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**Persistent Inflammation After Hospital Discharge Linked to Higher Mortality and Readmission in Sepsis Survivors**

**PITTSBURGH, August 7, 2019** – One out of four sepsis patients who survive their hospital stay have elevated levels of inflammation a year after discharge, and they are at higher risk for major health problems and death, according to a study led by physician-scientists at the [University of Pittsburgh School of Medicine](https://www.medschool.pitt.edu/) and the [Veterans Affairs Pittsburgh Healthcare System](https://www.pittsburgh.va.gov/).

The results, published today in [*JAMA Network Open*](https://jamanetwork.com/journals/jamanetworkopen), give tantalizing clues to future treatments that may improve outcomes for sepsis survivors.

[Sepsis](https://www.upmc.com/media/news/pitt-upmc-redefine-sepsis) is a life-threatening condition that arises when the body’s response to an infection injures its own tissues and organs, and affects more than 30 million people worldwide every year, according to the [World Health Organization](https://www.who.int/news-room/fact-sheets/detail/sepsis).

“Sepsis is the leading cause of death among hospitalized patients. Patients discharged from the hospital aren’t out of the woods yet. Approximately 1 out of every 3 sepsis survivors will die in the following year,” said lead author Sachin Yende, M.D., M.S., professor of [critical care medicine](https://www.ccm.pitt.edu/) and [clinical and translational science](https://ctsi.pitt.edu/) at Pitt’s School of Medicine, and vice president of critical care and deputy chief of staff at the [Veterans Affairs Pittsburgh Healthcare System](https://www.pittsburgh.va.gov/services/critical-care.asp). “Our new findings about chronic inflammation post-discharge suggest that addressing this condition may be important to improve patients’ long-term outcomes.”

Nearly all patients with sepsis have increased inflammation in their bloodstream during the first few days of their hospitalization. Whether this inflammation resolves or persists is poorly understood. Yende and his team followed 483 people who had been hospitalized with sepsis at one of 12 U.S. hospitals between 2012 and 2017, and survived to be discharged. Detailed information was gathered on the study participants, and they were contacted by telephone and home visits three, six and 12 months after enrollment for health interviews and a blood sample.

Approximately a quarter of the participants showed persistently elevated levels of inflammation and a half showed elevated levels of immunosuppression biomarkers up to a year after hospitalization. These patients had higher rates of readmission, particularly due to heart disease and stroke, and death compared to their peers whose inflammation and immunosuppression biomarkers had returned to normal after hospitalization.

“The participants with increased inflammation had levels that were twice as high as levels in healthy individuals and that elevated inflammation persisted long after hospital discharge,” said senior author [Derek Angus, M.D., M.P.H.](https://www.upmc.com/media/experts/derek-c-angus), professor and chair of Pitt’s Department of Critical Care Medicine and director of [Pitt’s Clinical Research, Investigation, and Systems Modeling of Acute Illness (CRISMA) Center](https://ccm.pitt.edu/CRISMA). “Sepsis increases risk of heart disease and stroke, and, for the first time, we’ve linked these adverse outcomes to persistent inflammation. This opens the door to future studies into why high levels of inflammation persist for at least a year after hospital discharge and the development of treatments aimed at modifying the inflammation with the hope that will improve health.”

The researchers cautioned that they did not have blood tests on the study participants before their sepsis diagnosis. It is possible that they had elevated levels prior to hospitalization that may have contributed to the development of sepsis and continued to persist after hospitalization.

Additional authors on this research are John A. Kellum, M.D., Victor Talisa, M.S., Octavia M. Peck Palmer, Ph.D., Chung-Chou H. Chang, Ph.D., and Anne B. Newman, M.D., M.P.H., all of Pitt; Michael R. Filbin, M.D., M.S., of Massachusetts General Hospital; Nathan I. Shapiro, M.D., M.P.H., of Beth Israel Deaconess Medical Center; Peter C. Hou, M.D., of Brigham and Women’s Hospital; Arvind Venkat, M.D., of Allegheny Health Network; Frank LoVecchio, M.D., of Maricopa Medical Center; Katrina Hawkins, M.D., of George Washington University; and Elliott D. Crouser, M.D., of The Ohio State University Wexner Medical Center.

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**About the University of Pittsburgh School of Medicine**

As one of the nation’s leading academic centers for biomedical research, the University of Pittsburgh School of Medicine integrates advanced technology with basic science across a broad range of disciplines in a continuous quest to harness the power of new knowledge and improve the human condition. Driven mainly by the School of Medicine and its affiliates, Pitt has ranked among the top 10 recipients of funding from the National Institutes of Health since 1998. In rankings recently released by the National Science Foundation, Pitt ranked fifth among all American universities in total federal science and engineering research and development support.

Likewise, the School of Medicine is equally committed to advancing the quality and strength of its medical and graduate education programs, for which it is recognized as an innovative leader, and to training highly skilled, compassionate clinicians and creative scientists well-equipped to engage in world-class research. The School of Medicine is the academic partner of [UPMC](http://www.upmc.com/Pages/default.aspx), which has collaborated with the University to raise the standard of medical excellence in Pittsburgh and to position health care as a driving force behind the region’s economy. For more information about the School of Medicine, see [www.medschool.pitt.edu](http://www.medschool.pitt.edu).

**About VA Pittsburgh Healthcare System**

VA Pittsburgh Healthcare System is one of the largest and most progressive Veterans Health Administration facilities in the nation. More than 3,700 employees serve nearly 80,000 Veterans ever year, providing a range of services from complex transplant medicine to routine primary care. The health care system is a leader in virtual care delivery through telehealth technology. And it is a center of research and learning, with more than 300 active research projects and $30 million in funding, and a robust training program through which nearly 600 residents and students rotate annually.

Medical centers are located in Oakland and O’Hara Township, and outpatient clinics in Beaver, Fayette, Washington and Westmoreland counties in Pennsylvania, and Belmont County in Ohio.

Veterans can check on their eligibility and enrollment by calling 412-822-2040. Visit [pittsburgh.va.gov](http://pittsburgh.va.gov) and [facebook.com/vaphs](http://www.facebook.com/vaphs).

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