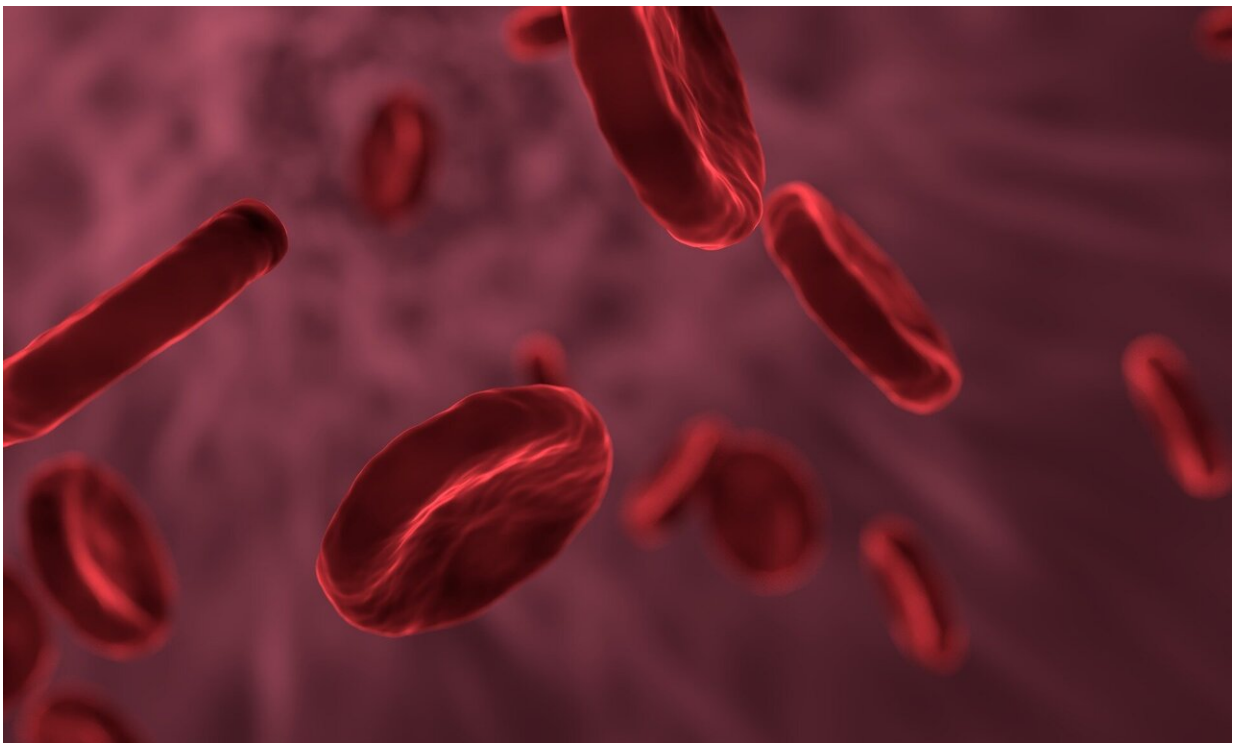


Comprehensive patient blood management program can reduce use of transfusions, improve patient outcomes

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A growing number of hospitals have implemented patient blood management programs to reduce unnecessary blood transfusions and costs. A study published in *Mayo Clinic Proceedings* finds that such a

program can not only substantially reduce transfusion use, but also reduce length of hospital stays and in-hospital adverse outcomes.

The [observational study](#) reviewed 400,998 hospital admissions from 2010 to 2018 at two Mayo Clinic hospital campuses. Allogenic [transfusion](#) use—meaning transfusions where the patient receives donated blood—and [clinical outcomes](#) were assessed, and during the study time frame, allogenic transfusions decreased from 607 to 405 per 1,000 admissions. Transfusion reductions were noted across medical and surgical admissions and for all major surgery types except liver transplantation, which were unchanged. Hospital length of stay and adverse events were lower than projected.

Reducing or eliminating unnecessary allogenic transfusions is increasingly important at a time when donor blood is in short supply, as has been true during the COVID-19 pandemic. Unnecessary transfusions also are associated with poor patient outcomes, according to the study.

"These efforts were associated with substantial reductions in transfusion utilization, including an absolute risk reduction of 6% for receiving any transfusion during hospitalization and an approximate 25% reduction in the number of blood products transfused beyond projections," says Matthew Warner, M.D., an anesthesiologist and critical care physician at Mayo Clinic, who is first author of the study. "We also observed a modest decrease in adverse events during hospitalization, such as myocardial infarction, stroke, venous thromboembolism, acute respiratory failure and transfusion reactions."

A patient blood management program is a multi-faceted approach to educational and clinical practices designed to improve the blood health of hospital patients. At Mayo Clinic, a patient blood management program was initiated in the cardiac surgery area more than 15 years ago, and a broader clinical approach was initiated at Mayo Clinic in

Rochester in 2012. The program is directed by physicians and nurse coordinators from the Department of Anesthesiology and Perioperative Medicine. The program includes what's called a Transfusion DataMart, which collects and validates data relating to transfusion therapies, making it available for analysis and coordinated action.

The study tracked admissions at Mayo Clinic Hospital, Methodist Campus and Saint Marys Campus, with a total of 2,059 licensed beds. A total of 30,052 units of blood were transfused in 2010, compared with 20,926 units in 2017, a reduction made possible by eliminating transfusions in some cases and reducing the number of units transfused in others. For surgical patients, the annual rate of transfusions per 1,000 cases decreased from 762 to 480 over the study period.

Among the factors that likely drove these reductions are widespread education efforts regarding evidence-based transfusion utilization, direct engagement with medical and surgical service lines, the use of computerized order entry processes that improve decision-making, and analytics that provide direct feedback to the ordering provider regarding his or her practices in relation to peers.

Hospital length of stays were 15% lower than projections during the study period, and in-hospital adverse events were reduced more modestly. The article cautions that changes in clinical outcomes may have occurred independent of changes in transfusion practices.

Secondary to the reduction in unnecessary transfusion use and improved outcomes are the conservation of blood resources and reduced costs. The article estimates that about \$7 million is saved annually secondary to reductions in transfusion-associated costs alone.

"This study adds to the growing body of evidence regarding the value of multidisciplinary patient blood management programs in reducing

unnecessary [blood](#) transfusions and improving patient outcomes," says Dr. Warner, who co-directs the Mayo program along with Daryl Kor, M.D., a Mayo Clinic anesthesiologist.

"There are many factors that make these reductions possible, including practice-wide educational efforts to ensure that the most current transfusion guidelines are being used, but it all begins with institutional commitment and a team-based approach," Dr. Kor says. "While creating a comprehensive program takes time, resources and dedication, many aspects are easy to implement and can have a profound impact on transfusion utilization."

The study was supported by grants from the National Center for Advancing Translational Science and the National Heart, Lung and Blood Institute. Dr. Kor is on the Scientific Advisory Board of Terumo Medical Corp., and a consultant with Instrumentation Laboratory, UpToDate and the National Institutes of Health. No other author reports a potential competing interest.

More information: Matthew A. Warner et al, Implementation of a Comprehensive Patient Blood Management Program for Hospitalized Patients at a Large United States Medical Center, *Mayo Clinic Proceedings* (2021). [DOI: 10.1016/j.mayocp.2021.07.017](https://doi.org/10.1016/j.mayocp.2021.07.017)

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