

SOFA Score: What it is and How to Use it in Triage

Updated December 21, 2020

This document has been updated with additional information and lessons learned from the Novel Coronavirus pandemic and additional disasters since the original publication date. Changes are noted in red and with the change date noted (December 21, 2020).

What is the SOFA Score?

The Sequential Organ Failure Assessment (SOFA) score is a scoring system that assesses the performance of several organ systems in the body (neurologic, blood, liver, kidney, and blood pressure/hemodynamics) and assigns a score based on the data obtained in each category. The higher the SOFA score, the higher the likely mortality.

Why was the SOFA Score Developed?

The SOFA score was designed as a research tool so that groups of patients (e.g., those with sepsis, and infection in the bloodstream which can lead to shock and death) could be categorized based on their risk of death. SOFA is quite accurate when used in sepsis cases and when applied to groups of patients. For example, if 100 severely ill septic patients requiring intensive care unit (ICU) treatment have a SOFA score greater than 11, over 90% of them will die (Vincent et al., 1996). One benefit of SOFA is that it requires only six common points of data to calculate. Comparable predictive systems require much more data.

What are the Limitations of SOFA?

Because SOFA was designed to look at populations, and not individual patients, it cannot accurately predict which patients will survive when the mortality rate is high (i.e., if mortality is 90%, which 10 patients will survive) or which patients will die if the mortality rate is low. Some of the factors used in scoring can be difficult to assess depending on the care being provided (e.g., it is difficult to assess a level of coma when a patient is receiving sedatives) and some of the medications listed are no longer used routinely (e.g., low dose dopamine or dobutamine). Though SOFA was developed for sepsis research and has been validated in additional settings, there is concern that it does not accurately predict mortality when used for patients with isolated respiratory failure as demonstrated during the 2009 H1N1 pandemic. In fact, very few patients with primary respiratory failure generate SOFA scores over 4-6, severely limiting its utility in a pandemic/epidemic and potentially biasing against patients with other conditions. An additional limitation is that elevated baseline creatinine, and in particular pre-existing end-stage renal disease, can cause the score to be falsely elevated in relation to actual mortality. (December 21, 2020)

Who is Using SOFA Now?

SOFA has been recommended (along with a less validated, more clinical tool called “quick SOFA” or qSOFA) for assessment of patients with sepsis by the new [2016 Sepsis Definitions Consensus Statement \(Sepsis 3\)](#), though it is not usually used outside of larger, academic centers. While the clinical utility of SOFA in daily practice is unproven, many states have included SOFA in their crisis standards of care plans as an element of the triage framework for scarce resources.

What is the Advantage of Using SOFA for Triage?

SOFA creates a standardized, numeric score that is familiar to critical care physicians. Physicians can use it to compare patient status and the score has been shown to have a significant correlation with outcome **in certain conditions. This can be helpful for the clinical teams as a comparative factor. (December 21, 2020)** Of the scoring systems available, SOFA achieves a good balance between easily available data and good prediction. When calculated daily it can also be used to establish trends in the individual patient’s course, **although patients with respiratory failure from viral pneumonia and other causes may not show improvement and may, in fact, worsen over the first several days of hospitalization. (December 21, 2020)**

What are Some Challenges with Using SOFA for Triage?

SOFA was developed to be used with populations and though it is good at determining overall mortality, the score cannot predict individual mortality well. Clinicians should not use the SOFA score in isolation to exclude a patient from receiving interventions. The predictive value of the score also depends on the disease state. Finally, SOFA is well-validated in adults, but not in children. **As previously discussed, SOFA scores in primary respiratory failure are usually low, and therefore will not assist in the triage process. (December 21, 2020)**

Let’s say that a group of patients is being admitted to the ICU that are so sick that half will die despite ICU care. In this group a SOFA score of >11 will correlate well with a >90% chance of death and be potentially very helpful in making decisions. But, patients admitted to an ICU during an influenza pandemic would have a much better chance of living than that. So if we assume they have a 10% chance of dying then the SOFA score’s accuracy would fall to the point where only *half* of those with a SOFA score >11 would die – meaning you might as well flip a coin than use the data for triage. These articles provide more discussion and specifics: “[An observational cohort study of triage for critical care provision during pandemic influenza: ‘clipboard physicians’ or ‘evidenced based medicine’?](#)”; “[A modified sequential organ failure assessment score for critical care triage](#)”; and “[MSOFA: An important step forward, but are we spending too much time on the SOFA?](#)”

How Should the SOFA Score be Used in Triage?

It is best to use the SOFA score when comparing patients and deciding how to best allocate resources. Regardless of exact performance, a large difference in SOFA scores does certainly correlate with general prognosis, so a patient who scores a 2 is much more likely to survive than a patient who scores an 11, and may preferentially receive resources unless there are other medical conditions or factors that affect the prognosis. The new suggestions on critical care triage from the [American College of Chest Physicians](#) are consistent with this strategy, which is also reflected in the [Minnesota Department of Health clinical cardset](#) (Patient Care Strategies in Scarce Resource Situations) where SOFA is included among other considerations in a comparative framework.

States that are developing, or have developed, triage frameworks should ensure that if SOFA is used, it is done so to compare patients competing for the same resource, or to follow patients daily for trends ([Ferreira, et al. 2001](#)). SOFA is *not* used as a screening tool to determine who will receive care or interventions.

It is important to remember that SOFA is a single criteria, and other patient factors (e.g., underlying diseases and current response to treatment) **must (December 21, 2020)** be taken into account when making triage decisions. Disease-specific predictive factors (**December 21, 2020**) also need to be accounted for and included in the triage decision-making. **When available, disease-specific prognosis information is far more helpful in most cases than general SOFA scores whose predictive value varies greatly across a range of conditions. (December 21, 2020)** Assuring that the triage team members **or the clinical consultants (December 21, 2020)** are experienced critical care providers that have access to the relevant patient information, guidance, and are part of a defined, structured process for triage whenever possible is critical to making fair, accountable, transparent decisions about resource allocation.

The SOFA Score*

Organ System, Measurement	SOFA Score				
	0	1	2	3	4
<i>Respiration</i> PaO ₂ /FiO ₂ , mmHg	Normal	<400	<300	<200 (with respiratory support)	<100 (with respiratory support)
<i>Coagulation</i> Platelets x10 ³ /mm ³	Normal	<150	<100	<50	<20
<i>Liver</i> Bilirubin, mg/dL (μmol/l)	Normal	1.2-1.9 (20-32)	2.0-5.9 (33-101)	6.0-11.9 (102-204)	>12.0 (<204)
<i>Cardiovascular</i> Hypotension	Normal	MAP<70 mmHg	Dopamine ≤5 or dobutamine (any dose)**	Dopamine >5 or epinephrine ≤0.1 or norepinephrine ≤0.1	Dopamine >15 or epinephrine >0.1 or norepinephrine >0.1
<i>Central Nervous System</i> Glasgow Coma Score	Normal	13-14	10-12	6-9	<6
<i>Renal</i> Creatinine, mg/dL (μmol/l) or Urine output	Normal	1.2-1.9 (110-170)	2.0-3.4 (171-299)	3.5-4.9 (300-440) or <500 mL/day	>5.0 (>440) or <200 mL/day

* Source: Vincent et al., 1996.

**Adrenergic agents administered for at least 1 hour (doses given are in mcg/kg/min).

For More Information

For annotated resources to assist with crisis standards of care planning, access [ASPR TRACIE's Crisis Standards of Care Topic Collection](#).