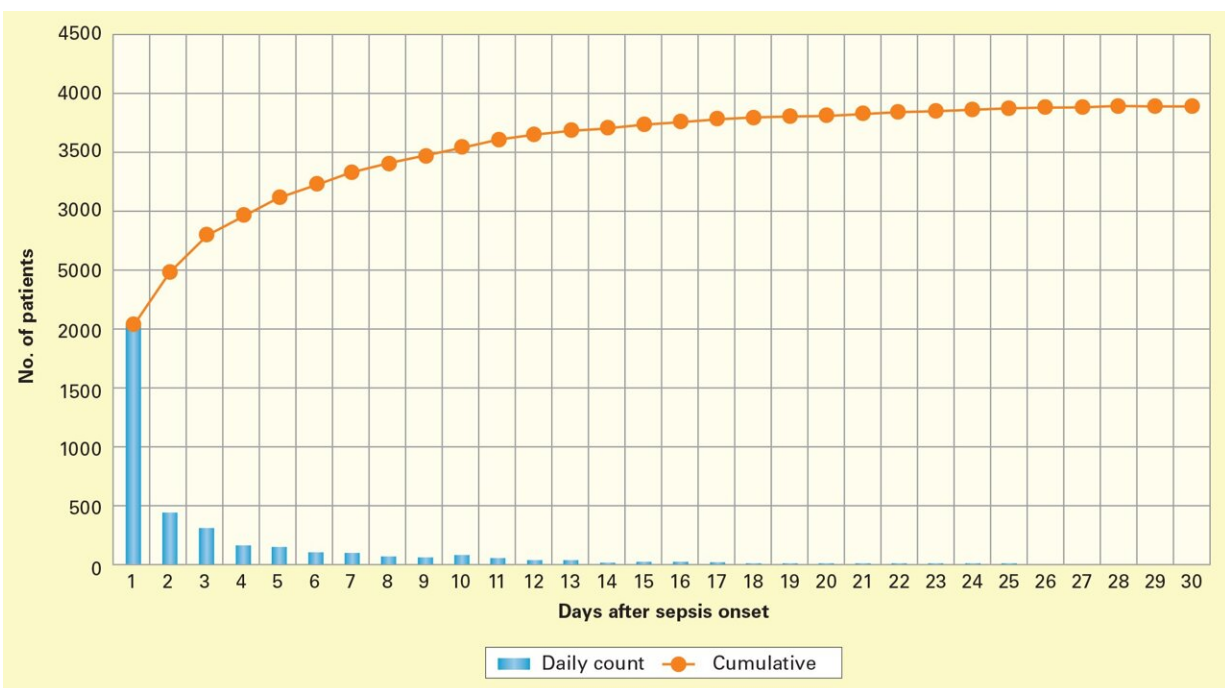


Study finds 13.5% of adult patients with sepsis required initiation of mechanical ventilation

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The number of patients with sepsis requiring mechanical ventilation, from the date of onset of sepsis to 30 days. Credit: *American Journal of Critical Care* (2023). DOI: 10.4037/ajcc2023299

An analysis of 10 years of health data showed that risk factors for needing mechanical ventilation changed for patients with newly diagnosed sepsis as more time passed after onset.

In the study, 13.5% of patients with a new diagnosis of sepsis required initiation of mechanical ventilation. More than half of these patients required mechanical ventilation within the first 24 hours after sepsis onset, while initiation of mechanical ventilation occurred after 24 hours in 47.4% of patients.

"Factors Associated With Initiation of Mechanical Ventilation in Patients With Sepsis: Retrospective Observational Study" examined 10 years of data from the University of Michigan Medical Center electronic health data warehouse. The analysis included [adult patients](#) with sepsis who were not receiving mechanical ventilation at sepsis onset. The study is published in the *American Journal of Critical Care (AJCC)*.

Co-author Robert Freundlich, MD, MS, MSCI, is an associate professor, department of anesthesiology, and chief of the anesthesiology informatics research division at Vanderbilt University Medical Center, Nashville, Tennessee. The research was conducted during his research fellowship in [critical care](#) at the University of Michigan, Ann Arbor.

"Requiring mechanical ventilation is often a pivotal point for patients with sepsis, and their risk of respiratory failure may vary with time," he said. "Identifying patients at high risk and implementing targeted interventions in a timely manner has the potential to significantly improve outcomes."

A total of 35,020 patients met sepsis criteria, and 28,747 patients were eligible for inclusion after exclusion criteria were applied. The dataset spanned July 10, 2009, to Sept. 7, 2019.

Of all eligible patients, 3,891 (13.5%) required mechanical ventilation within 30 days after sepsis onset. Of these, 2,046 (52.6%) required mechanical ventilation within 24 hours of diagnosis. Mechanical ventilation was subsequently initiated for 441 (11.3%) patients from one

to two days after sepsis onset, and for 312 (8.0%) patients from two to three days following diagnosis. The remaining 1,092 (28.1%) experienced late respiratory failure or required mechanical ventilation three to 30 days after diagnosis.

Patients requiring mechanical ventilation had higher baseline illness severity and a higher prevalence of 27 of the 35 comorbidities on the Elixhauser Comorbidity Index, which measures overall severity of comorbidities.

They also had a higher in-hospital mortality rate (21%) than patients who did not require mechanical ventilation (7%). Further analysis revealed that of the patients who received mechanical ventilation before but not after [sepsis](#) onset, only 35 (4% of 822) died prior to hospital discharge.

Factors that were independently associated with an increased likelihood that mechanical ventilation would be needed included race, systemic inflammatory response syndrome (SIRS) score, Sequential Organ Failure Assessment (SOFA) score and congestive heart failure. Risks decreased with time for the SOFA score and [congestive heart failure](#) and varied with time for four comorbidities and three culture results.

The researchers recommend future proactive studies focus on the effects of fluid resuscitation and other processes of care on the need for mechanical ventilation in this patient population. The use of noninvasive [ventilation](#) and high-flow nasal cannula may also impact the need for intubation and [mechanical ventilation](#) and should be evaluated.

More information: Robert E. Freundlich et al, Factors Associated With Initiation of Mechanical Ventilation in Patients With Sepsis: Retrospective Observational Study, *American Journal of Critical Care* (2023). [DOI: 10.4037/ajcc2023299](https://doi.org/10.4037/ajcc2023299)

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