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MEETING SUMMARY

Confronting COVID-19: Finding Hospital Capacity and Improving Patient Flow

A Webinar Series Hosted by PCORI for Hospitals and Health Systems

Part 2 – Dealing with the Emergency Department amid COVID-19

April 7, 2020

Overview

Faced with an imminent surge of COVID-19 patients, hospitals across the country are encountering enormous challenges with capacity and patient flow. Learning from clinicians, health system leaders, and operations management experts about how to manage capacity in real time can help health systems adapt to evolving circumstances surrounding the current pandemic.

On April 7, 2020, PCORI (the Patient-Centered Outcomes Research Institute) hosted "Part 2–Dealing with the Emergency Department amid COVID-19" of its webinar series. Emergency medicine leaders from health systems in Long Island, New York, and Northern California described what is occurring in their emergency departments (EDs) amid the COVID-19 outbreak.

The expert panel included the following individuals:

Speakers

- **Eric Morley, MD,** Clinical Director, Department of Emergency Medicine and Deputy Chief Medical Informatics Officer, Stony Brook Medicine
- **Peter Viccellio, MD,** Vice Chair, Department of Emergency Medicine and Associate Chief Medical Officer, Stony Brook Medicine
- **Karen Murrell, MD,** Clinical Solutions and Operations Advisor, Qventus; Director, Adventist Health Lodi Memorial, former Chair of Emergency Medicine, Kaiser Northern California

Moderator

Susan Dentzer, Senior Policy Fellow, Duke-Margolis Center for Health Policy

Discussants

- **Eugene Litvak,** President and Chief Executive Officer, Institute for Healthcare Optimization
- **Patricia Rutherford,** Vice President, Institute for Healthcare Improvement

Webinar recordings are available at www.pcori.org/confronting-COVID-19.

Dealing with the Emergency Department amid COVID-19

Although hospitals are at different stages of COVID-19 impact, hospital leaders in New York and California reported that their organizations are taking proactive steps to manage the increased demand on their EDs and the resulting flow of many very sick patients to other parts of these hospitals. In the following sections, we summarize the key strategies used to

manage this flow amid the pandemic, including how new systems were set up for this purpose, what challenges have arisen, and how they have been addressed.

COVID-19 Cases Treated to Date

New York. New York remains the epicenter of the COVID-19 pandemic in the United States, with the overall caseload for the state projected to be at or near the peak as of early April 2020. Stony Brook University Hospital, the flagship hospital of the Stony Brook Medicine system on New York's Long Island, saw its first person under investigation (PUI) in the ED for COVID-19 on February 7, 2020. Cases began to increase exponentially in early March and ballooned from 15 PUIs per day on March 9, 2020, to a peak of 250 PUIs per day on March 30, 2020. Initially, PUIs were asked questions about foreign travel to discern whether it was likely that they were positive for COVID-19. By the middle of March, however, all patients arriving at the hospital were assumed to be COVID-positive. Much of the routine business of the ED had slowed, with substantial declines in the number of patients seeking care for mental health disorders as well as other conditions such as appendicitis, kidney stones, and low back pain.

During March and into early April, Stony Brook saw weekly increases in COVID-19 cases. By the second week of April, the tide appeared to turn, and Stony Brook started to see the volume of patients being admitted stabilize and even drop. The ED team was cautiously optimistic that this declining trend would persist; however, they continued to prepare for surges and a possible rebound effect in later months if social or physical distancing protocols in the community were substantially eased, viral spread continued, and more patients became ill. They also continued to maintain expanded intensive care unit (ICU) capacity to support the high volume of patients on ventilators for extended periods.

California. In contrast, California had experienced lower volume through early April, with a peak in COVID-19 cases expected to occur between April 26, 2020, and May 11, 2020. California implemented physical distancing practices early on, which may explain why the current volume of COVID-19 cases was lower than expected, particularly in San Francisco. However, by the second week of April, cases in Los Angeles were beginning to peak, perhaps signaling an impending wave of cases on the west coast. Adventist Health Lodi Memorial, a community hospital within an integrated health system in California's Central Valley roughly 90 miles east of San Francisco, was taking cues from hospitals in New York to prepare for the expected wave of cases. At Lodi Memorial, 70% of patients with COVID-19 were classified as low acuity, meaning that they required less intensive care.

Linking the ED to Overall Incident Command

Integrating ED directors into the incident command structure. Early in March, Stony Brook developed an incident command structure following Federal Emergency Management Agency guidelines. The ED was integrated into the command structure, with the clinical director of the ED branch reporting directly to the medical director, who leads

incident command for the entire organization. Recognizing the critical role of the ED in determining the hospital's overall response to the crisis, the ED's clinical director worked closely with the hospital chief executive officer and chief medical officer beginning in February to secure support to keep patients flowing into and out of the ED. For Lodi Memorial, consistent interaction with hospital administration has been vital to coordinate incident command logistics.

Communicating with multiple leaders across systems. Both Stony Brook and Lodi Memorial have held daily incident command calls with administrators and staff across the system to discuss logistics and backup plans. Having multiple leaders within departments join these calls has been critical to verifying the information shared and establishing continuity in case staff become ill with COVID-19. Sharing information in a transparent way has helped to create a more coordinated response and to reduce fear and anxiety among staff.

Optimizing Patient Flow and Operational Capacity in the ED

Forward triaging to preserve ED space. External forward triaging has helped both hospitals reserve their main ED space for high-acuity patients who need more treatment and testing and to protect patients from being exposed to infection in busy waiting rooms. Stony Brook and Lodi Memorial set up field tents as alternative sites to safely screen and care for patients. Stony Brook initially used abandoned space intended to become a new care area as a forward triage area. After the number of patients increased from 9 on the first day to a peak of 154, forward triage moved to a field tent that included 20 beds for inpatient care.

Emergency medical services staff wearing personal protective equipment (PPE) greet patients in their cars upon arrival, ask screening questions about patients' comorbidities, and take vital signs. As of mid-March, all patients are given surgical masks as well. Patients are then put into two separate cohorts, or groups:

- Patients who can receive forward triage care as appropriate based on age, pulse oximetry greater than 94%, no immunosuppression, and no major cardio/pulmonary comorbid conditions
- Patients who require care in the regular ED

As of early April, about 70% of patients seen in the Stony Brook ED were discharged to home health care, 27% were admitted to the hospital, and 3% were immediately admitted to the ICU. Over time, many patients admitted to the medical/surgical areas of the hospital eventually required admission to the ICU; in fact, 10% to 15% of all hospital admissions eventually required ICU support.

Initially, patients receiving COVID-19 tests at Stony Brook were also tested for influenza and respiratory syncytial virus. However, the organization switched to COVID-only testing after

seeing that patients who tested positive for influenza were often co-infected with COVID-19. The new testing approach limits delays in obtaining test results and streamlines patient management.

When patients are sent home following screening and examinations, Stony Brook advises them to self-quarantine and return to the hospital only if their condition worsens. At Lodi Memorial, patients are often discharged with supplies such as thermometers, pulse oximeters, and home oxygen machines to self-monitor. Stony Brook, however, reports that these items are currently sold out or unavailable in the area.

Increasing capacity for inpatient care. To prevent an overflow of patients into the ED, and potentially to further reduce the risk of infection spread among patients, Stony Brook and Lodi Memorial took steps to increase ICU capacity rapidly—within days rather than weeks. (In New York state, all hospitals were ordered by the governor to double their overall bed capacity in late March.) A key step in maximizing and optimizing patient flow was to identify every space in the hospital that could house medical/surgical or ICU beds and to prepare these spaces for immediate use. Because all elective surgeries were canceled and many urgent surgeries were postponed, more beds were available for patients with COVID-19.

Increasing staffing capacity. In Stony Brook's ED, the regular ED staff were treating patients while other clinicians and those diverted from other parts of the labor force were being assigned throughout the hospital. Lodi Memorial, which also canceled elective surgeries, enhanced its ICU capacity by placing clinicians, who normally would have performed these surgeries, on standby for ICU support. Providers who did not typically care for critically ill patients needed training to provide optimal care for patients with COVID-19. Emergency medicine leaders consulted an online training program on critical care for non-ICU clinicians offered by the Society of Critical Care Medicine.

Optimizing Safe Examination and Treatment in the ED

Minimizing spread among COVID-positive patients and PUIs. Stony Brook sought to separate patients who were determined to have COVID-19 from patients who were suspected of having COVID-19 but doing so was challenging. Some PUIs were admitted to the hospital before their COVID-19 test results came back. Because these patients could not be placed in rooms with patients already known to be COVID-positive, many of the hospital's double rooms were effectively single rooms for a period, which led to a logjam, or backup, of patients in the ED. To solve this problem, Stony Brook looked for ways to speed turnaround of test results, such as by processing tests in-house in hospital labs or obtaining faster turnaround from external labs.

Consistently wearing PPE to reduce exposure. Early in the pandemic, before Stony Brook concluded that all patients should be presumed to be COVID-positive, some staff were not sufficiently protected when they examined patients and became ill from the virus.

As of mid-March, new protocols instructed all hospital staff to presume that all patients, regardless of symptoms or reason for the visit, are potentially infected with COVID-19 and to wear PPE—specifically, N95 masks—at all times during their shifts. Staff put an additional face shield or surgical mask over the N95 when they enter patients' rooms.

Wearing PPE protects staff not only from any aerosolized transmission of the virus but also from touching their faces or noses. To conserve PPE, staff on floors dedicated to treating patients with COVID-19 and those in the forward triage tent do not remove their gowns. Hospitals are using ultraviolet light, aerosolization, and hydrogen peroxide to disinfect PPE for reuse.

Managing the use of ventilators. To help maintain ventilator supply and improve patient outcomes, Stony Brook has been successful in putting some patients in need of breathing support on noninvasive devices, such as continuous positive airway pressure (CPAP) and bilevel positive airway pressure (BiPAP) machines rather than intubating them and putting them on full ventilator support. Stony Brook has also investigated, but not yet implemented, modifying its ventilators so that they can be used by two patients at a time. Anesthesia machines have also been adapted for ventilation use. Stony Brook and other hospitals are also employing less invasive techniques to improve oxygen flow such as routine self-proning by awake hypoxic patients.

Using telehealth in the ED. Hospitals are using videoconferencing tools to limit infection spread. Every room in the Stony Brook ED also has an iPad on a stand so that any doctors and other staff who do not need to be in the room can communicate with the patient remotely. Although patients receive in-person bedside evaluations whenever necessary, having remote conversations with patients reduces the number of times staff enter the room, which in turn also helps conserve PPE. The tablets allow palliative care specialists, discharge managers, and social workers to communicate directly with patients from remote locations without risk of exposure.

Participating in clinical studies of treatments. Hospitals are involved in several different clinical studies aimed at determining the effectiveness of treatments that are already being used widely, including hydroxychloroquine, antivirals, and convalescent plasma. Results of these studies are needed to support evidence-based recommendations.

Lessons Learned

Initiate planning and prevention steps early. Emergency medicine leaders described several steps that can be taken early:

- Train all staff on incident command procedures and plans.
- Train staff on PPE use, and instruct all staff to use PPE at all times, for all patients, throughout the hospital.

- Train staff and practice ahead of time on proper use of PPE and techniques for intubating patients to minimize the risk of exposure to the virus.
- Engage administration early and often to prepare a supply chain and to expand ICU capacity right away. In addition, create more negative pressure rooms, which will be needed for the use of BiPAP and CPAP machines.

Treat every patient as a possible COVID-19 patient or patient of interest. Any patient who comes to the hospital or ED, whether for an ankle sprain or a stroke, could be infected with COVID-19. Remember that one person could spread the virus to all other patients and staff.

Expect and prepare for the worst. A key lesson learned in New York was that having a few patients with COVID-19 on any one day was followed by a rapid escalation in cases. Organizations should be prepared for dramatic shifts in caseload within a short period of time. Plans for expanding inpatient and ICU capacity should be in place well ahead of need, with locations and staffing clearly established and ready to go.

Prioritize management of patient flow in the ED. It is essential that hospital administrators understand that the flow of patients into and out of the ED are critical factors that must be managed well for optimal response. External triage areas are critical during times of surge to ease ED burden and open high acuity beds. Work with local government agencies to secure resources such as disaster tents for field triaging and testing. Patients admitted to the hospital cannot be boarded in the ED because it creates an enormous hazard for both staff and patients waiting to be seen.

Consult available resources to apply learnings from others. Hospitals are encouraged to regularly track new developments and evidence of best practices as providers across the nation are sharing learnings. Designate staff in different departments to monitor and take ownership of various issues in which evidence is evolving rapidly such as in critical care of patients, PPE use, or Centers for Disease Control and Prevention guidelines. Dividing up responsibilities, such as managing PPE, communicating with ED staff at large, developing infrastructure or coordinating testing, or following guidance on PPE and medications, can help alleviate burden on the ED clinical director. Emergency medicine leaders mentioned two resources:

- **Podcast:** EM:RAP | Emergency medicine reviews and perspectives, available at https://www.emrap.org/
- **Blog:** EMCrit | Emergency Department Critical Care, available at https://emcrit.org/about/

Team-based applications are also helping hospital teams manage and share data.

Express gratitude and provide support for staff. These are unprecedented times, and despite their superior performance, hospital staff are anxious and worried about their own

safety as well as the safety of their family members and colleagues. ED physicians should consider personally thanking nurses and other staff at the end of shifts. Consistently having hospital leaders visit the floors, thank staff individually, and offer extra support such as meals and childcare, when possible, are meaningful ways to let staff know that their efforts are appreciated. Hospitals should also consider ways to support the mental health needs of staff after the pandemic, such as by offering telehealth for psychiatric services, which may be more comfortable for staff than confiding in local peers.