(Shaman, 2020) and 70% of CCBs in each county were assumed to be occupied by non-COVID-19 patients. For each county, three potential constraints on increasing capacity were estimated: the number of nurses, the number of physicians (including APPs), and the number of CCBs. One or more constraints could be active at any time.

Results: Prior to optimization, 91% of counties were able to meet the demand for projected case counts. In contrast, 8.4% were limited by nursing resources, 0.09% by physicians, and 0.8% by the number of CCBs. After optimization, 16.9% of counties sent nurses to a different county(s) (median 6 nurses sent, IQR 13.75) compared with 5.5% counties receiving them (median 23, IQR 43.5). Fewer physicians were relocated (0.09% sent, median 1, IQR 1; 0.06% received, median 2.5, IQR 1.5) (Figure). Using baseline staffing ratios and availability, these redistributions led to a reduction in total unmet demand from 24,155 to 19,976. In order to fully meet demand across the US under these conditions, an additional 1,225 physicians, 41,939 nurses and 13,905 CCBs would have been needed.

Conclusion: This work shows that with the redeployment of resources even within state boundaries may provide relief to areas of need without causing strain in other locations. While validation with actual redeployment during the pandemic can improve estimates, these models can provide decision support to stakeholders by suggesting optimal reallocation or the ability of existing resources to support additional capacity.
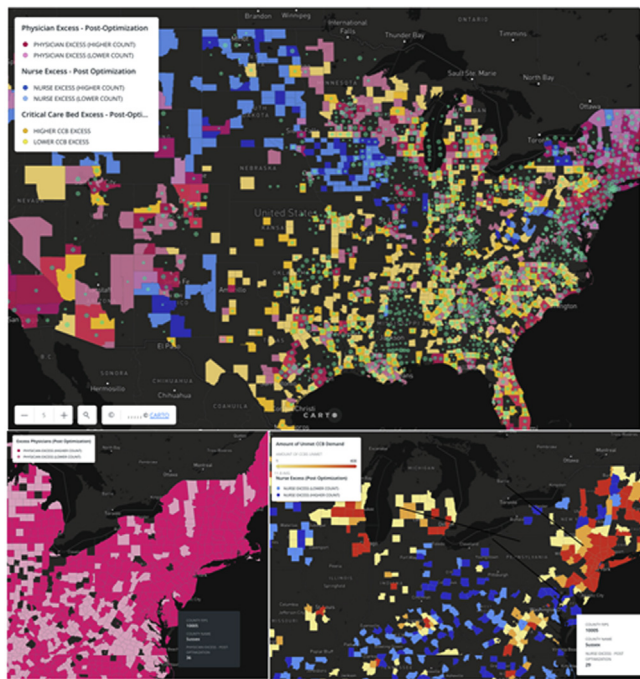
3 Non-specific ECG Findings in Patients with Low High-Sensitivity Troponin Values Are Not Associated With Significant 30-day Adverse Outcomes

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Study Objectives: Although some ED risk stratification tools (eg, HEART score) consider non-specific electrocardiogram (ECG) findings as an aid in disposition decisions, their clinical value in patients with an initially normal high-sensitivity troponin I (hsTnI) is unclear.

Our purpose was to determine if non-specific ECG changes are associated with 30-day major adverse cardiac events (MACE) in ED patients presenting with suspected acute coronary syndrome and who have a low initial hsTnI.

Methods: Using the prospective Siemens Atellica hsTnI FDA submission observational database, we evaluated the association between non-specific ECG changes (defined as left bundle branch block (LBBB), ST depression or T wave inversions) and 30-day MACE (death, myocardial infarction, heart failure, or percutaneous coronary intervention). Eligible patients presented to one of 28 US EDs with suspected acute coronary syndromes from April 2015 to April 2016, and had hsTnI obtained at 1, 3, and 6 hours after ED presentation. After excluding ST-elevation myocardial infarction and unstable ECG changes (VT, VF, tachyarrhythmias, or AV blocks), the association between non-specific changes on the initial ECG and the initial hsTnI (Siemen's Atellica, Siemens Healthineers, Inc, Malvern, PA) with 30 day MACE was determined by chi-square testing.

Results: Of 2667 enrolled, 1037 patients met the inclusion criteria and were included in the analysis. Mean age was 61 years (SD ±12), 55% were male, with 55% white and 40% African American. Median (IQR) time from symptom onset to presentation, and presentation to specimen collection was 87 (0, 216) and 147 (117, 178) minutes, respectively. The most common presenting symptom were chest pain (83%) and dyspnea (10%). ECG findings were T wave inversion or non-specific T changes, ST depression or non-specific ST changes, RBBB or early repolarization, or LBBB in 40, 15, 10, and 2%, respectively. MACE occurred in 118 (11.4%) patients, with ACS without MI (69 patients, 6.65%) and heart failure (24 patients, 2.3%) being most frequent. In patients with hs-cTnI <400 ng/L, there was no association between non-specific ECG changes and 30-day MACE (p=0.71). If the hs-cTnI was ≥400 ng/L there was an association with increased rates of 30-day MACE and nonspecific ECG findings (p=0.026).

Conclusion: In ED suspected ACS patients without STEMI or unstable ECG changes, and a hsTnI <400 ng/L, non-specific ECG findings have no association with 30-day adverse cardiac events. The use of non-specific ECG findings to affect disposition decisions should be reconsidered.

4 Impact of the SARS-CoV-2 Pandemic on Emergency Department Presentations in an Integrated Health System

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Study Objectives: We aimed to quantify the impact of the SARS-CoV-2 pandemic on emergency department (ED) volumes and patient presentations, and to evaluate changes in community mortality for the purpose of characterizing new patterns of emergency care utilization.

Methods: This is an observational cross-sectional study using electronic health records for ED visits in an integrated, multi-hospital system with academic and community practices across four states for visits between March 17 to April 21, 2019, and February 9 to April 21, 2020. We compared quantity and proportion of common and critical chief complaints and diagnoses, triage assessments, trauma activations, throughput, disposition, and hospital lengths-of-stay for selected diagnoses, and out-of-hospital deaths. Academic and community hospitals were evaluated separately and in combination for an overall picture of emergency department utilization.

Results: Compared to both the preceding four weeks (n=37,670), and the prior year (n=35,037), ED visits from March 17 to April 21, 2020 (n=18,646) decreased 49% and 53.2% respectively. The total numbers of patients diagnosed with myocardial infarctions (STEMI and Non-STEMI), stroke, appendicitis and cholecystitis all decreased by a similar percentage. While there were fewer visits for mental health (n=1104 in preceding weeks, n=1032 for year-prior, n=752 during pandemic), they made up a larger proportion of ED visits - 2.9% for both baselines and 4% during period of interest (p<.001 for both). Compared to both baselines, the percentages of traumas were similar; however, the absolute number of red (n= 35 during COVID; n=72, p<.001 peri-COVID; n=67, p=.002 pre-COVID) and yellow (p=.002 peri-COVID; p=.004 pre-COVID) declined overall, driven by a drop at academic centers by nearly 60% for red traumas and 50% for yellow. Mortality was considered a surrogate for delayed/deferred emergency care. Southern Minnesota Regional Medical Examiner's Office data showed an increase in natural deaths during the COVID period (n=250) versus pre-COVID (n=204) baseline (p=.037). Out-of-hospital mortality for natural (non-COVID-related) and non-natural deaths increased from 73 pre-COVID to 128 during the COVID period (p<.001). The significant increase in out-of-hospital mortality drives the overall mortality increase. There was an increase in deaths, driven by out-of-hospital mortality.

Conclusion: Fewer patients presenting with acute and time-sensitive diagnoses suggests that patients are deferring care, this may be further supported by an increase in out-of-hospital mortality as well as a lower number of patients presenting with complaints and diagnoses that would be expected to remain stable for a given population during the periods studied. Understanding which patients are deferring care

and why will allow us to develop outreach strategies and ensure that those in need of rapid assessment and treatment will continue to seek it, preventing downstream morbidity and mortality.

## 5 Burden of Out of Hospital Cardiac Arrest in New York City during the COVID-19 Pandemic

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Study Objectives: As of June 10, 2020, there have been 17,300 confirmed and an additional 4,693 suspected COVID related-deaths in New York City (NYC). While much attention was given to the overwhelming burden on hospitals and skilled nursing facilities during the pandemic, it is less well known how the pandemic impacted EMS systems and rates of out-of-hospital cardiac arrest (OOHCA). The NYC Regional Emergency Medical Advisory Committee (REMAC) is responsible for oversight and quality in out-of-hospital care in NYC. This study's primary objective was to assess the burden of cardiac arrest in during the pandemic.

Methods: This observational study uses aggregate data from the New York City region collected through the National EMS Information System (NEMSIS). Daily counts of cardiac arrest incidents stratified by each of the five boroughs (geographical divisions) in NYC and by final disposition (eg, transported to the hospital or pronounced on scene) were obtained for the time periods of February 2020 through April 2020, and for the same time period in the final year. Descriptive statistics were used to describe and compare the daily counts of cardiac arrests and the proportion of patients pronounced in the field between the current year during the pandemic time period and the corresponding time period in 2019. This study was determined to be exempt by the Mount Sinai Institutional Review Board.

Results: In NYC during the COVID-19 pandemic, EMS experienced a 220% increase in cardiac arrest call responses in February - April, 2020 (8,837) compared to February - April, 2019 (4,022), peaking on April 6 at 330 cases in a single day. (See Figure 1). During this period, the Bronx experienced the highest rate of increase at 243% higher in 2020 compared to Queens (238% increase), Kings (231%), New York (184%) and Richmond (143%). For all of NYC, the rate of transport for OOHCA decreased during this time period from 37% in February-April 2019 to 16% in February-April 2020.

Conclusion: There was exponential growth of the rate of OOHCA during the initial phase of the pandemic in NYC and there was a sustained increase through the month April 2020. With a 220% increase in cases over the course of three months and over a 780% (42 to 330 cases) increase on the highest day of OOHCA, and in light of a concurrent burden on NYC hospitals, our EMS system experienced an unprecedented demand for critical care and resuscitation. Further studies are needed to better understand to what degree the increased in OOHCA was attributed to the disease itself, or due to delaying needed care for other conditions. In planning for future pandemics, strategic planning should include consideration of impacts on operations and capacity of the regional EMS system.

New York City: Cardiac Arrest Responses 2020 v. 2019
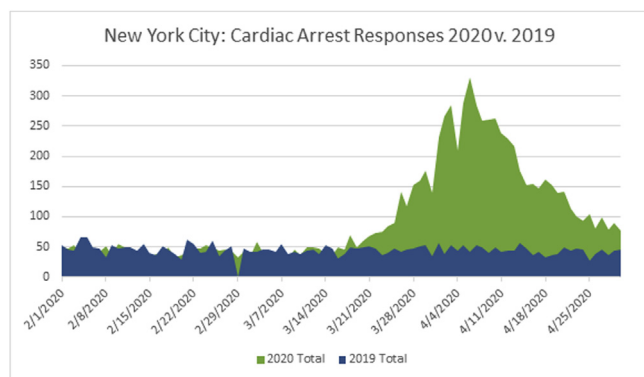
6 Lung Ultrasound versus Chest X-ray for the Diagnosis of COVID-19 Pneumonia

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Study Objectives: The viral illness severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), more commonly known as coronavirus 2019 (COVID-19), has become a global pandemic infecting over 2 million individuals worldwide. Symptoms are often vague and physical exam findings have proven unreliable as indicators of infection. Therefore, diagnosis typically relies on imaging or nasopharyngeal swabs. The objective of this study was to compare point-of-care lung ultrasound (LUS) with chest x-ray (CXR) to determine which is the more accurate diagnostic imaging modality for diagnosing COVID-19 pneumonia.

Methods: This was a single-center, prospective, cohort study at an urban university hospital with >105,000 patient visits annually. Patients >18 years old, who presented to the emergency department (ED) with signs and symptoms of COVID-19, were eligible for enrollment. Each patient received a LUS, performed by an emergency medicine resident or emergency physician (EP), using a portable, handheld ultrasound and a portable AP CXR after the LUS was completed. High-risk patients or those with an abnormal imaging finding underwent a non-contrast-enhanced computed tomography (NCCT) as the diagnostic standard. The primary outcome was the sensitivity of LUS and of CXR at identifying COVID-19 pneumonia against NCCT as the reference standard. Using a power analysis of 80%, our sample size calculation of 98 patients was based on previous data demonstrating a 20% difference in sensitivities between LUS and CXR at diagnosing pneumonia. Data are presented as proportions with 95% confidence intervals (CIs). Data analysis included the chi-square and t tests.

Results: 143 consecutive patients with signs and symptoms of COVID-19 were approached and enrolled. 27 patients were considered low risk by the attending EP per ED guidelines, and 6 patients were admitted for alternate diagnoses without advanced imaging. 110 patients underwent LUS, CXR, and NCCT. 99 LUS and 73 CXRs were interpreted as positive. 81 NCCT were interpreted as positive providing a prevalence of COVID-19 pneumonia of 75% (95% CI 66.0-83.2) in our study population. Sensitivity of LUS was 97.6% (95% CI 91.6-99.7) vs 69.9% (95% CI 58.8-79.5) for CXR. Specificity was 33.3% (95% CI 16.5-54.0) for LUS and 44.4% (95% CI 25.5-64.7) for CXR. LUS positive and negative likelihood ratios were 1.46 (95% CI 1.12-1.92) and 0.0723 (95% CI 0.01-0.31), respectively vs 1.26 (95% CI 0.87-1.81) and 0.67 (95% CI 0.39-1.16) for CXR. PPV and NPV for LUS were 81.8% (95% CI 72.8-88.9) and 81.8% (95% CI 48.2-97.7) compared to 79.5% (95% CI 68.4-88.0) and 32.4% (95% CI 18.0-49.8) for CXR.

Conclusions: LUS was more sensitive than CXR at identifying COVID-19 pneumonia. LUS using a portable, handheld ultrasound can be a valuable triage screening modality for patients with suspected COVID-19 pneumonia in diverse clinical settings.

7 Failure Rates during Reuse of Disposable N95 Masks in Clinical Practice in the Emergency Department

Check R, Kelly B, Rivard L, Pester J, McMahon K, Balakrishnan V, Jeanmonod D, Jeanmonod R/St. Luke's Hospital, Bethlehem, PA; St. Luke's University Health Network, Bethlehem, PA

Study Objectives: The COVID-19 pandemic caused a worldwide shortage of personal protective equipment, specifically disposable N95 respirators, prompting health care entities to extend the use of these masks beyond their intended single-use manufacturer recommendation with a paucity of supporting research. We sought to explore the failure rate when reusing single-use N95 respirators through repeated fit testing in an emergency department (ED).

Methods: We performed a prospective cohort study of ED personnel ("subjects") required to use respirators at an academic, level one trauma center. All investigators performing fit testing reviewed OSHA qualitative fit test guidelines and training and were familiar with the testing protocol. All subjects had been previously fit tested and assigned an appropriately sized N95 mask by employee health per hospital protocol. Subjects who failed initial fit testing and those who declined to participate were excluded. Per study protocol, subjects were fit tested periodically throughout their