

When COVID-19 Strikes Your Hospital

As a hospitalist on the front lines of COVID-19, I know firsthand how the homeostasis of a hospital is altered when community cases of COVID-19 increase. For example, emergency departments immediately enact novel pathways and protocols for triage, evaluation, and admission (1). Hospitals begin to assess and enhance inpatient capacity, often by opening units not traditionally used for general medical care (for example, postoperative care units) as COVID-19-designated areas (2). Additional tactics, such as decreasing elective surgical cases, merging specialized intensive care units (ICUs), and offering staff moonlighting opportunities to increase critical care capacity, are also pursued. And in short order, hospital command centers spring up to monitor patient flow, streamline communication, and coordinate activities ranging from patient visitation policies to media releases (3).

These macro responses mask a slew of micro changes occurring in the interstices of the organization. For example, materials and technologies, such as hospital beds, mechanical ventilators, laboratory supplies, testing materials, personal protective equipment, and hemodialysis machines, are readied and resourced; human capital is actively assessed and enhanced; physicians, nurses, respiratory therapists, perfusionists, pharmacists, and a host of key actors are readied, while reinforcements in the form of traveling nurses, locums, and those who typically do not work in the hospital (such as primary care physicians) are called in. And critical operations, such as nutrition and food services, infection prevention, environmental services, laundry and sanitation, and the morgue, are prepared for what may lie ahead.

These system perturbations have significant consequences for those who provide clinical care. First of all, providers are marshaled to deal with an adversary they know little about. They are then asked to do so in unfamiliar areas of the building, with people they may never have worked with before. On top of this, new processes for critical clinical decisions, such as when to test for COVID-19, how to treat, when to intubate, or how to manage cardiac arrests, are introduced. As hospitals swell with cases and these rapid changes unfold, what happens to patients needing care for COVID-19?

In their study, Kadri and colleagues present findings from a nationally representative cohort of 144 116 hospitalized patients cared for in 558 hospitals to understand the effect of COVID-19 surges on patient outcomes (4). To capture the stress a hospital is under, the authors devised a unique surge index—a metric that encapsulated the strain a hospital experienced each month from COVID-19 volume in relation to baseline bed capacity. The index assigned weights to high-acuity functions (such as ICU care or mechanical ventilation), therefore factoring in the additional human capital needed to provide care. The authors also modeled the surge index over time, thus providing perspective on how therapeutic advancements (for example, corticosteroids) influenced outcomes during waves of the U.S. pandemic. The findings are sobering and provide

several lessons. First, we learn that clusters of high-surge index hospitals not only existed but varied across geography and time. Second, we witness the effect of therapeutics in the form of decreasing ICU admissions and mechanical ventilation rates. Third, we comprehend how detrimental COVID-19 surges were to clinical outcomes: After risk adjustment, patients cared for in the highest surge strata experienced 2-fold greater mortality than in hospitals not experiencing surges. The bottom line: Nearly 1 in every 4 deaths and almost 6000 total deaths may have been attributable to hospital strain due to COVID-19.

To be sure, there are caveats to these numbers. The surge index proposed by the authors, although logical, has not been validated in another data set. Also, the weighting of its parameters is debatable: Does a stably ventilated patient in an ICU really represent a 5-fold increase in hospital pressure compared with a patient with escalating oxygen needs who is not in an ICU? Finally, even though the effect of non-COVID-19 cases had no association with patient outcomes, inpatient volumes did not return to prepandemic levels during the study period (5). Thus, Kadri and colleagues' analyses may not capture the tightrope that many of us walk today as we balance COVID-19 and non-COVID-19 care.

How may we prevent the deleterious effects of future surges on patients? Key to such preparation is the understanding that waves of COVID-19 affect multiple hospitals; therefore, the current approach, which largely consists of "every hospital for itself," must be changed. Instead, we need a coordinated, regional approach to absorb the shock of rapid increases in COVID-19 volume. State health departments, payers, professional societies, and hospital associations are well positioned to lead this dialogue. Regional summits inviting hospital leaders to a morbidity and mortality-style assessment of local surges—dissecting what went well, what didn't, and why—are one approach to begin this type of discussion. In this setting, shared rules for decision making and processes to manage resource constraints for future surges could be jointly developed, as could approaches to seamless communication and information exchange. Similarly, shared learning platforms to understand how hospitals are managing COVID-19 care could be launched. One example of this type of program is the Mi-COVID19 initiative in Michigan, where Blue Cross Blue Shield of Michigan and Blue Care Network, the Michigan Health & Hospital Association, the Society of Critical Care Medicine, and 40 hospital systems came together to improve COVID-19 care (6). By collecting and analyzing granular hospital data during waves of the pandemic, sharing knowledge, and hosting weekly webinars at the height of the Michigan surge, the Mi-COVID19 initiative served as an amalgam for clinicians and hospital leaders across the state to tackle important questions ranging from therapeutic strategies and excess antibiotic use to provider wellness and long-term outcomes of COVID-19 survivors (7,8).

Besides patients, there are other victims when COVID-19 strikes hospitals: health care workers. And although some have raised their voices asking for change (9), surveys suggest that many are considering leaving the field after being battered by wave after wave of COVID-19 (10). It is all but certain that future surges, if managed using our current paradigm, will not only harm patients but also weaken the strength and resolve of our most precious resource: our people. Simply put, we owe it not only to our patients but also to our providers to come together when COVID-19 strikes. Kadri and colleagues' findings serve as powerful motivation to move away from the status quo.

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