

Sepsis increased risk of heart failure and rehospitalization after hospital discharge

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People who are discharged after a hospitalization involving sepsis were at greater risk of cardiovascular events, rehospitalization for any cause or death during a maximum follow-up of 12 years compared to those hospitalized and did not have sepsis, according to new research published today in the *Journal of the American Heart Association*.

Sepsis is a leading cause of hospitalization and death worldwide. Each year in the U.S., about [1.7 million people](#) develop sepsis, an extreme immune response to an infection in the bloodstream that can spread throughout the whole body and lead to organ failure and possibly death.

"We know that infection may be a potential trigger for [myocardial infarction](#) or heart attack, and infection may also predispose a patient to other cardiovascular events, either directly during infection or later when the infection and related effects on the body promote progressive cardiovascular disease," said lead study author Jacob C. Jentzer, M.D., FAHA, an assistant professor of medicine in the department of cardiovascular medicine at the Mayo Clinic in Rochester, Minnesota. "We sought to describe the association between sepsis during hospitalization and subsequent death and rehospitalization among a large group of adults."

In this study, researchers examined whether adults who had sepsis may have a higher risk of death and a higher risk of rehospitalization for cardiovascular events after hospital discharge. They queried a database containing administrative claims data and identified more than 2 million enrollees of commercial and Medicare Advantage insurance across the U.S. who survived a non-surgical hospitalization of two nights or more between 2009 and 2019. Of these patients, who were ages 19-87 years, the medical claims indicate more than 800,000 had sepsis during their hospital stay. The researchers analyzed the association of hospitalization with sepsis, rehospitalization and death over a follow-up period from 2009 to 2021.

Because variations in sepsis diagnosis and documentation may affect outcomes in research and clinical treatment, researchers included two standard diagnosis codes used for sepsis: explicit and implicit. Explicit sepsis means a physician formally diagnosed the patient. Implicit sepsis is an administrative code in the electronic health record given

automatically when a patient has both an infection and organ failure, which is the currently accepted definition of sepsis. The presence of either definition of sepsis was used to classify patients as having sepsis versus no sepsis.

To focus on the potential cardiovascular impact of sepsis, researchers compared 808,673 hospitalized patients who had sepsis to 1,449,821 hospitalized patients who did not develop sepsis but still had cardiovascular disease or one or more [cardiovascular disease](#) risk factors (older age, hypertension, hyperlipidemia, type 2 diabetes, [chronic kidney disease](#), obesity or smoking).

The analysis found:

- Compared to patients who did not have sepsis during their [hospital stay](#), those with sepsis were 27% more likely to die, 38% more likely to be rehospitalized for any cause and 43% more likely to return to the hospital specifically for cardiovascular causes in the 12 years after having sepsis.
- Heart failure was the most common major cardiovascular event (including stroke, [heart attack](#), arrhythmia and [heart failure](#)) among people who had sepsis. People who had sepsis while hospitalized had a 51% higher risk of developing heart failure during the follow-up period.
- Patients with implicit sepsis (infection with [organ failure](#)) had a two-fold increased risk of rehospitalization for cardiovascular events compared to those with explicit sepsis (formal diagnosis by a physician).

"Our findings indicate that after hospitalization with sepsis, close follow-up care is important, and it may be valuable to implement cardiovascular prevention therapies with close supervision," Jentzer said. "Professionals need to be aware that people who have previously had sepsis are at very

high risk for [cardiovascular events](#), and that it may be necessary to advise them to increase the intensity of their cardiovascular prevention."

The study authors will continue to evaluate new data on people who have previously had sepsis during hospitalization in order to map out their needs for cardiovascular prevention therapies. "It's an important opportunity to establish what might and might not work in the future for people who have had sepsis," Jentzer said.

The main limitation of the study is that it is a retrospective cohort study that uses data gathered through hospital administration. This meant that researchers were assessing past records and did not have information on the severity of [sepsis](#).

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More information: Cardiovascular events among survivors of sepsis hospitalization: A retrospective cohort analysis, *Journal of the American Heart Association* (2023). [DOI: 10.1161/JAHA.122.027813](https://doi.org/10.1161/JAHA.122.027813)

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