Conclusions: NEWS can capture acutely ill patients to some degree. Using inpatient admission as a proxy for acutely ill, residents with NEWS of 5 and above were more likely to require inpatient admission. However, as a tool on its own, it is limited in its scope to avert ED attendance. There were conditions with a NEWS score of 0-1 which still required ED visits for treatment and services such as suturing and radiological investigations which were not available in the nursing homes. NEWS alone is also a poor tool in recognizing conditions such as mild acute bleeding (NEWS score 0), stroke (NEWS score 0) and myocardial infarction (NEWS score 3). Out of the 13 residents who were discharged from the ED, 4 residents could have potentially been managed in the community; they were diagnosed with LRTI, functional decline, dehydration and simple laceration. Matching these conditions with relevant care paths would allow appropriate utilization of community resources and may avert ED attendance. Teleconsultation facilitated the aversion of 3 cases but was not employed in 15 cases despite clear instructions. Further study is needed to explore the nurses' clinical decisionmaking process in overriding the NEWS-teleconsultation guidelines and transferring residents to the ED immediately, as well as a wider research into expanding the assessment tools used. Access to medical advice is vital for aversion of ED attendance whether by teleconsultation or GP attendance. Despite the limitations, NEWS is still useful as an initial assessment tool in a nursing home setting where nurses rely on clinical assessment and medical support is low. Supplemented with teleconsultation, NEWS can recognize acutely ill patients and avert ED attendance.

294 Machine-Learning-Based Electronic Triage: A Prospective Evaluation

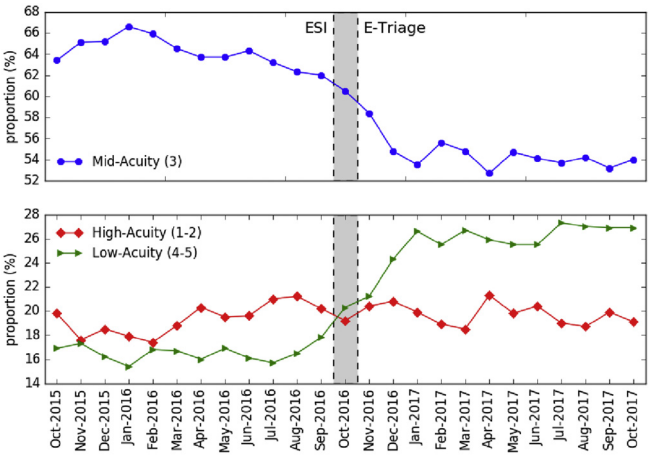
Levin S, Toerper M, Hinson J, Gardner H, Henry S, McKenzie C, Whalen M, Hamrock E, Barnes S, Martinez D, Kelen G/Johns Hopkins University, Baltimore, MD; StoCastic, Baltimore, MD; University of Maryland, College Park, MD

Study Objectives: To deploy and evaluate a machine-learning-based electronic triage (e-triage) decision support tool aimed at improving the differentiation of patients at triage with respect to clinical outcomes.

Methods: E-triage is an electronic health record (EHR) embedded decision support tool that supports nurse decisionmaking by applying machine learning to predict patients' risk of critical care outcome (in-hospital mortality, intensive care unit admission), emergency procedure, and hospitalization in tandem. Risk is predicted from patient's chief complaint, vital signs, demographics, and medical history and translated to an e-triage level recommendation. A pre- and post- e-triage implementation analyses was conducted at an urban academic ED with approximately 70,000 visits per year. ED patients triaged with the Emergency Severity Index 1-year pre-implementation (Oct-2015 to Oct-2016) and 1-year post-implementation (Oct-2016 to Oct-2017) using e-triage decision support were included in the study. Exclusions included those not receiving a final disposition, children aged less than 18 years, and those presenting with psychiatric conditions. Pre- and post- comparisons of acuity distribution, predicted outcomes, secondary outcomes of elevated troponin and lactate levels, and door-to-disposition decisions by triage level were compared.

Results: Post e-triage implementation, the distribution of acuity levels changed substantially. Low-acuity Level 4 and 5 patients increased 56% (16.5% pre- to 25.8% post-), mid-acuity Level 3 patients decreased by 15% (64.1% to 54.5%), while the proportion of high-acuity Level 1 and 2 patients remained constant (19.3% to 19.7%) as seen in Figure 1. The detection of patients with critical care outcomes as high-acuity increased from 14.1% (95% CI 13.4%-14.7%) pre- to 15.8% (15.1% to 16.5%) post-. This equated to an additional 208 (42-323) patients per year receiving expedited up-front care (designated Level 1 or 2) that experienced a critical care or emergency procedure outcome. Similarly, high-acuity detection of secondary outcomes improved by 34% from 6.8% (6.3%-7.2%) to 9.1% (8.5%-9.6%) for elevated troponin and 23% from 11.7% (11.1%-12.4%) to 14.4% (13.7%-15.0%) for elevated lactate. Operationally, the door-to-disposition decision time interval for hospitalized patients decreased by 35 min (from 433 to 398 min) post e-triage implementation and the door-to-disposition for discharged patients remained constant. This was achieved amongst challenges of increased hospital crowding and ED boarding times. Although favorable performance of e-triage was observed, all pre- and post- comparisons should be interpreted considering confounders that may affect ED performance measures over our 2-year study period.

Conclusions: Harmonizing nurses' clinical judgment with data-driven e-triage decision support was capable of improving differentiation of patients measured by clinical outcomes at triage. Using advanced data-science to leverage EHR data at the point-of-care provides opportunity to enhance decisionmaking and reduce untoward variability in emergency medicine practice.



295 The Impact on Emergency Department Visits With a Telemedicine Program Interfacing With a Nurse Triage Call Line

Russi CS, Beuning AJ, Powell RS, Horvath PR, Fogelson EC, Iqbal A, Cox DL, Olson KS, Smars PA, Peavler OP/Mayo Clinic, Rochester, MN

Study Objectives: Nurse triage phone lines (RNTL) are not a novel concept for health care organizations. They exist in many countries (United Kingdom, Australia, Sweden, Denmark, and Canada) as government-sponsored national triage systems; as well as in the United States where there a many smaller systems within various health care organizations. Patients calling the RNTL receive assessment and advice over the telephone regarding their medical symptoms. RNTLs may recommend follow-up with a Primary Care Provider (PCP), suggest home cares, or advice to proceed to an emergency department (ED) for immediate evaluation. Phone triage systems appear to be safe and patient satisfaction is generally high. Historically, studies looking at the effect of the availability of phone triage lines on health care utilization have shown mixed results. RNTLs often follow conservative protocols when providing a disposition for the patients they counsel. EDs often see patients when directed by the RNTL when outpatient management might be more appropriate. We aim to describe a novel intervention and outcomes using an emergency telemedicine (TeleEM) program to provide disposition when an RNTL suggests a patient should go to the ED.

Methods: A prospective, observational pilot over 3 separate weeks where the RNTL would contact the on duty TeleEM physician if their algorithm suggested a patient present to an ED or an urgent care (UC). The physician would discuss the case with the RNTL, or in cases of ambiguity, discuss with the patient directly. For each encounter, we collected: basic patient demographics (age and sex); original RNTL disposition; TeleEM MD disposition; if a patient presented to an ED within 24 hours; if a patient presented to an ED $>$ 24 hours or $<$ 7 days; disposition of patients who presented to an ED. We excluded any calls the RNTL felt needed a 911 response or could be seen in a clinic. The Mayo Clinic institutional review board approved of the study.

Results: There were 155 distinct calls for analysis. Mean age (years) = 42.5 (SD 28.1). 62% female. 57% (n=89) of the RNTL calls recommended an ED evaluation with 20% (n=31) due to lack of clinic access, leaving 43% (n=66) recommended to seek urgent care. Of the 89 RNTL ED dispositions, TeleEM physicians recommended the following: ED: 61% (n=54); UC: 6% (n=5); Clinic: 26% (n=23); Home Care: 8% (n=7) Of the 35 patients without an ED disposition by the TeleEM provider: 8 (23%) presented to an ED within 24 hours resulting in 1 (3%) admission and 7 (20%) discharges 3 (9%) presented to an ED $>$ 24 hours resulting in 2 (6%) admissions and 1 (3%) discharge Of the 66 RNTL UC dispositions, TeleEM physicians recommended the following: ED: 24% (n=16); UC: 30% (n=20); Clinic: 29% (n=19); Home Care: 17% (n=11) Of the 50 patients without an ED disposition by the TeleEM provider: 4 (8%) presented to an ED within 24 hours resulting in 1 (2%) admission and 3 discharges 2 (4%) presented to an ED $>$ 24 hours resulting in 0 (0%) admissions and 2 discharges.

Conclusions: Our TeleEM program was successful in aiding our RNTL with dispositions and mitigating ED use. Overall, patients when directed away from the ED by the TeleEM physician, few presented to an ED with even fewer requiring admission. We feel this demonstrates a safe practice and we plan to