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Interventions to Reduce Emergency Department Demand During a Pandemic

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Background

In contrast to the surge of sick patients and worried well that everyone initially feared would overwhelm hospitals, Emergency Departments (EDs) nationwide saw dramatic decreases in patient volume during the early stages of the COVID-19 pandemic. The EDs in Pennsylvania (PA) mirrored this trend. ED volume may have been impacted by governmental action at the federal, state, or local level, or by actions of health care institutions. This project describes the multitude of interventions taken by leadership in a PA health care network at over the course of the pandemic. The goal of the interventions was to prevent hospital resources from being overburdened. We further seek to describe a relationship between said interventions and ED volumes and patient acuity.

Methods

This IRB reviewed observational study identifies interventions, defined as recommendations or actions that change people's behavior or workflows, at national, state, local, and institutional levels. The health care system is a network which has 7 ED's, 1 of which is freestanding, and another is a dedicated pediatric ED. These interventions are linked temporally to changes in study parameters such as ED volumes and measures of ED patient acuity including Modified Early Warning Score (MEWS), Emergency Severity Index (ESI), and admission percentage. Statistical analysis was conducted using Minitab.

Results

Figure One demonstrates patient volumes plotted against governmental and institutional interventions. Volume decreased when the state of national emergency was declared, and further declined with the state-wide stay-at-home order and implementation of an institutional visitor screening policy. Of the ED sites, the pediatric ED saw the greatest census decline. The ED census at all locations began to recover around late May, coinciding with the re-starting of elective surgeries and movement of the county to the "yellow" phase of re-opening. Left without being seen (LWBS) trended down until this re-opening, when it increased but did not return to pre-pandemic levels. Figure Two demonstrates the increase in acuity, as measured by ESI and MEWS, over time.

Conclusion

This single network experience appears to link governmental interventions to ED volume. Here, pediatric volume appeared most sensitive, though this observation may not be generalizable to other pandemics. While volume decreased, acuity increased. This trend, and LWBS may be influenced by whether patients have other health care options. Provision of remote options such as video visits may be of value in future pandemics.

Figure One: ED Census Match with Interventions Over Time

Figure Two: ED Acuity as Measured by Overlay of ESI (1 & 2) and MEWS >2

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