

Different Pathways to the Most Difficult Decisions*

KEY WORDS: COVID-19; crisis standards of care; disaster; ethics; triage

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The COVID-19 pandemic has stressed health systems around the world to an unprecedented degree. In early 2020, enormous numbers of critically ill patients overwhelmed hospitals in China, Italy, Spain, and elsewhere. As the virus spread into North America, reports from New York, Seattle, and Los Angeles described the heroic efforts of hospital staff caring for profoundly sick patients not only in traditional ICUs but also in emergency departments, postanesthesia care units, operating rooms, or on the medical wards. Faced with such a crushing demand, clinicians and health systems were forced to ask once-unimaginable questions: what do we do when we run out of capacity? How do we decide who will receive the last ventilator?

In disaster triage, clinicians must identify those patients who are sick enough to benefit from critical care but not so sick as to have a low likelihood of survival. Triage is thus an important part of crisis standards of care (CSC), a response to a situation in which the needs of large numbers of patients exceed the resources available to meet them. The implementation of CSC, including triage protocols as described in the article by Knochel et al (1) in this issue of *Critical Care Medicine*, is an attempt to ensure that health systems provide the best possible care under the worst possible circumstances. In the United States, the Institute of Medicine stated in 2009 that adopting CSC during a disaster “is not optional—it is a forced choice, based on the emerging situation. Under such circumstances, failing to make substantive adjustments to care operations—i.e., not to adopt crisis standards of care—is very likely to result in greater death, injury, or illness (2).”

Given the stakes involved, it is not surprising that there is a wide diversity in approaches to CSC and triage taken in different jurisdictions, both national and regional. In the United States and Canada, most CSC plans have been developed by states and provinces, respectively; in Germany, CSC and triage policies have been developed at the federal level. The core principle of providing the best possible care is universal throughout all such systems, but the ethical emphasis may vary among jurisdictions. A system based on utilitarian ethics, for example, may emphasize providing the greatest good for the greatest number, whereas an egalitarian system may emphasize individual need and circumstances to larger degree (3). Balancing the collective good with a respect for equity remains a challenge, as we work to ensure that triage algorithms do not unjustly exclude vulnerable populations or exacerbate pre-existing inequities (4).

The moral burden of triage on the bedside clinician is heavy. In military settings, triage is usually performed by a triage officer who is distinct from the personnel who are directly treating a given injured patient. In most jurisdictions, disaster triage under CSC is conducted by triage teams who are similarly

*See also p. 1714.

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DOI: 10.1097/CCM.0000000000005691

removed from direct patient care. Two basic rationales exist for the use of these triage teams: 1) to reduce the moral distress from clinicians who would be forced to pick those patients to receive potentially lifesaving therapies (and those who would not) and 2) to maximize objectivity and minimize bias in decision-making (5). It is a potential concern that triage team members may experience moral distress comparable with that faced by bedside clinicians (6), suggesting that the team model could simply “displace” distress from one professional group to another.

The system in Germany differs in that the intensivists primarily responsible for the patient’s care are directly involved in triage decisions, rather than assigning those decisions to a separate team. The authors acknowledge the difference between their system and elsewhere. The stated motivation for this difference, to avoid abdicating their moral duties to their patients, is an admirable one that should resonate with most critical care professionals. A collaborative, consensus-based structure for triage decision-making with a team of attending intensivists may serve to ameliorate moral distress, one hopes. Additionally, it is possible that subtle prognostic features, such as how a patient “looks”, might be better captured when triage is performed by treating physicians. Issues of bias regarding factors such as age, race, and disability may be more challenging to address under this model, however, although the specific features of social inequity likely differ between the United States and Germany.

Proper triage requires a method for accurate prognosis. Thus far, we have not identified the best tool for the task. The German model, like many CSC plans in the United States, uses the Sequential Organ Failure Assessment (SOFA) score. SOFA scores at the time of initial presentation are reasonably predictive of hospital survival based on prepandemic ICU data, making it an acceptable method for developing ventilator allocation models. Unfortunately, initial SOFA scores appear to correlate poorly with survival in COVID-19, with one study identifying an area under the receiver operator curve (AUROC) of only 0.59, worse than the AUROC of 0.66 for age alone as a predictor of survival (7). This poor performance was further validated in a nationwide database of over 15,000 patients with COVID-19 requiring mechanical ventilation, for whom the pre-intubation SOFA score had an AUROC for survival

of 0.55–0.66, depending on whether the raw score or categorizing by strata (e.g., SOFA > 9) was used (8).

It is important to note that the system described by Knochel et al (1) does not rely on SOFA at presentation but rather over the course of an admission. Unfortunately, although changes in SOFA over time appear to be predictive of outcomes in a general critical care population (9), analyses in patients with COVID-19 do not support the prognostic value of serial SOFA measurements (10). These results, only slightly better than a coin toss, do not support the continued use of preintubation SOFA for prognostication in COVID-19.

If SOFA is not the answer for triage, what is? Prognostic models designed specifically for COVID-19, such as the International Severe Acute Respiratory Infection (ISARIC) 4C deterioration score (11), incorporate age with physiologic variables, with improvements in accuracy when measuring risk for in-hospital decompensation (AUROC 0.77); the 4C score and similar scores may be most effective at identifying patients at low risk for requiring critical care, however, rather than identifying those who are unlikely to survive. Frailty, as assessed by standardized instruments such as the Clinical Frailty Score, is predictive of survival in both general ICU populations and in COVID-19 specifically (12). In fact, bedside assessment by clinicians seems to be at least as good as the prevailing scoring systems, although intensivists may be distressed to learn that general internists could be better at gauging a patient’s likelihood of benefiting from the ICU than we are (13).

We must not extrapolate too much from the excellent article by Knochel et al (1). They describe a simulation exercise in a single hospital, with colleagues who presumably know one another and have a shared institutional culture. Given the simulation environment, some of the scenarios in their study (such as selecting exactly two patients per team thought to be less likely to survive) are naturally arbitrary. Nonetheless, what they demonstrate is that there may be multiple “correct” ways to operate a triage system ethically and well.

It is also possible, of course, that we have all been doing it wrong. Although COVID-19 hospitalizations in the United States, Canada, and Europe are at a low ebb as of late August 2022, we face ongoing system stresses from supply chain disruptions, staff shortages, and the impacts of deferred care on an overtaxed system. The scenario envisioned in our triage protocols, where

formal selection of patients for scarce resource allocation unfolded in a controlled manner, did not occur. Rather, patients arrived not in groups but sequentially; they were intubated when they needed to be intubated, and shortages arose when we ran out of space, staff, and supplies, but (usually) not of ventilators. We may need to shift our focus in triage and CSC away from the initial decision to intubate and instead look at time-limited trials of critical care, where we reassess patients' responses to therapy in during public health emergencies after a predetermined duration, with the resulting time and perspective hopefully improving our ability to prognosticate (14). Regardless, our future goal cannot be just to perfect our triage protocols; rather, we must do everything possible to "avoid" triage. We need to maximize our ability to operate under contingency conditions, improve medical supply chains, and preserve our strained work force (15). Health systems and critical care leaders around the world need to take this moment to reassess our crisis plans and to decide what was effective and what was not. This article (1), along with the work and sacrifices of so many others, will contribute to that honorable goal.

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Dr. Maves' institution received funding from Sound Pharmaceuticals and AiCuris; he received funding from Trauma Insights, LLC.

The opinions expressed in this article are those of the author and do not necessarily reflect the opinions of Wake Forest University or Atrium Health Wake Forest Baptist.

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