percutaneous coronary intervention site in Calgary, Alberta. Patients were eligible for enrolment if they presented to the ED with chest pain, were 25-years or older and required biomarker testing to rule out AMI at the discretion of the attending emergency physician. Patients were excluded if they had clear acute ischemic ECG changes, new arrhythmia or renal failure requiring hemodialysis. A high-sensitivity troponin result (Roche Elecsys hs-cTnT) was obtained in all patients at presentation. The primary outcome was AMI on the index visit. Secondary outcomes included 30-day AMI and major adverse cardiac events (MACE - including AMI, revascularization or cardiac death). Electronic medical records were reviewed and telephone follow-up was obtained for all patients at 30-days to ensure relevant events were captured. Two physician adjudication (board-certified emergency physician and cardiologist) was obtained for all outcomes. This study was REB approved. **Results:** A total of 1,167 patients were enrolled from August 2014 September 2016, of which 191 (16.3%) patients had an initial troponin below the limit of blank (LoB, <3 ng/L) and 416 (32.8%) were below the limit of detection (LoD, <5 ng/L). The sensitivity of a single troponin below the LoB (<3 ng/L) for index AMI was 100% (95% CI 96.2%-100%) and for 30-day AMI was 100% (95% CI 96.4-100%). The sensitivity of a troponin below the LoD (<5 ng/L) for index AMI was 97.9% (95% CI 92.7%-99.8%) and for 30-day AMI was 98.0% (95% CI 93.0-99.8%). Sensitivity for 30-day MACE at both cutoffs was lower: 98.4% (95% CI 94.3-99.8%) for <3 ng/L, and 94.4% (95% CI 88.8-97.7%) for <5 ng/L, respectively; however, negative predictive values remained high at both cutoffs: <3 ng/L, 99.0% (95% CI 96.3-99.9%) and <5 ng/L, 98.3% (95% CI 96.6-99.3%). **Conclusion:** A high sensitivity troponin T result below the LoB (<3 ng/L) is highly sensitive for excluding AMI and identifies patients at low risk of 30-day MACE. A result below the LoB (<5 ng/L) will identify a larger population of patients as low risk but has a greater risk of missed AMI and MACE.
Keywords: high-sensitivity troponin, acute myocardial infarction, chest pain

LO58

Long-term outcomes among emergency department syncope patients: a systematic review

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Introduction: Approximately 50% of patients discharged from the Emergency Department (ED) after syncope have no cause found. Long-term outcomes among syncope patients are not well studied, to guide physicians regarding outpatient testing and follow-up. The objective of this study was to conduct a systematic review for long-term (one year) outcomes among ED patients with syncope. We aim to use the results of this review to guide us in prospective analysis of one year outcomes with our large database of syncope patients. **Methods:** We searched Cochrane Central Register of Controlled Trials, Medline and Medline in Process, PubMed, Embase, and the Cumulative Index to Nursing and Allied Health Literature (CINAHL) from the inception to June, 2017. We included studies that reported long-term outcomes among adult ED patients (16 years or older) with syncope. We excluded studies on pediatric patients, and studies that included syncope mimickers: pre-syncope, seizure, intoxication, loss of consciousness after head trauma. We also excluded case reports, letters to the editor and review articles. Outcomes included death, syncope recurrence requiring hospitalization, arrhythmias and procedural interventions for arrhythmias. We selected articles based on title and abstract review during phase-1 and conducted full article review during phase-2. Meta-analysis was performed by pooling the outcomes using random effects model (RevMan v.5.3; Cochrane Collaboration). **Results:** Initial literature search generated 2094 articles after duplicate removal. 50 articles remained after phase-1 (=0.85) and 16 articles were included in the systematic review after phase-2 (=0.86). The 16 included studies enrolled a total of 44,755 patients. Pooled analysis at 1-year follow-up showed the following outcomes: 7% mortality; 14% recurrence of syncope requiring hospitalization; one study reported that 0.6% of patients had a pacemaker inserted; and two studies reported 0.8 11.5% of patients suffered new arrhythmias. **Conclusion:** An important proportion of ED patients with syncope suffer outcomes at 1-year. Appropriate follow-up is needed to prevent long-term adverse outcomes. Further prospective research to identify patients at risk for long-term important cardiac outcomes and death is needed.
Keywords: syncope, long-term outcomes, mortality

LO59

External validation of a 2-hour rapid diagnostic algorithm for ruling out acute myocardial infarction in emergency department patients with chest pain using a high-sensitivity troponin-T assay

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Introduction: Ruling out acute myocardial infarction (AMI) using serial troponin testing is central to the care of many emergency department (ED) patients with chest pain. While diagnostic strategies using conventional troponin assays require repeat sampling over many hours to avoid missed diagnoses, serial high-sensitivity troponin (hs-cTn) assays may be able to exclude AMI in most patients within 1 or 2 hours. However, many of the initial studies deriving and validating these rapid diagnostic algorithms had all hs-cTn samples analyzed in a central core lab likely representing optimal assay performance. This objective of this study is to validate a 2-hour rapid diagnostic algorithm to exclude AMI in ED chest pain patients using an hs-cTn assay in real world practice. **Methods:** This prospective cohort study was conducted at a single urban tertiary center and regional percutaneous coronary intervention site in Calgary, Alberta. Patients were eligible for enrolment if they presented to the ED with chest pain, were 25-years or older and required biomarker testing to rule out AMI at the discretion of the attending emergency physician. Patients were excluded if they had clear acute ischemic ECG changes, new arrhythmia or renal failure requiring hemodialysis. A high-sensitivity troponin result (Roche Elecsys hs-cTnT) was obtained in all patients at ED presentation and 2-hours later. The primary outcome was AMI on the index visit. Secondary outcomes included 30-day AMI and 30-day major adverse cardiac events (MACE - including AMI, revascularization or cardiac death). Electronic medical records were reviewed and telephone follow-up was obtained for all patients at 30-days to ensure relevant events were captured. Two physician adjudication (board-certified emergency physician and cardiologist) was obtained for all outcomes. This study was REB approved. **Results:** A total of 549 patients were enrolled from August 2014 September 2016 with 2-hour serial hs-cTnT results, of which 349 (63.6%) met the 2-hour rapid diagnostic algorithm low risk criteria (time 0 h/2 h hs-cTnT <14 ng/L and delta 2 h <4 ng/L). The sensitivity of the 2-hour low risk criteria for index AMI was 98.4% (95% CI 91.3%-100%) and for 30-day AMI was 98.4% (95% CI 91.6-100%). The sensitivity for 30day MACE was lower 84.4% (95% CI 74.4-91.7%) but maintained a high negative predictive value, 96.6% (95% CI 94.1-98.2%). **Conclusion:** A 2-hour rapid diagnostic algorithm using an hs-cTnT assay was highly sensitive for AMI on the index visit and successfully

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identified patients at low risk of 30-day AMI. Sensitivity for MACE was lower, reminding us that while biomarker-only rapid diagnostic algorithms excel at ruling out AMI, careful clinical risk stratification is needed to avoid missed MACE events.
Keywords: high-sensitivity troponin, myocardial infarction, rapid diagnostic algorithm

LO60

Diagnostic utility of creatine kinase in the diagnosis and management of non-ST elevation myocardial infarction

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Introduction: Creatine kinase (CK) measurement, despite not being recommended for the diagnosis of a Non-ST Elevation Myocardial Infarction (NSTEMI) is still routinely performed in the emergency department (ED) for the workup of NSTEMI. The diagnostic utility of CK among ED patients with suspected NSTEMI is still not well understood. The objectives of this study were to assess: the additional value of CK in NSTEMI diagnosis and the correlation between the highest CK/TNI values and ejection fraction (EF) on follow-up echocardiography among patients with suspected NSTEMI. **Methods:** This was a prospective cohort study conducted at the Civic and General Campuses of The Ottawa Hospital from March 2014 to March 2016. We enrolled adults (18 years) for whom troponin (TNI) and CK were ordered for chest pain or non-chest pain symptoms within the past 24 hours concerning for NSTEMI and excluded those with suspected ST-Elevation Myocardial Infarction (STEMI). Primary outcome was a 30-day NSTEMI adjudicated by two blinded physicians. Demographics, medical history, and ED CK/TNI values were collected. We used descriptive statistics and report test diagnostic characteristics. **Results:** Of the 1,663 patients enrolled, 84 patients (5.1%) suffered NSTEMI. The sensitivity and specificity of CK was 30.9% (95% CI 21.1, 40.8) and 91.4% (95% CI 90.0, 92.8) respectively. The sensitivity and specificity of troponin was 96.4% (95% CI 92.4, 100) and 88.1% (95% CI 86.5, 89.7) respectively. Among 3 (0.2%) patients with missed NSTEMI diagnosis with TNI, CK measurements did not add value. The mean CK values were not significantly different between those with normal and abnormal EF on follow-up (132.4 U/L and 146.3 U/L respectively; $p = 0.44$), whereas the mean TNI values were significantly different (0.5 µg/L and 1.3 µg/L respectively; $p = 0.046$). **Conclusion:** CK measurements neither provide any additional value in the work-up of NSTEMI in the ED nor correlate with EF on follow-up. Discontinuing routine CK measurements would reduce overall costs and improve resource utilization in the ED, and streamline the management of patients in the ED with chest pain.
Keywords: chest pain, creatine kinase, non-ST elevated myocardial infarction

LO61

Test characteristics of high sensitivity troponin T performed at emergency department arrival for acute myocardial infarction in patients with reduced kidney function

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Introduction: Patients with chronic kidney disease (CKD) are at high risk of cardiovascular events, and have worse outcomes following acute myocardial infarction (AMI). Cardiac troponin is often elevated in CKD, making the diagnosis of AMI challenging in this population. We sought to quantify test characteristics for AMI of a high-sensitivity troponin T (hsTnT) assay performed at emergency department (ED) arrival in CKD patients with chest pain, and to derive rule-out cutoffs specific to patient subgroups stratified by estimated glomerular filtration rate (eGFR). We also quantified the sensitivity and classification performance of the assays limit of detection (5 ng/L) and the FDA-approved limit of quantitation (6 ng/L) for ruling out AMI at ED arrival. **Methods:** Consecutive patients in four urban EDs from the 2013 calendar year with suspected cardiac chest pain who had a Roche Elecsys hsTnT assay performed on arrival were included f. This analysis was restricted to patients with an eGFR <60 ml/min/1.73m2. The primary outcome was 7-day AMI. Secondary outcomes included major adverse cardiac events (death, AMI and revascularization). Test characteristics were calculated and ROC curves were generated for eGFR subgroups. **Results:** 1416 patients were included. 7-day AMI incidence was 10.1%. 73% of patients had an initial hsTnT concentration greater than the assays 99th percentile (14 ng/L). TCurrently accepted cutoffs to rule out MI at ED arrival (5 ng/L and 6 ng/L) had 100% sensitivity for AMI, but no patients with an eGFR less than 30 ml/min/1.73M had hsTnT concentrations below these thresholds. We derived eGFR-adjusted cutoffs to rule out MI with sensitivity >98% at ED arrival, which were able to rule out 6-42% of patients, depending on eGFR category. The proportion of patients able to be accurately ruled-in with a single hsTnT assay was substantially lower among patients with an eGFR <30 ml/min/1.73m2 (6-20% vs. 25-43%). We also derived eGFR-adjusted cutoffs to rule-in AMI with specificity >90%, which accurately ruled-in up to 18% of patients. **Conclusion:** Cutoffs achieving acceptable diagnostic performance for AMI using single hsTnT sampling on ED arrival may have limited clinical utility, particularly among patients with very low eGFR. The ideal diagnostic strategy for AMI in patients with CKD likely involves serial high-sensitivity troponin testing with diagnostic thresholds customized to different eGFR categories.
Keywords: myocardial infarction, troponin, kidney disease

LO62

Variability in triage performance for chest pain patients in two Canadian cities

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Introduction: CTAS triage acuity determinations are used to prioritize patients, describe illness acuity, and compare casemix across institutions. The latter functions assume reliable application in diverse settings, but no studies have evaluated this using actual triage data. **Methods:** This administrative database study included all patients with a triage complaint of chest pain (CP) in Vancouver (2012-16) and Calgary (2016). We stratified patients into high vs. non-high severity groups based on discharge diagnoses. High severity diagnoses included all patients with aortic pathology, ACS, shock or arrest states, as well as patients requiring admission because of pulmonary embolism, dysrhythmias, CHF, neurologic or respiratory conditions. We dichotomized patient triage assignments to high (CTAS 1,2) vs. low (3,4,5) acuity, then constructed 2x2 tables correlating CTAS acuity with disease severity. Main outcomes included the proportion of CP patients triaged to high acuity categories and CTAS sensitivity for high severity conditions. **Results:** We studied 97,277 Vancouver and 18,622 Calgary patients. Age (mean, 54.8 years), sex (53.5% male) and casemix