

routine ED care. Machine learning tools may potentially be used to help ED physicians to make faster and more appropriate disposition decisions, to decrease unnecessary testing and alleviate ED crowding. **Keywords:** artificial intelligence, emergency department crowding, emergency department disposition

LO33

Sharing and teaching electrocardiograms to minimize infarction

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Background: Every 30-minute delay to ST-Elevation Myocardial Infarction (STEMI) reperfusion increases one-year mortality by 7.5%. A local audit found that the third of patient electrocardiograms (ECGs) not initially meeting classic STEMI criteria had an ECG-to-Activation (ETA) time of over 90 minutes, more than five times that of classic STEMIs. However, three quarters of "STEMI negative" ECGs met STEMI-equivalent patterns or rules for subtle occlusion, uncovering an opportunity for improvement. **Aim Statement:** We aimed to reduce ETA time, from initial emergency department (ED) ECG to activation of the cath lab, for patients whose ECGs did not meet classic STEMI criteria, by 30 minutes within one year (i.e. by Dec 2019). **Measures & Design:** We reviewed all ED Code STEMIs over a 35-month pre-intervention period. Root Cause analyses, including Ishikawa diagram and Pareto chart, led to our Plan-Do-Study-Act cycles: 1) a survey to engage our team; 2) a Grand Rounds presentation as an educational strategy; and 3) weekly web-based feedback to all ED physicians on STEMI-equivalents and subtle occlusions, using recent local cases. Our outcome measures were ETA times, stratified by ECGs not initially meeting STEMI criteria (primary) and those that did (secondary). Our process measures were the number of website visits and page views. Our balancing measure was the proportion of Code STEMIs without culprit lesion. We used Statistical Process Control (SPC) charts with usual special cause variation rules. **Evaluation/Results:** ETA time for the 37.5% of 56 ECGs that did not meet classic STEMI criteria decreased from 97.5 to 53.7 minutes (min), a 43.8-min absolute decrease ($p = 0.037$), while those meeting STEMI criteria remained the same (16.5 to 18.2 min, $p = 0.75$). SPC charts did not show special cause variation. There were 2,634 page views (65.9/week) and 1,092 visits (27.3/week), in a group of 80 physicians—i.e. a third of the group each week. There was no change in Code STEMIs without culprit lesions (28.0 % to 23.3%, $p = 0.41$). **Discussion/Impact:** We reduced ETA time by 43.8 min for the one third of patients with culprit lesions not initially meeting classic STEMI criteria, a magnitude associated with mortality impact. To do so, we used a multi-modal educational strategy including a novel web-based feedback approach to all ED physicians. Local feedback and education on this challenging-to-diagnose subgroup, guided by ETA time as a quality metric, could be replicated in other centres.

Keywords: electrocardiogram, quality improvement and patient safety, ST elevation myocardial infarction

LO35

A province-wide quality improvement collaborative for treatment of children's pain in Alberta's emergency departments

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Background: Pediatric pain is often under-treated in emergency departments (EDs), causing short and long-term harm. In Alberta EDs, children's pain outcomes were unknown. A recent quality improvement collaborative (QIC) led by our team improved children's pain care in 4 urban EDs. We then spread to all EDs in Alberta using the Institute for Healthcare Improvement Framework for Going to Full Scale. **Aim Statement:** To increase the proportion of children <12 years who receive topical anesthetic before needle procedures from 11% to 50%; and for children <17 years with fractures: to 1) increase the proportion receiving analgesia from 31% to 50%; 2) increase the proportion with pain score documentation from 24% to 50%, and 3) reduce time to analgesia from 60 to 30 minutes, within 1 year. **Measures & Design:** All 97 EDs in Alberta that treat children were invited. Each was asked to form a project team, attend webinars, develop key driver diagrams and perform PDSA tests of change. Sites were given a monthly list of randomly selected charts for audit and entered data in REDCap for upload to a provincial run chart dashboard. Baseline performance measurement informed aims. Measures included proportion of children <12 years undergoing a lab test who received topical anesthetic, and for children <17 years with fracture, the proportion with a pain score, proportion receiving analgesia and median minutes to analgesia. Length of stay and use of opioids were balancing measures. Control charts were used to detect special cause. Interrupted time series (ITS) was performed to assess significance and trends. **Evaluation/Results:** 36 sites (37%) participated, including rural and urban sites from all regions. 8417 visits were audited. 23/36 sites completed audits before and after tests of change and were analyzed. Special cause occurred for all aims. The proportion receiving topical anesthetic increased from 11% to 30% (ITS $p < 0.001$). For children with fractures, the proportion with pain scores increased from 24% to 34% (ITS $p = 0.21$, underlying trend present), proportion receiving analgesic medication increased from 31% to 39% (ITS $p = 0.41$, underlying trend present) and minutes to analgesia decreased from 60 to 28 (ITS $p < 0.01$). There was no increase in length of stay or use of opioid medications. **Discussion/Impact:** A pragmatic approach encouraging locally led change was well-received and key to success. The QIC method shows promise for improving outcomes in diverse EDs across large geographic areas. Next steps include further spread and sustainability measurement.

Keywords: pain, pediatric, quality improvement and patient safety

LO36

Reducing emergency department bloodwork and eliminating waste

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Background: Patients presenting to the Emergency Department (ED) may be subjected to unnecessary bloodwork. This leads to excessive work for front-line nurses, physicians and laboratory staff, contributing to increased ED length of stay (LOS), patient discomfort, and health care costs. **Aim Statement:** By January 1, 2020, we will reduce the number of targeted blood tests (AST, GGT, aPTT and CK) by 40% in the Mount Sinai ED, as measured by the percent per 1000 ED visits of AST to ALT, GGT to ALT, aPTT to INR and CK to troponin. **Measures & Design:** This was a prospective time series quality improvement study. Using the Model for Improvement, we engaged front-line ED staff, as well as stakeholders from