Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

three research questions: 1. Is the Toolkit feasible to implement in the ED? 2. Are EDs better able to identify and manage cases of elder mistreatment when they implement the Toolkit? 3. How does implementation of the Toolkit affect other aspects of ED operations? To answer these questions, this study utilized a mixed-methods approach. Quantitative data included staff's baseline and follow-up assessments of ED practices related to EM; staff changes in knowledge before and after participation in training about screening for and responding to suspected cases of EM; aggregated hospital-level data on indicators of ED functioning; and patient-level data on screening rates and EM risk factors. ED staff provided rich qualitative information on the extent to which the Toolkit achieved seven feasibility criteria: practicality, acceptability, utility, implementation, integration, adaptability, and initial efficacy.

Results: We present preliminary findings organized by evaluation question. Staff training resulted in significant increases ($p < 0.05$) in knowledge and efficacy. Staff at all sites were receptive to the two-stage screening approach and found tools easy to use. The Toolkit was implemented differently in terms of which ED staff conducted the two-staged screening (ie, triage nurse, bedside nurse, social work). The proportion of patients screened at each site varied widely (18% to 87%), but screening rates increased over time at all sites. Of the older adults who were brief screened (n=15, 710), 1% screened positive in the brief screening stage and were then screened intensively using the triggered screen. Of these, 32% (n=42) were designated as suspected cases of elder mistreatment.

Conclusion: An elder mistreatment screening and response toolkit may be successfully implemented in EDs. Training led to increases in staff knowledge about EM following training. Rates of screening increased, and ED providers found the toolkit useful. We found variations between EDs in how the toolkit was adapted, deployed, and integrated into ED workflow.

EMF 32 Validation of the Admission for Geriatric patients in the Emergency Department (AGED) Algorithm

Serina P, Gray E, Kocherginsky M, Lo A, Lindquist L, Post L, Heinemann A, Cruz D, Dresden S/Northwestern University, Chicago, IL

Study Objectives: Identifying high risk older adults in the emergency department (ED) is essential for resource allocation and targeted interventions. The goal of this study was to develop and validate a geriatric risk score predicting emergency department admission using data available on initial assessment.

Study Design/Methods: The risk score was developed using an observational cohort of patients age 65 years and older who visited an urban academic ED between 9/1/19 and 2/28/20. The score was then validated using visits between 6/1/20 and 12/31/20. Patients were excluded if they left without being seen, against medical advice, were seen by the geriatric specialty service, or had been seen in the ED within the past 9 days. Forty-four key variables available upon triage were identified using the EMR including Estimated Severity Index (ESI), Clinical Frailty Scale (CFS), triage vital signs, demographics, comorbidities, and chief complaint. A Random Forest model with all key variables was performed to predict admission. The fifteen most important variables were included in a logistic regression model. These were compared to logistic regressions using CFS alone, ESI alone, and CFS, ESI, sex, and age. Secondary outcomes included ED return visit within 9 days and subsequent admission within 30 days of ED visit. The model was then validated using the second dataset for all 3 outcomes.

Results/Findings: Of 6863 visits of patients age 65 and older, 5606 (81.7%) met inclusion criteria for this study. Mean age was 74.5 years, 45.6% male. The Random Forest model with all predictors had an AUC of 0.800 [95% Confidence interval (CI): 0.789, 0.812], sensitivity of 76.0% and specificity of 69.3% for admission compared to AUC of 0.661 (CI: 0.647, 0.675) for CFS alone and AUC of 0.681 (CI: 0.666, 0.695) for ESI alone. The logistic regression with the top 15 predictors for admission had an AUC of 0.786 (CI: 0.775, 0.798), sensitivity of 66.3% and specificity of 76.3%. The Random Forest model for ED return visit had an AUC of 0.540 (CI: 0.507, 0.573) and for subsequent admission, AUC was 0.632 (CI: 0.610-0.655).

Conclusion: A risk prediction algorithm, the AGED algorithm, that incorporates clinical characteristics known about older adults at triage in the ED including CFS can predict hospital admission with moderate accuracy. The AGED algorithm has poor predictive performance for ED return visit within 9 days and subsequent admission within 30 days of ED visit. Next steps include incorporating the AGED algorithm into clinical practice to see if it has an impact on patient-centered and administrative outcomes.

33 Forecasting Daily Patient Arrivals during COVID-19 in Emergency Departments: A Deep Learning Approach

Etu E-E, Monplaisir L, Aguwa C, Arslanturk S, Masoud S, Krupp S, Shih D, Miller J/Wayne State University, Detroit, MI

Study Objectives: As the fourth wave of coronavirus disease 2019 (COVID-19) surges in Michigan, most health care systems are experiencing an increased hospitalization rate of infected COVID-19 patients. Understanding the arrival rates of patients to the emergency department (ED) is fundamental in managing the limited health care resources. Our objective is to develop an accurate forecasting model based on ED patients' arrival and COVID-19 status to help manage and facilitate a data-driven resource planning.

Methods: A cohort study of patients with clinical suspicion of COVID-19 evaluated at 2 EDs within an integrated health system that cares for a racially diverse population. We included patient arrivals, COVID-19 status, and demographic information between the dates of January 1, 2020 and March 16, 2021. We developed deep learning models (Long Short-Term Memory (LSTM)) to forecast patient arrivals in two geographically diverse EDs (denoted as ED1 and ED2). We used data from January to December 2020 for model training and data from January 2021 to March 2021 for model validation. The models are evaluated based on the root mean squared error (RMSE), the square root of the average of the squared error between predicted and observed values, and the mean absolute error (MAE), which provides the mean absolute difference between the predicted and the observed ED patient arrival rates per day.

Results: In ED1, there were 56, 61 total patient arrivals (1, 433 infected COVID-19 patients) with a mean age of 38.0 ± 21.2 years. A majority were female (33, 457, 59.1%) and 29, 040 (51.3%) were Black. The average patient arrival per day was 125.1 (SD 35.0) for those without COVID-19, and 3.3 (SD 3.6) for COVID-1 confirmed patients. In ED2, there were 74, 176 total patient arrivals (1, 546 infected COVID-19 patients) with a mean age of 45.0 ± 23.0 years. A majority were female (39, 521, 53.3%) and 10, 636 (14.3%) were Black. The average patient arrival per day was 164.7 (SD 33.2) for those without COVID-19, and 3.5 (SD 5.0) for COVID 19 confirmed patients. Figure 1 shows the observed and predicted patients' arrival for the two EDs for regular and confirmed COVID-19 patients. The LSTM models show accurate prediction one week in advance of daily patient arrivals for ED1 and ED2 with RMSE scores of 17 and 20 patients, respectively. The MAE values imply that, on average, the forecast's error from the true daily patient arrival rate is 13.9 and 16.0 for ED1 and ED2, respectively. For COVID-19 patient arrivals to ED1 and ED2, the RMSE score is 3 patients each, while th MAE values are 2.2 and 2.4, respectively.

Conclusion: This study demonstrates that an average RMSE prediction score of 18.5 and 3 patient arrivals per day for regular and COVID-19 confirmed patients is possible across EDs using LSTM one week prior to forecasting. Future validation and implementation of such forecasting models could impact effective planning and allocation of limited ED and hospital resources.

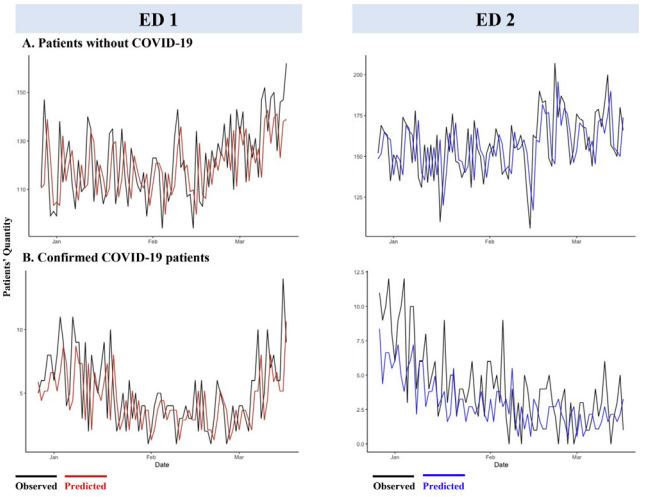

Figure 1: Predicted ED daily patient arrivals closely mirror observed arrivals in the validation cohort (Jan. – Mar. 2021).