

# Anemia negatively affects recovery from traumatic brain injuries

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N. Scott Litofsky, M.D., chief of the University of Missouri School of Medicine's Division of Neurological Surgery, led a study to determine anemia's role in the recovery from traumatic brain injuries. Credit: Justin Kelley/MU Health

Approximately half of patients hospitalized with traumatic brain injuries are anemic, according to recent studies, but anemia's effects on the

recovery of these patients is not clear. Now, researchers from the University of Missouri School of Medicine have found evidence that anemia can negatively influence the outcomes of patients with traumatic brain injuries.

"More research is needed to develop treatment protocols for anemic patients with traumatic brain injuries," said N. Scott Litofsky, M.D., chief of the MU School of Medicine's Division of Neurological Surgery and lead author of the study. "Anemia occurs when there is a shortage of [red blood cells](#), which causes reduced oxygen flow to vital organs throughout the body. There has been a lack of consensus among physicians regarding the relationship of anemia and traumatic brain injuries on a patient's health. Because of this uncertainty, treatment protocols are unclear and inconsistent. Our observational study found that a patient's outcome is worse when he or she is anemic."

Red [blood](#) cells contain hemoglobin, a protein crucial to the delivery of oxygenated blood. The researchers studied the outcomes of 939 [traumatic brain injury](#) patients with anemia admitted to the Frank L. Mitchell Jr., M.D., Trauma Center, a Level I trauma center that is part of MU Health Care. The researchers compared hemoglobin levels of these patients and their outcomes within one year of surgery.

Despite also having more severe head and systemic injuries, patients with lower levels of hemoglobin had a poor outcome. For each increase in hemoglobin of 1 gram above 7 grams per deciliter of blood, the likelihood of a good outcome increased by 33 percent.

To restore a patient's [hemoglobin](#) level, a patient can receive a blood transfusion. However, stored blood may not perform as well as a patient's own blood, and patients may experience allergic reactions or viral infections as a result of the transfusion. Additionally, the cost of one unit of blood ranges from \$200 to \$300.

"The purpose of this study is not to propose transfusion guidelines, but rather to show that anemia can be harmful to patients with traumatic brain injuries," Litofsky said. "Now that we have shown that [anemia](#) affects a patient's recovery, further studies are needed to determine the best way to correct it. The ultimate goal of this research is to help [patients](#) recover more quickly from traumatic brain injuries."

The study, "The Negative Impact of Anemia in Outcome from Traumatic Brain Injury," was presented at the recent 84th American Association of Neurological Surgeons Annual Scientific Meeting. The research also was recently published by the peer-reviewed journal *World Neurosurgery*. Research reported in this publication was supported by the MU School of Medicine and the MU Department of Surgery. The researchers have no conflicts of interest to declare related to this study.

Provided by University of Missouri-Columbia

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