

# Outcomes of administering blood transfusions to patients with lower levels of hemoglobin

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Restricting red blood cell (RBC) transfusions among hospitalized patients to those with hemoglobin (the iron-containing protein in RBCs) measures below a certain level is associated with a lower risk of health care-associated infections, according to a study in the April 2 issue of *JAMA*.

Efforts to prevent health care-associated [infection](#) are among the priorities for the U.S. Department of Health and Human Services. The estimated annual direct medical costs of health care-associated infections to U.S. hospitals ranges from \$28 billion to \$45 billion, with about 1 in every 20 inpatients developing an infection related to their hospital care. Transfusion of RBCs is a common inpatient therapy, with approximately 14 million units transfused in 2011 in the United States, according to background information in the article. One potential approach to reducing the risk of infection associated with transfusions is lowering the hemoglobin thresholds (levels) at which RBC transfusions are indicated, so-called restrictive threshold strategies. The association between RBC [transfusion](#) strategies and health care-associated infection is not fully understood.

Jeffrey M. Rohde, M.D., of the University of Michigan, Ann Arbor, and colleagues compared restrictive vs liberal RBC transfusion strategies to evaluate their association with the risk of health care-associated infection. The study consisted of a review and meta-analysis of the data

from 21 randomized trials with 8,735 [patients](#) who underwent transfusion; 18 trials (n = 7,593 patients) contained sufficient information for inclusion in the meta-analyses. The main outcomes measured for the analysis were the incidence of health care-associated infection such as pneumonia, mediastinitis (inflammation of tissue in the chest cavity), [wound infection](#), and sepsis.

The researchers found that for those patients receiving the restrictive transfusion strategies, the risk of infection (for all serious infections) was 11.8 percent, and for patients receiving the liberal transfusion strategies, was 16.9 percent. Even with a reduction in the level of white blood cells (via the processing of blood), the risk of infection remained reduced with a restrictive strategy. The meta-analysis of randomized trials suggested that for every 1,000 patients in which RBC transfusion is under consideration, 26 could potentially be spared an infection if restrictive strategies were used.

The authors found no significant differences in the incidence of infection by RBC threshold for patients with cardiac disease, the critically ill, those with acute upper gastrointestinal bleeding, or for infants with low birth weight. The risk of infection was lower in patients undergoing orthopedic surgery or with sepsis and who received a restrictive transfusion strategy.

The authors write that the results of this review provide further support to a recent systematic review and clinical practice guideline put forth by the AABB (formerly the American Association of Blood Banks), that recommends adherence to a restrictive transfusion strategy for the majority of hospitalized patients and lists specific hemoglobin-based recommendations for different patient populations.

Jeffrey L. Carson, M.D., of the Rutgers Robert Wood Johnson Medical School, New Brunswick, N.J., comments on this study in accompanying

editorial.

"The only outcome evaluated in the report by Rohde et al was infection risk. However, other important outcomes such as mortality, myocardial infarction, and function should be considered in the overall risk-benefit analysis of transfusion."

"The study by Rohde et al confirms another potential adverse outcome associated with transfusion: serious infectious disease. Clinical trials are needed to establish the optimal transfusion thresholds, to provide additional information about the risks and benefits of RBC transfusion, and to determine how best to use RBC transfusion."

**More information:** [DOI: 10.1001/jama.2014.2726](https://doi.org/10.1001/jama.2014.2726)  
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