

Miller School Study Evaluates Predictive Value of Sequential Organ Failure Assessment Score across Patient Populations

The Sequential Organ Failure Assessment (SOFA) score, which hospitals commonly use to help predict which critically ill patients are likely to survive, is comparably accurate in patients with and without COVID-19 and across different races and ethnicities, according to a retrospective survey study by University of Miami Miller School of Medicine investigators that was published in the *Annals of the American Thoracic Society*.



SOFA scores were found to be highly accurate at predicting hospital mortality.

The COVID-19 pandemic has highlighted the need to accurately predict which patients are most likely to survive should the demand for acute care services exceed a hospital's resources, according to the study's lead author, Hayley B. Gershengorn, M.D., professor of pulmonary, critical care, and sleep medicine at the Miller School.

Hospital Crisis Standards of Care policies help clinicians triage resources to and away from patients at times of excess demand. SOFA is a cornerstone of resource allocation for many of these policies. But SOFA's predictive value by COVID-19 infection status and among racial/ethnic subgroups is not clear, according to Dr. Gershengorn.

Scientists first published on SOFA in 1996 to assess the potential for organ dysfunction and failure in patients with sepsis, an uncontrolled, generalized infection with a hyperimmune response. Severe COVID-19 is a type of sepsis, according to study author Tanira B.D. Ferreira, M.D., chief medical officer at the University of Miami Hospital and Clinics, and associate professor of pulmonary, critical care, and sleep medicine at the Miller School.

Exaggerated Response

"With COVID-19, you have an infection and an exaggerated host response to the infection," Dr. Ferreira said. "If what happened during the pandemic at hospitals in New York City, where they did not have enough beds for patients, should happen again, it is critically important that hospitals across

the nation have ways to predict which patients are most likely to die, regardless of COVID status, so that resources can be better allocated.”



Hayley B. Gershengorn,
M.D.

For the recently published SOFA study, Miller School investigators evaluated 20,045 hospitalizations, of which 1,894, or 9.5%, were COVID-19-positive. SOFA is calculated within the electronic health record system used by University of Miami Hospital and Clinics, and it is part of the health system’s Crisis Standards of Care policy.

The researchers found that maximum SOFA scores early during hospitalization were highly accurate at predicting hospital mortality among patients with and without COVID-19 and across race/ethnicity.

But it was not a perfect tool, according to Dr. Gershengorn.

“In summary, we found that SOFA is similarly able to pick out which patients are more likely to die relative to others, whether they have COVID-19 or not and independent of race or ethnicity.” Dr. Gershengorn said. “But SOFA is not as good at predicting the absolute risk of death for patients without COVID-19 as it is for those with the infection.”

Different Results

There remains much to learn about using SOFA as part of Crisis Standards of Care policies, as other studies have reported results that differed from the Miller School study, according to Dr. Gershengorn.

“It is important that we understand or explain some of these inconsistencies,” she said. “One explanation may be the population. We have a uniquely diverse population here at the Miller School. Another factor may be at what point during a patient’s clinical course the SOFA score is calculated. We assess people when we first meet them, but other institutions did so at different points in their care.”

Nevertheless, the Miller School paper, published in in one of the most prestigious scientific journals in the specialty of pulmonary critical care, offers valuable insight at a time when the nation’s hospitals are trying to answer the question of how to optimally and equitably triage critically ill patients when resources are limited, according to Dr. Ferreira.

Ideal Setting

The Miller School is an ideal setting for a study looking at patient race and ethnicity, according to Dr. Gershengorn.



Tanira B.D. Ferreira,
M.D.

“One of the amazing things about the Miller School is the diversity of patients,” she said. “We want to make sure that patients of all races and ethnicities are represented in work like this.”

The Miller School’s Crisis Standards of Care policy is a model policy for Florida Hospital Association members. In a study published March 19 of this year in *JAMA Network Open*, Dr. Gershengorn and colleagues analyzed more than 1,000 medical records from University of Miami hospitals and found no racial disparities in how the Miller School’s Crisis Standards of Care policy prioritizes patients.

The paper’s authors are members of the UHealth-Data Analytic Research Team (DART), which quantitatively analyzes the impact of quality projects at UHealth hospitals. Other Miller School authors and DART team members include: Samira Patel, M.B.A.;

Bhavarth Shukla, M.D., M.P.H., assistant professor of clinical medicine and medical director of infection control and employee health at UHealth; Prem R. Warde, M.S.I.E.; Shane M. Soorus, M.S.N., RN; Gregory E. Holt, M.D., Ph.D., assistant professor of medicine; Daniel H. Kett, M.D., professor of critical care medicine and director of the medical ICU at UHealth Tower; and Dipen J. Parekh, M.D., chief clinical officer and professor and chair of urology and the Victor A. Politano Endowed Chair in Urology.

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