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To Screen, or Not to Screen, that is Depression

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of stay (LOS) (1 hour or less, 2-5 hours, 6 hours or more), and substance-related diagnosis. Variables are compared between each quarter using a generalized linear model.

Results: There were 938 visits total during this time (467 male, 467 females, 4 missing). 598 were Hispanic, 274 non-Hispanic White, 147 Native American, 45 Black, 8 Asian, 4 NH/PI, and 146 declined or unknown. The vast majority of visits were in adolescents 15-17yrs old. The most common diagnosis was cannabis-related disorder at 306 encounters, followed by alcohol n=303. The trajectory of visits from July 2019-March 2022 showed a decline from 98 visits in July-Sept 2019 to 51 visits in April-June 2020, followed by increase to 102 visits in Jan-Mar 2022. Comparisons of equivalent quarters for each year were as follows: Q1 (2020 n=71; 2021 n=71, 2022 n=102). Q2 (2020 n=51; 2021 n=81). Q3 (2019 n=98; 2020 n=75; 2021 n=107, 2019-2021). Q4 (2019 n=90; 2020 n=57; 2021 n=111). There were fewer female visits prior to onset of COVID-19 (n=40 in females vs n=58 in males in 2019 Q3) and decreased further early in the pandemic (N=29 vs 46 in males in 2020 Q3), but then rose more rapidly than males (n=59 female, n=48 male, 2021 Q3). The proportion of visits with LOS 5 hours in Q3 initially decreased from 27.8% of visits(n=25) in 2019 to 19.3% (n=11) in 2020, then increased significantly to 35.1% in 2021 (n=39). There was not a significant effect of other variables.

Conclusions: The COVID-19 pandemic resulted in a rapid decrease in ED substance-abuse pediatric presentations, which rebounded to levels greater than pre-COVID. Females increased more than males. Visits with longer LOS increased during later pandemic. Future work includes understanding how mental health comorbidities and other socioeconomic stressors may relate to these findings.

3 Patient-specific Characteristics that Influence a Psychiatrist, Perception of a Patient, Risk for Attempting Suicide in the Emergency Department

Adam Takatsuka, Trevor Nykamp, Wesley Speer, Savannah Benko, Jacob Bart, Paris St Clair, Kirk Harris, Kirk McCall, Pooja Agarwal, Corey Goldstein, Eitan Kimchi

Background: There is evidence that factors such as unstable housing, substance use, and past psychiatric history may elevate one, lifetime risk of suicidality. However, data is limited regarding how these factors relate to the perception of acute risk of suicidality. Thus, psychiatrists may consider the presence of known chronic risk factors when assessing a patient, acute suicide risk level. It is thus possible that chronic risk level may be conflated with acute risk level. At our institution, patients in the Emergency Department (ED) are considered to be at high risk for attempting suicide in the hospital if they score positively on a suicide screening tool or if an ED physician assesses them as high-risk. Those who are considered high-risk are assigned a one-to-one safety assistant for constant visual observation. All patients assigned a safety assistant for suicidality are then formally evaluated by the psychiatric consultation team, who assess the patient, level of acute suicide risk and recommend whether to continue or discontinue the safety assistant. Notably, there is limited data on which patient-specific variables may influence a psychiatrist, clinical assessment of acute suicide risk in the ED.

Objective: We sought to measure how certain patient-specific variables influence a psychiatrist, assessment of acute suicide risk level. We therefore evaluated how each of these variables might affect a psychiatrist, decision to continue or discontinue an assigned safety assistant.

Method: This was a retrospective study examining 218 patient encounters for whom a one-to-one safety assistant was ordered for suicidality. We analyzed patients, 1) demographic data such as age, race, housing situation, and socioeconomic status; 2) ED workup including urine drug screen results and blood alcohol level; and 3) past psychiatric history such as prior psychiatric hospitalization(s), suicide attempt(s), and presence of outpatient mental health care. We used a multivariate logistical regression to analyze how each of these variables contributed to a psychiatrist, decision to continue or discontinue the assigned safety assistant.

Results: Female sex and positive blood alcohol levels resulted in increased likelihood that the psychiatric consultation team recommended discontinuing a safety assistant. The presence of at least one past suicide attempt resulted in increased likelihood that the psychiatric consult team recommended continuing a safety assistant.

Conclusion: The results suggest that past suicide attempt(s) were directly correlated with a psychiatrist, perception of acute suicide risk. The presence of ethanol, on the other hand, was inversely correlated with a psychiatrist, perception of acute suicide risk, contrasting existing data that supports ethanol use as a chronic risk factor for suicide. We propose several theories for this finding, including clinician distrust of an intoxicated patients, provided history and symptoms, confirmation bias favoring discharge over prolonging care via ED observation, and the disinhibitory effects of ethanol resulting in statements that may not reflect true intentions. However, further data is required to explain this discrepancy.

4 To Screen, or Not to Screen, that is Depression

Alexa Mazur, Harrison Constantino, Kathryn Dover, Prentice Tom, Michael P. Wilson, Ronald G. Thompson

Introduction: Universal mental health screening has been shown to effectively identify people with previously

undiagnosed significant depression, result in earlier diagnosis and treatment, and, subsequently, decrease morbidity, mortality, and disease burden. However, primary care settings continue to rarely screen patients for depression. Harnessing machine learning to analyze speech samples for signs of depression has been shown to identify depressed individuals. This cross-sectional study aims to evaluate the feasibility of developing a neural network to detect signs of depression from speech samples and represents one of the first attempts to understand whether voice biomarker technology might be useful in the diagnosis of patients with depression.

Methods: Both males and females 18 years in the United States and Canada, recruited via social media, provided demographics and were enrolled in a cross-sectional study to develop a machine learning model to detect signs of depression using at least 45 second voice responses to the prompt, how was your day?, and self-reported PHQ-9 scores. The PHQ-9 instrument has demonstrated both a sensitivity and specificity of 0.88 and currently, primary care physicians correctly identify patients for screening 47.3% of time. To determine the model, predictive performance, all authentic and unique completed responses that met audio quality and length requirements were included in this training and validation analysis. Preliminary performance was measured using sensitivity, specificity, and both positive predictive value (PPV) and negative predictive value (NPV) metrics with 95% confidence intervals (CI). Before inputting, responses were individually reviewed for authenticity, converted to homogeneous audio quality, transformed into numerical representations, and divided: 80% training (n= 12,947) and 20% validation (n= 3,246) without sample overlap. Prediction outputs were scaled between 0 and 1. Quantitatively, signs of depression corresponded to a value 0.573 or equal to 1 and anticipated PHQ-9 score 10. Signs of depression not detected corresponded to values equal to 0 to 0.427, and PHQ-9 score 10. Values between 0.427 and 0.573 were labeled, further evaluation recommended.

Results: Evaluating the model, ability to detect signs of depression from at least 45 seconds of free speech demonstrated a sensitivity of 0.74 (95% CI: 0.72,0.77) and specificity of 0.75 (95% CI 0.72,0.77). The PPV was 0.75 (95% CI: 0.73, 0.77) and the NPV was 0.74 (95% CI: 0.71, 0.76). A total of 653 participants were labeled, further evaluation recommended.

Conclusions: This cross-sectional study to train and validate a machine learning model was feasible for detecting signs of depression utilizing at least 45 seconds of a free speech sample when compared to performance metrics for the PHQ-9 and/or clinician judgment for assessment alone. This study suggests voice biomarker technology may be a viable method to improve identification of depressed patients for screening and subsequent treatment in primary care settings. Further feasibility and acceptability studies to pilot clinical implementation of this technology are warranted.

5 Racial Disparities in Emergency Restraint Use for Agitated Patients

Daniel Stone

Background: The COVID 19 pandemic and the murder of George Floyd have prompted healthcare organizations to reexamine racial inequities in their care, challenging us to produce lasting, fundamental change. Mental health disorders, both diagnosed and undiagnosed, have increased in volume and developed new challenges for acute care practitioners during the pandemic. Additionally previous research has suggested that there are intrinsic and extrinsic biases that affect how care is delivered to patients presenting with mental health crises.

Methods: Through nominal group technique, we identified topics for equitable-care-oriented QI in the emergency department (ED) of our Level-1 Trauma center. Initial review of triage, left-without-being-seen, and fast-track data did not demonstrate significant racial disparities in standard benchmarks. We therefore focused on behavioral codes and restraint use. We prospectively collected data on all behavioral codes over a 3-month period, including demographics, visit characteristics, and certain aspects of restraint use including type of restraint, length of restraints, medication use, and re-initiation of restraints. In addition to tracking these metrics, employee perceptions of the psychiatric mental health emergencies were polled and evaluated.

Results: Our QI process identified varying levels of disparities in care. Over the study period, white, non-white, and black patients comprised 50.5%, 49.5%, and 28.7% of the ED patient population, respectively, and 50%, 50%, and 44% of the patients who were subject to behavioral codes. Of those patients who had behavioral codes called, restraints were used for 64.8% of white patients, 64.3% of non-white patients, and 67.2% of black patients. Of those arriving by ambulance or police, 20% arrived with pre-hospital restraints or handcuffs, and of those, 90.9% were placed in restraints on arrival to the ED. Of those patients who had restraints placed, 4-points were used for 34.1%, 26.1%, and 25.5% of white, non-white, and black patients, respectively, and the restraint chair was used for 30.7%, 38,6%, and 41.8% of those same groups. Medications were given to 80.7%, 88.7%, and 91.4% of white, non-white, and black patients who were placed in restraints, respectively, and to 77.4%, 80.6%, and 83.3% of those same groups of patients who were not placed in restraints. None of the differences were statistically significant. Of those patients who had restraints placed and then discontinued, 13% were re-restrained at some other point during their visit. Among other responses, nearly half of all ED employees thought that patients should ideally not be restrained during behavioral codes and that, if necessary, the restraint chair provides a better experience than 4-point restraints.