

| Sample groups of ESI-3 patients who could be sent to the low-acuity area | | | | | | | | | |
|--|-------|--------|-------------|--------------|------------|-------------|------------|-------|------------------|
| Chief Complaint | Age | Gender | Systolic BP | Diastolic BP | Pulse Rate | Temperature | Resp. Rate | SpO2 | Means of arrival |
| Chest Pain | 25-35 | M/F | <189 | - | <77 | <99.4 | 17-21 | - | Self |
| Cough | - | M/F | <155 | - | 81-89 | - | - | 93-95 | - |
| Dizziness | 25-36 | M | >=143 | - | <92 | - | - | >=99 | - |
| Dysuria | <75 | M | - | - | <84 | - | >=17 | >=97 | - |
| Dysuria | <75 | F | - | - | 81-106 | - | >=17 | >=97 | - |
| Dysuria | <42 | M/F | - | <97 | <77 | - | <17 | - | - |
| Hematuria | <25 | M/F | <186 | <106 | - | <99.9 | <18 | <99 | Self |
| Shortness of Breath | <33 | M | - | <112 | <95 | <98.9 | - | - | - |

Table 292: Torabi.

Methods: We extracted demographics, vital sign, and chief complaint data from the electronic medical record for 115,000 patient visits over 18 months. We used recursive partitioning methods to parse these data and identify sub-groups of ESI-3 patients who were discharged with a mean length of stay <120 minutes. To test the effectiveness of the proposed triage strategy, we simulated the ED using queuing models to compare the operational performance of the new routing policy to the status quo.

Results: We were able to identify groups of ESI-3 patients who could be sent to the low-acuity area based on our length of stay and discharge criteria (see examples in table). In simulation, the selective intake of these moderate-acuity, short-stay patients to minor care reduced the average waiting time of higher-acuity patients sent to the main ED by 50% and increased the utilization of the minor care area by 30%.

Conclusion: Increasing operational flexibility by identifying moderate-acuity patients who can be treated in a low-acuity area of the ED can improve the match between demand and treatment capacity in segmented areas, effectively eliminating the downside of sequestering low-acuity space from the main ED.

293 Utilizing the EMR to Reduce Unnecessary Ordering of Coagulation Studies for Patients with Chest Pain

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Background: Coagulation studies are often ordered in the initial evaluation of patients presenting to the ED with acute chest pain, despite evidence demonstrating increased cost without added benefit in the absence of very specific indications.

Objectives: Our goal was to reduce unnecessary ordering of PT/PTT for chest pain in the ED of a large academic medical center. We hypothesized this could be achieved via implementation of a stopgap measure in the electronic medical record (EMR).

Methods: This before and after study was performed between May and November 2014. In August 2014, a custom prompt was built into the EMR that appears each time coagulation studies are ordered, requiring clinicians to indicate which, if any, anticoagulant therapy patients are currently using with a single mouse click. Electronic records for all patients presenting with chest pain over a two-month period before and after intervention (with an intervening two-month washout period) were retrieved (n = 728 and n = 822, respectively). Representative samples, randomly selected for each time period (n = 103 and n = 104, respectively) were analyzed for frequency of PT/PTT ordering and indication. Orders were classified as necessary only if patients met any of the following criteria: Taking vitamin K antagonists, history of liver disease or known coagulopathy, initiation of anticoagulant therapy during ED treatment, or ED diagnosis of ST elevation myocardial infarction, hemorrhage or stroke. Frequency of total and unnecessary coagulation study orders was compared before and after intervention using chi-square analysis.

Results: Implementation of a stopgap measure in our EMR resulted in a significant reduction in ordering of PT/PTT for all patients with chest pain (73.8% before to 38.5% after, absolute reduction 35.3%, p < 0.001). Number of unnecessary PT/PTT orders was also significantly reduced (49.5% before to 23.1%, after, absolute reduction 26.4%, p < 0.001). Based on the cost of coagulation studies at our institution, this represents a potential cost reduction of more than \$37,000 annually.

Conclusion: Single-click EMR stopgaps serve as effective deterrents to indiscriminate ordering of laboratory studies in the emergency department.

294 Not So Fast! Beta-Blockers Blunt Tachycardia in Pulmonary Embolism: Implications for Clinical Decision Rules?

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Background: Several pulmonary embolism (PE) decision rules incorporate heart rate (HR). The Wells criteria and the PE Rule-out Criteria (PERC) use a threshold of 100 bpm, whereas the PE Severity Index uses a threshold of 110 bpm. Many patients use beta-blockers (BBs), a drug class known to decrease HR. Little is known about how BBs affect the presenting HR in patients with PE, and potentially, change the outcome of PE-related clinical decision rules.

Objectives: To evaluate the effect of pre-arrival oral BB use on the HR, sBP, and oxygen saturation of ED patients with PE.

Methods: We retrospectively identified all patients with acute, objectively-confirmed PE across 21 community EDs between 1/2013 and 3/2015. We collected demographics, past medical, and current clinical characteristics during their ED visit. We used descriptive analyses to compare patients with vs. without pre-arrival BB use, defined by an outpatient prescription fill within the prior 150 days. The primary outcome was peak HR. Secondary outcomes included lowest sBP, prevalence of tachycardia at two thresholds (HR >100 and >110 bpm), and lowest oxygen saturation.

Results: Among 2,788 ED adults with acute PE, the median age was 65 years (IQR 42 to 88), and 50.1% were female. Overall, 25% of patients demonstrated pre-arrival BB use. BBs were associated with a lower mean maximal HR of 95 vs 101 bpm (difference 6 bpm; 95% CI 3-9) and a lower prevalence of tachycardia: >100 bpm, 36.2% vs 49.8% (difference 13.6% [95% CI 9.4%-17.8%]); and >110 bpm, 22.2% vs 32.4% (difference 10.2% [95% CI 6.5%-13.9%]). There were no significant differences in lowest sBP or lowest oxygen saturation.

Conclusion: We found that ED patients with acute PE on pre-arrival BBs have a lower maximal HR than those not using BBs, and less frequently cross defined thresholds for tachycardia. Further study

is needed to determine how BB use affects the clinical decision risk scores of patients with suspected and confirmed PE.

295 In Very Low Risk Chest Pain Patients, is Discharge from Emergency Department Without Stress Testing Cost Effective?

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Background: With an estimated 255,000 patients annually placed in ED observation for stress testing (CDU), identifying a very low risk population not needing stress testing (ST) may provide cost savings but would likely never achieve zero missed MI or death. With increasing health care costs, society may not be able to afford an environment in which all low risk patients are sent to CDU.

Objectives: Evaluate a cost-effectiveness analysis (including legal payouts for missed MI or Death), comparing standard treatment to a treatment that discharged very low risk CP patients without ST.

Methods: Data from Mahler et al: 'Can the HEART Score safely reduce ST and cardiac imaging in patients at low risk for acute coronary syndrome' and estimates on probabilities and costs derived from the literature were entered into TreeAGE software. Standard arm was CDU all low risk, and the HEART arm compared a protocol to discharge from the ED any patients meeting very low risk criteria (HEART score 0-3, 4-6 hr troponin normal) without ST, and CDU the rest. Analysis focused on cost for missed MI/Death. One-way, 2-way and probabilistic sensitivity (Monte Carlo) analysis was performed.

Results: The average cost/patient in the CDU arm was \$2994 and \$1850 in the HEART arm (cost savings of \$1144/person). This could translate into more than \$290 Million annual savings. The HEART arm resulted in a very minimal increase in missed MI/Death (0.0008) which could extrapolate to 194/236,276 missed MI/death annually. Monte Carlo analysis with 50000 iterations favored HEART over standard CDU 79% of the time. Two-way sensitivity analysis suggested that as the probability of MI/Death in those discharged without ST decreased the amount that could be paid out for legal consequences increased, with a 1 million payout occurring when missed MI/Death in the discharged population was 0.02%.

Conclusion: Physicians carry the burden for any missed MI/Death in the form of medical malpractice and are more likely to continue to CDU low risk CP patients. Society, however, currently pays for this 'no risk' medical practice. Given the increasing burden of health care costs, a continued 100% risk aversion medical practice for low risk chest pain patients may not be realistic and understanding the effects of discharging very low risk patients directly from the ED is important.

296 Emergency Department-Based Assessment of Palliative Care Needs in Adults with Heart Failure

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Background: Heart failure (HF) is associated with frequent emergency department (ED) utilization and hospitalizations. The application of palliative care in HF can reduce ED visits and hospitalization but the prevalence of palliative care needs among HF patients in the ED has not been reported.

Objectives: To determine and characterize unmet palliative care needs in a random sample of adults with HF seeking care in the ED.

Methods: Data on palliative care needs were collected using the validated Screen for Palliative and End-of-Life Care Needs in the Emergency Department (SPEED) Instrument, a 13-question palliative care symptom assessment tool covering social, therapeutic, physical,

psychological and spiritual domains using a 10-point scale to score each question. For 5 of the 13 questions, threshold scores indicating a need for palliative care consult were previously derived from ED cancer patients.

Results: The mean age of all 81 participants was 67 years (50 to 93 years). Forty-seven (58%) were female and forty-six (57%) were African American. The highest scores across instrument items were observed for pain, shortness of breath and other physical symptoms. African Americans reported a significantly higher pain score compared with whites (6.8 vs. 5.1, $p=0.028$). Women rated their pain (3.7 vs. 3.1, $p=0.019$) and their depression (4.0 vs. 3.5, $p=0.006$) higher than men. African Americans (83% vs. 57%, $p=0.012$) and women (83% vs. 56%, $p=0.008$) had a higher proportion of respondents meeting the threshold score for pain. Individuals who reported any depression (48%) also reported a higher score for pain (6.9 vs. 5.3, $p=0.042$), shortness of breath (7.5 vs. 5.0, $p=0.002$), difficulty with their medications (1.8 vs. 0.5, $p=0.043$), difficulty with outpatient follow-up care (2.1 vs. 0.7, $p=0.036$), anxiety (5.8 vs. 1.8, $p<0.001$), feeling overwhelmed (5.0 vs. 2.3, $p=0.002$) and feeling that their medical condition seemed senseless or meaningless (4.5 vs. 2.4, $p=0.022$) than those without depression.

Conclusion: Adults with HF seeking care in the ED had significant symptom burden indicating a need for palliative care. We observed disparities among women, African Americans and individuals with self-reported depression, all of whom had higher symptom burden and should be prioritized for palliative care assessment.

297 Do Uninsured Patients in Illinois Have Higher Mortality After Trauma?

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Background: Being uninsured is associated with higher mortality after trauma. With the implementation of the Affordable Care Act, ACA, in Illinois there has been an approximately 25% decrease in uninsured patients.

Objectives: The objective of this study is to evaluate whether insurance-related mortality disparities have continued through the period of ACA insurance expansion in Illinois.

Methods: We obtained hospitalization claims data from all non-federal hospitals in Illinois from mid-2010 through first-quarter 2015. Cases were identified as those with trauma-related ICD-9 codes and an E-CODE pertaining major mechanisms of trauma (cut/pierce, fall, gunshot wound, motor vehicle collision, or other blunt injury). We employed poisson regression adjusted for clustering within hospitals and controlling for age, sex, race, zip code household median income, mechanism of injury, shock, extent of anatomic injury, comorbidities, hospital ED volume, and year of admission.

Results: A total of 87, 537 patients met trauma inclusion criteria. Uninsured patients dropped from approximately 20% to 8% over the

Figure 1. Mortality rates by insurance states during the period of Affordable Care Act insurance expansion

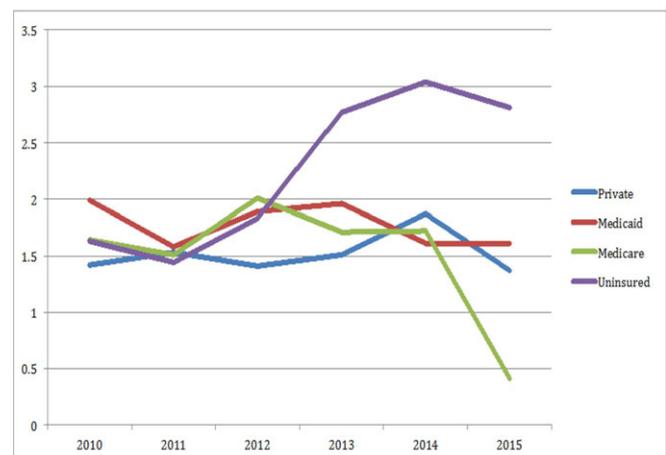


Figure 297 – Logan