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An Analysis of a Novel Telemedicine Intervention to Decrease Emergency Department Visits in a County Hospital System

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Study Objective: Hospital systems and insurance companies often utilize an Ask-My-Nurse (AMN) phone line to address patients’ health concerns and direct them to appropriate care sites in an effort to avoid costly emergency department (ED) care. Nurses follow strict and conservative protocols, potentially sending more patients to the ED unnecessarily. The study objective is to examine the impact of using an emergency physician (EP) telemedicine visit to assist the AMN line for patients who would otherwise be referred to the ED. To our knowledge no study has evaluated this concept. We believe implementing this workflow will reduce the number of patients being unnecessarily sent to the ED. The primary outcome measure is reduction in patients referred to the ED. Patient satisfaction is a secondary outcome.

Methods: This was a 4-month pilot study that includes patients who called a large county hospital system with two acute care hospitals’ AMN line Monday thru Friday 8AM-5PM between November 16, 2020 and March 19, 2021. Patients deemed to have an immediate life-threatening emergency, <28 days old, and pregnant patients >32 weeks pregnant were excluded. All other patients who otherwise would be sent to the ED by nursing protocols were then routed to an EP on-call for telemedicine. The EP would evaluate the patient either by telephone or video interface. A nurse was available to assist with executing orders for outpatient labs, imaging, or primary care doctor referral. Patients deemed to require an ED visit by the EP would then be referred with an electronic referral note. Trained interpreters were available to assist the EP. Notably, the EP’s were drawn from two different physician groups that staff each of the health system’s two hospitals. Demographic information and disposition information were recorded for each patient. Statistics were analyzed using Excel (Microsoft, Redmond WA).

Results: Within the study period, EP’s staffed 707 hours of telemedicine. 1351 patients who called AMN met criteria by nursing protocol for ED evaluation. 102 patients declined to be seen virtually by the EP or were unable to connect due to technical difficulties. 1249 patients had a telehealth visit with an EP; 74% were video visits. 894 patients (72%) successfully had their health issue addressed by the EP and avoided an ED visit. Overall satisfaction was 77.9%.

Conclusion: This study examines a novel role of EPs in telemedicine, where EPs augment an ask-my-nurse line to avoid ED visits. In the trial period, a significant majority of patients (72%) successfully avoided the ED and were treated definitively or referred to other less intensive sites of care such as primary care clinic. EP’s are ideally suited to treat urgent complaints via telemedicine and recognize emergent conditions that require in-person evaluation.

Importantly, health systems that wish to reduce ED visits should consider investment in tele-triage systems staffed by EPs.

National Survey of Emergency Physicians: Motivations, Barriers, and Capabilities for Telehealth Delivery of Emergency Care Services

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Study Objectives: The COVID-19 pandemic imposed both constraints and opportunities for innovation in emergency care delivery. Visits to the emergency department (ED) plunged by as much as 42% in the US, resulting in excess morbidity and mortality due to patients deferring or avoiding emergency care. With the declaration of a public health emergency, payors such as Medicare authorized emergency physicians (EPs) to bill for evaluation and management services delivered through telehealth—potentially allowing EPs to project emergency care beyond the four walls of the physical ED. If adopted, the provision of emergency care via telehealth could expand the reach of emergency medicine, not only during a pandemic but also more broadly, and especially as aging populations choose to receive more care at home. Such expansion of emergency care could benefit from perspectives of EPs in terms of the motivations, barriers, and necessary capabilities. Thus, our objectives were to survey and profile EPs to better understand the potential for telehealth in emergency care delivery.

Methods: In collaboration with ACEP and the Emergency Medicine Practice Resource Network (EMPRN), we designed a survey instrument comprised of 5 main questions that provided ranked choice selections. The survey was sent electronically to a group of EMPRN volunteers representing EPs from diverse geographic, age, and practice levels.

Results: The survey was sent to a total number of 765 participants, of which a total of 140 (18%) responded. In terms of motivations, respondents identified early engagement with the option to escalate care to the ED if necessary (77% ranked as very important or somewhat important). Respondents also identified the opportunity to quickly address non-life-threatening complaints that may not have needed an ED visit (76% ranked as very important or somewhat important). The top two identified barriers ranked as very significant or somewhat significant were the inability to obtain an adequate evaluation of the patient (76%) and a lack of support personnel in patients’ homes to assist with virtual visits (64%). A related series of responses ranked the needed capabilities necessary for supportive personnel to address barriers to telehealth use. (Table 1).

Conclusions: This survey is a mechanism to begin understanding EPs’ perceptions and what they would need to feel comfortable to safely provide telehealth services in the ED. The results revealed that EPs recognize certain opportunities in terms of the potential future of telehealth in emergency care delivery. However, specific barriers were identified. This study suggests that the ability to escalate care and obtain adequate telehealth exams with presenters and diagnostic support will be important for EPs to feel safe delivering telehealth services.

Table 1: Capabilities

| Capability | Very Important | Somewhat Important |
|------------|----------------|--------------------|
| Ability to escalate care as needed, including transport to the ED | 70% | 16% |
| Ability and authority to help patients with telehealth and remote monitoring technology | 36% | 39% |
| Ability and authority to provide diagnostic support e.g., vital signs, lung sounds, 12-lead ECG, SpO2 etc. | 41% | 31% |
| Ability and authority to administer ordered medications e.g., oxygen, respiratory treatments, IV therapy, etc. | 38% | 29% |
| Ability and authority to provide in-home assessment of patient safety and wellbeing | 29% | 37% |

Effect of the COVID-19 Pandemic on Emergency Department Adult Psychiatric Visits

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Study Objective: In March 2020, the COVID-19 pandemic reached the New York tri-state area, which, at the time, was one of the regions in the United States (US) that the virus most severely affected. ED visits dramatically declined, likely due to social isolation mandates and fear of exposure to the virus. Quarantining at home, fear of becoming sick, and job disruptions caused the level of stress in the population to increase. In a previous US study, the proportion of ED visits for some psychiatric conditions increased. Our goal was to determine whether the proportion of ED visits for specific psychiatric conditions, namely anxiety disorders, depression, self-harm/suicidal thoughts, bipolar disorder, and psychotic disorders, changed after the arrival of COVID-19.

Methods: Design: Retrospective cohort. Setting: EDs of 28 hospitals within 150 miles of New York City. Hospitals were teaching and non-teaching in rural, suburban and urban areas. Total annual ED volumes were 12,000 to 122,000. Population: Consecutive ED patients ≥ 21 years old from March 1 to November 30 in 2019 and 2020. Data analysis: We tallied the number of patients in 2019 and 2020 with anxiety disorders, depression, self-harm/suicidal thoughts, bipolar disorder, and psychotic disorders, identified using International Classification of Disease codes (version 10). We calculated the proportion of these visits to total ED visits.
visits in 2019 and 2020. We report the changes in these proportions from 2019 to 2020, along with 95% CIs.

Results: Total ED visits decreased 27%, from 844,017 in 2019 to 618,195 in 2020. In 2019 and 2020 combined, the number of patients were: 13,151 with anxiety disorders, 6,884 with depression, 8,886 with suicidal ideation/self-harm, 3,252 with bipolar disorder, and 7,129 with psychotic disorders. The changes [with 95% CIs] in the proportion of visits from 2019 to 2020 were: anxiety disorders -1% [-4, +3%], depression -5% [-10, -1%], self-harm/suicidal thoughts +23% [+18, +29%], bipolar disorder +14% [+6, +22%], and psychotic disorders +23% [+18, +29%].

Conclusion: The proportion of adult ED visits for self-harm/suicidal thoughts, bipolar disorder, and psychotic disorders increased following the arrival of COVID-19, whereas the proportions for anxiety and depression changed minimally. These results are somewhat different from the findings in the previously reported study. Our study highlights the need for continued surveillance of the impact of COVID-19 on mental health.

287 Association Between Comorbid Mental Illness and Preceding Emergency Department Visits in Unplanned Admissions

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Study Objective: Patients with mental illness are likely to revisit emergency departments (EDs) and become “frequent flyers,” resulting in the potential underestimation of their illness severity. However, little is known about whether patients with mental illness have preceding ED visits before unplanned admission. The aim of this study was to investigate the association between having mental illness and having preceding ED visits in patients with unplanned admission.

Methods: This is a case-control study using data from EDs of three large tertiary medical facilities in Japan. We included adult patients (aged ≥16 years) who were admitted to these hospitals via the ED from 2017 to 2020. To investigate whether patients with mental illness were more likely to have preceding ED visits within 30 days before admission compared to those without, we used univariable and multivariable logistic regression models. In the multivariable model, we adjusted for age category (<34, 35–54, 55–64, 65–84, and ≥85 years), sex, facility, year, and ambulance use.

Results: Of a total of 15,429 admissions, 766 (5.0%) had mental illness and 14,663 (95.0%) did not have mental illness. Patients with mental illness was younger than those without mental illness (70 years old vs. 76 years old, p<0.001). The prevalence of preceding ED visits within 30 days before unplanned admission among patients with mental illness was significantly higher than in patients without mental illness (17.1% vs. 8.8%; unadjusted odds ratio, 2.15; 95% confidence interval, 1.76–2.61; p<0.001). In the multivariable regression model, having mental illness was significantly associated with a higher prevalence of preceding ED visits within 30 days of unplanned admission (adjusted odds ratio, 2.57; 95% confidence interval, 2.10–3.15; p<0.001). The median interval between preceding ED visits and unplanned admissions were similar between the two groups (6 days vs. 5 days, p=0.20).

Conclusions: The presence of mental illness was significantly associated with a higher prevalence of preceding ED visits within 30 days before unplanned admission. The result suggests that physicians should be more deliberate in discharging patients with mental illness from EDs and in providing care post-ED discharge. Our findings warrant further investigation on the potential influence of having mental conditions on the screening process currently undertaken at the preceding ED visits.

288 Assessing the Performance of Clinical Diagnostic Models for Dehydration among Patients With Cholera and Undernutrition in Bangladesh

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Study Objective: Diarrheal diseases are one of the most common acute conditions, ranking 5th in causes of death in low-income countries in 2019. Though a critical step in reducing mortality from diarrheal disease, accurately assessing dehydration severity is complicated by cholera and undernutrition. This study seeks to assess the accuracy of two clinical diagnostic models for dehydration among patients over five years in two distinct subgroups (those with cholera and undernutrition) and compare their respective performance to the World Health Organization (WHO)’s algorithm.

Methods: This is secondary analysis of data collected from the NIRUDAK study, a prospective cohort study conducted at the ICDDR, between March 2019 – 2020. Clinical and sociodemographic information along with a stool sample for culture were collected from each patient upon enrollment and dehydration assessment. In this subgroup analysis, accuracy of the full and simplified NIRUDAK models for predicting severe and any dehydration was measured using the area under the receiver-operator characteristic curve (AUC) among patients over five with/without cholera and with/without wasting. Bootstrap with 1000 iterations was used to compare the m-index for each NIRUDAK model to that of the WHO algorithm. Statistical significance was established at an alpha level of 0.001.

Results: A total of 2,139 and 2,108 patients were included in the nutrition and cholera subgroups respectively with an overall median age of 35 years (IQR=42) and 49.6% female. All subgroups had acceptable discrimination in diagnosing severe or any dehydration (AUC >0.60); though the full NIRUDAK model performed best among patients without cholera, with an AUC of 0.82 (95% CI: 0.79, 0.85), and among patients without wasting, with an AUC of 0.79 (95% CI: 0.76, 0.81). Compared to the WHO’s algorithm, both the full and simplified NIRUDAK models performed significantly better in terms of their m-index (p<0.001) for all comparisons, except for the simplified NIRUDAK model in the wasting group (p=0.003).

Conclusions: Both the full and simplified NIRUDAK models performed well less in patients over five years with cholera and/or wasting; however, both performed better than the WHO algorithm. Further research should be conducted to explore potential differences in the accuracy of clinical signs of dehydration and clinical diagnostic models of dehydration in new patient populations.

289 Connecting Patients Diagnosed With HIV in the Emergency Department to Care During the COVID-19 Pandemic

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Study Objective: HIV screening in the ED is an effective means of identifying new cases of HIV. The COVID-19 pandemic caused significant disruptions to both ED operations and outpatient care, yet little is known about the impact of the COVID-19 pandemic on ED-based HIV screening programs. We hypothesized that our electronic medical record (EMR) triggered HIV screening program would continue to identify new HIV positive patients and link them to care during the COVID-19 pandemic.

Methods: We conducted a retrospective chart review of ED patients screened for HIV and compared the average monthly tests performed, number of confirmed HIV positive cases, and rates of linkage to care before and after the onset of the COVID-19 pandemic. We used 3/13/2020 as the start date for the pandemic and compared data in a 5-month period prior to the pandemic (limited to initiation of EMR triggered HIV screening) and a 9-month period during the pandemic. Two tailed t-tests were used for comparison of means.

Results: A total of 20,825 patients were screened for HIV from 11/18/2019 to 12/12/2020 (8,417 pre-pandemic and 12,408 during the pandemic). On average, more HIV screening tests were performed in the pre-pandemic period compared to the pandemic period (1,683/month pre-pandemic versus 1,379/month during pandemic). However, when accounting for ED volume changes, a similar rate of patients in the pre-pandemic period (35.8% of all patients seen in the ED) were screened compared to during the pandemic (34.7% of all patients seen). In the pre-pandemic period 11/18/2020 – 3/12/2020, a total of 25 patients were diagnosed with HIV and all patients were linked to care. In the pandemic period 3/13/2020 – 12/12/2020, 27 patients were diagnosed with HIV. Of the 27 patients diagnosed, 22 (81%) were linked to care. Two patients died prior to attending specialist appointments during the pandemic (88% linkage to care accounting for deaths). The average time to the first attended specialist appointments for non-admitted patients was not significantly greater during the pandemic period (6.0 days pre-pandemic vs. 6.9 days during pandemic, p=0.55).

Conclusions: EMR-generated HIV screening allows for continued efforts to diagnose and link patients to care despite the global disruptions caused by the COVID-19 pandemic. The lack of disruption to screening rates may be partly due to the minimal disruption of the screening and the linkage to blood tests being