by a trained radiologist, blinded to our study. A blinded POCUS expert reviewed the carotid POCUS scans. We calculated the sensitivity and specificity for CAS >50% using carotid POCUS versus the gold standard of CTA. **Results:** We enrolled 75 patients of which 5 did not meet inclusion criteria. The mean age was 70.4 years, 57% were male. 16% were diagnosed with greater than 50% CAS. 47% were stroke codes and 37% were admitted to hospital. Carotid POCUS had a sensitivity and specificity of 72% (46%-99%) and 88% (80%-96%) respectively. There were three false negatives of which two were exactly 50% ICA stenosis on CTA and the other was 100% occlusion of the distal ICA. Kappa coefficient for inter-rater reliability between standard and expert interpretation was 0.68 for moderate agreement. The scan took a mean time of 6.2 minutes to complete. **Conclusion:** Carotid POCUS has moderate correlation with CTA for detection of CAS greater than 50%. Carotid POCUS identified all the critical 70-99% stenosis lesions that would need urgent surgery. Further research is needed to confirm these findings.

Keywords: stroke, point-of-care ultrasound, transient ischemic attack

LO77

Predictors of adverse self-reported 10-day outcomes in emergency department patients with acute ureteral colic

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Introduction: Our objective is to investigate predictors of adverse patient reported outcomes during the 10 days after an index emergency department (ED) encounter for ureteral colic. **Methods:** This prospective two-city patient experience survey enrolled ED patients with confirmed 2-10 mm ureteric stones. Researchers telephoned consenting patients 10 days post-ED visit and assessed quality of life (QoL) using

survey items from the VR-12 Health Outcome Survey. We used five survey items and three other variables to derive a composite measure of patient adverse experience (AE). The association between patient characteristics, symptoms and perceptions of care with outcome was determined using multiple logistic regression. **Results:** Of 224 patients studied (68% male, mean age 52 years) 154 (68.8%) indicated that one or more of the following AEs occurred during their 10 day followup interval: 103 (46%) reported that the impact of pain on their life was >4/10; 87 (39%) described poor or fair health status; 83 (37%) required >7 days for return of normal function; 66 (27.7%) had >2 severe pain episodes per day; 62 (27.7%) required ED revisit or hospitalization; 47 (21%) found usual activities were limited most or all the time; 45 (20%) required >2 opioid doses/day; and 24 (10.7%) lost >7 work days. A composite measure derived from 3 survey items (days to normal, pain impact, health status) captured 92% of patients with adverse experiences. On multivariable logistic regression modeling, the strongest predictors of adverse (composite) outcome were male sex (adjusted OR = 0.44; CI, 0.22-0.85), (excellent) quality of physician answers (OR = 0.40; CI, 0.2-0.77), proximal or mid-ureteric stone (OR = 1.9; CI, 1.1-3.5), arrival pain severity (OR = 1.18 per unit increase; CI, 1.01-1.4), and perceived physician skill (OR = 0.81; CI, 0.65-1.0). Patient age, stone size, pain duration, nausea, discharge pain and perceived ED care quality were not independent predictors of 10-day adverse patient experience in multivariate models. **Conclusion:** Patient sex, quality of physician communication, patient sex, arrival pain severity, and proximal stone location are highly associated with 10-day patient reported AE.

Keywords: renal colic, patient adverse experiences, quality of life

LO78

Point-of-care ultrasound compared with manual palpation for the detection of a carotid pulse in live models: a randomized cross-over study

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Introduction: Pulse check by manual palpation (MP) is an unreliable skill even in the hands of healthcare professionals. In the context of cardiac arrest, this may translate into inappropriate chest compressions when a pulse is present, or conversely omitting chest compressions when one is absent. To date, no study has assessed the utility of B-mode ultrasound (US) for the detection of a carotid pulse. The primary objective of this study is to assess the time required to detect a carotid pulse in live subjects using US compared to the standard MP method. **Methods:** This is a prospective randomized controlled cross-over non-inferiority trial. Health care professionals from various backgrounds were invited to participate. They attended a 15 minute focused US workshop on identification of the carotid pulse. Following a washout period, they were randomized to detect a pulse in live subjects either by MP first or by US first. Both pulse check methods were timed for each participant on 2 different subjects. The primary outcome measure was time to carotid pulse detection in seconds. Secondary outcome measures included comfort levels of carotid pulse detection measured on a 100mm visual analog scale (VAS), and rates of prolonged pulse checks (greater than 5 or 10 seconds) for each technique. Mean pulse detection times were compared using Students t-test. The study was powered to determine whether US was not slower than MP by greater than 2 seconds. **Results:** A total of 93 participants completed the study. Time to detect pulse was 4.2 (SD = 3.4) seconds by US compared with 4.7 (SD = 6.5) seconds by MP (P = 0.43). Seventeen (18%) participants took >5 seconds to identify the carotid pulse using US compared to 19 (20%) by MP (P = 0.74). Eight (9%) candidates took >10 seconds to

identify the pulse using US compared to 9 (10%) by MP ($P=0.81$). Prior to training, participants had a higher comfort level using MP than US pulse checks (67 vs. 26 mm, $P<0.001$). Following the study, participants reported higher comfort levels using US than MP (88 vs. 78 mm, $P<0.001$). **Conclusion:** Carotid pulse detection in live subjects was not slower using US as compared to MP in this study. A brief teaching session was sufficient to improve confidence of carotid pulse identification even in those with little to no previous US training. The preliminary results from this study provide the groundwork for larger studies to evaluate this pulse check method for patients in actual cardiac arrest.

Keywords: ultrasound, pulse, palpation

LO79

Climbing the learning curve teaching the pediatric emergency physician how to interpret point-of-care ultrasound images

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Introduction: Point-of-Care Ultrasound (POCUS) is rapidly being integrated into Pediatric Emergency Medicine (PEM), and image interpretation is an important component of this skill. Currently, PEM physicians often rely on case-by-case exposure and feedback by a POCUS expert physician to learn this skill; however, this may not be efficient, reliable or feasible. Thus, there is a pressing need to develop effective POCUS image interpretation learning and assessment tools. We developed an on-line learning platform that allowed for the deliberate practice of images in four POCUS applications [soft tissue, lung, cardiac and Focused Assessment Sonography for Trauma (FAST)], and determined the quantity of participant skill acquisition by deriving performance metrics and learning curves. **Methods:** This was a prospective cross-sectional study administered via an on-line learning and measurement platform. Images were acquired from a pediatric emergency department and each POCUS application contained 100 still/video images. Final diagnosis of each image was determined via the consensus of three PEM POCUS experts. PEM fellow and attending study participants were recruited from the USA and Canada and were required to complete the cases of at least one application. We aimed to enroll 200 participants who had to complete a minimum of 100 cases which, based on prior work, would provide sufficient raters for item analyses and comparisons between PEM attendings and fellows. To derive reference standard performance metrics and to validate image interpretations, a unique set of five PEM POCUS experts completed each application. **Results:** We enrolled 225 PEM physicians, 74 fellows and 151 attendings. For all applications, the Cohens d effect size was large at 0.87, and there was no difference between PEM attendings and fellows with respect to summary performance metrics (accuracy, $p = 0.29$; sensitivity, $p = 0.13$; specificity, $p = 0.92$). Final accuracy soft tissue, lung, cardiac, and FAST for all participants was 86.4%, 89.6%, 81.6%, 88.0%, respectively, and the corresponding accuracy of PEM POCUS experts for each application was 96.0%, 96.0%, 90.0%, and 93.0%. Learning curves show maximal learning gains (inflection point) up until 65 cases for soft tissue, 70 for FAST, 75 for lung, and 85 for cardiac. **Conclusion:** Deliberate practice of POCUS image interpretation was effective for ensuring broad domain coverage and predictable skill improvement. Specifically, there was a large learning effect after 100 case interpretations, and 65-85 case interpretations were needed to reach an accuracy threshold of approximately 85%.

Keywords: medical education, diagnosis, learning

LO80

Ondansetron administration to non-dehydrated children with acute gastroenteritis-associated vomiting, in emergency departments in Pakistan: a randomized, blinded, phase 3, superiority trial

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Introduction: In high-income countries, vomiting often impedes oral rehydration therapy, leading to intravenous rehydration fluid administration to children with acute gastroenteritis. Ondansetron administration reduces vomiting and intravenous fluid administration in this population. We evaluated whether ondansetron is similarly effective when employed in Pakistan. **Methods:** In this 2-hospital, double-blind, placebo-controlled, emergency department-based, randomized trial, we recruited children aged 0-5 to 5-0 years, without dehydration, who had diarrhea and 1 episode of vomiting within 4 hours of arrival. Patients were randomly assigned (1:1), via an internet-based randomization service, using a stratified, variable block randomization scheme, to receive a single dose of oral ondansetron or placebo. The primary endpoint was intravenous rehydration (administration of 20 ml/kg over 4 hours of an isotonic fluid) within 72 hours of randomization. All randomized children were analysed. **Results:** From July 3, 2014, to January 12, 2017, 626 children were randomized. Intravenous rehydration was provided to 10.8% (34/314) and 10.3% (27/312) of children administered placebo and ondansetron, respectively (OR: 0.946; 95% CI: 0.564, 1.587; $P=0.834$). A regression model fitted with treatment group and adjusted for antiemetic administration and vomiting frequency in the preceding 24 hours, yielded similar results; OR = 0.952; 95% CI: 0.570, 1.589; $P=0.850$. There was no evidence of interaction between treatment group and age ($P=0.974$), 3 diarrheal stools in the preceding 24 hours ($P=0.983$) or 3 vomits in the preceding 24 hours ($P=0.554$). During the 4-hour study observation period, 24.0% (75/314) and 19.6% (61/312) of children in the placebo and ondansetron groups vomited, respectively; OR: 0.774; 95% CI: 0.528, 1.133; $P=0.187$. **Conclusion:** Ondansetron administration did not significantly reduce intravenous rehydration use, suggesting that in children without dehydration, ondansetron administration does not significantly alter the disease course and should not be administered to this group of children.

Keywords: ondansetron, vomiting, gastroenteritis

LO81

Bridging the GAP: A deliberate practice method for learning genital abnormalities in prepubescent girls

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Introduction: Correctly identifying pathology in pre-pubertal females is a high-stakes physical examination skill. Currently, learning this skill relies heavily on case-by-case exposure, which is variable, limited and often results in suboptimal skill. Thus, there is a need to develop and evaluate learning platforms that simulate the presentation and diagnosis of this important clinical task. We developed an on-line learning and assessment platform that allowed the deliberate practice of 158 pre-pubertal female genital image interpretations. We examined the quantity of skill acquisition by deriving performance metrics and learning curves. **Methods:** This was a prospective cross-sectional study administered via an on-line learning and assessment platform. Colposcopic images were acquired from a child abuse clinic. Two child abuse experts