Blood transfusions still overused and may do more harm than good in some patients

Johns Hopkins study shows wide variation in transfusion use in operating rooms

Baltimore, Maryland, USA (April 24, 2012) - Citing the lack of clear guidelines for ordering blood transfusions during surgery, Johns Hopkins researchers say a new study, published online in the American Journal of Critical Care, showed that frequent use of transfused blood in patients who don’t need it.

The resulting overuse of blood is problematic, the researchers say, because blood is a scarce and expensive resource and its use can have serious consequences, including infection, stroke, and death. "Transfusion is the No. 1 risk to surgical patients," says Steven M. Frank, M.D., leader of the study described in the journal Anesthesiology.

"Over the past five years, studies have supported giving less blood than we used to, and our research shows that physicians might be responding," says Frank. "This year, in studies published in the New England Journal of Medicine, researchers showed that physicians are using less blood than they used to, and in the current study, we showed that the variation among physicians is still wide variation in the use of transfusions and frequent use of transfused blood in patients who don’t need it."

The exceptions, Frank says, are cases of trauma, hemorrhage or both, where infusing blood quickly can be lifesaving.

The recent studies, Frank says, support that physicians are waiting and waiting longer before transfusing patients who need this intervention. "This year, in studies published in the New England Journal of Medicine, researchers showed that physicians are using less blood than they used to, and in the current study, we showed that the variation among physicians is still wide variation in the use of transfusions and frequent use of transfused blood in patients who don’t need it."

The study examined 34,000 surgical cases at Johns Hopkins Hospital. Physicians were grouped into quartiles, with each quartile divided into two smaller groups. The researchers looked at whether physicians were giving less blood and whether this change was associated with better outcomes. They found that patients who received less blood recovered more quickly and had fewer infections than patients who received more blood, and that hospitals that gave less blood had better outcomes.

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A Department of Health and Human Services committee complained last year of "both excessive and inappropriate use of blood transfusions" in U.S. hospitals. The committee noted that "blood transfusions are associated with significant costs and risks to the patient. Over the past five years, studies have supported giving less blood than we used to, and our research shows that physicians might be responding."

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For example, patients undergoing cardiac surgeries received blood at much lower trigger points compared to patients... or above 10 grams per deciliter. The amount of blood transfused, Frank says, doesn’t clearly correlate with how sick the patients were or with how much blood is typically lost during specific types of surgery. Blood is lost during many operations, though hemoglobin levels don’t often fall to the point where blood transfusion is necessary, he says.

Blood transfusion, which introduces a foreign substance “transplant” into the body, initiates a series of complex immune reactions that can suppress the immune system, which increases the risk of infections, including pneumonia and sepsis, he says. Frank also cites a study showing a 42 percent increased risk of cancer recurrence in patients having cancer surgery who received transfusions.

Blood is in short supply and pricey, says Frank. It costs $278 dollars to buy a unit of blood from the American Red Cross. The hospital pays as much as $1,100 for the nonprofit to acquire, test, store and transport. Medicare pays just $180 for that unit of blood.

The decision about when to give a blood transfusion during surgery is made jointly by the surgeon and theesthesiologist, but it is the responsibility of theesthesiologist to determine the level. Frank says. The surgeon and theesthesiologist may have different standards about when a transfusion is necessary. Recommendations for transfusion trigger points should be made before surgery, since it is too late to be making decisions when the surgery is under way, he says.

Frank’s research at Johns Hopkins produced a list of blood use and trigger points for each individual surgeon and anesthesiologist. Frank met with the Hopkins surgeons to explain how and why he used data to develop the guidelines he implemented in hospitals. The surgeons agreed to use the guidelines and adapt them based on evidence and experience. To do so requires both knowing what to do and how to make decisions.

Frank presented his work to Johns Hopkins’ Department of Surgery. The surgeons and the anesthesiologists who had been trained to transfuse when hemoglobin levels fell below 10 agreed to try a new protocol of transfusing when the hemoglobin level fell to 7 or 8. In the two months before their conversation, 30 percent of that surgeon’s patients got blood transfusions. In the two months after, only 18 percent did.

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"A lot of our practices are just handed down through the generations," Frank says. Although Frank’s study focuses only on one hospital, he says the lack of consistent guidelines for ordering blood puts patients at risk all over the country.

Coming up with an exact algorithm for the timing of blood transfusion is impossible, as each situation and each individual surgery is different. But Frank believes what is best for patients is to strive to transfuse less whenever possible.
Other Johns Hopkins researchers involved in the study include Will J. Savage, M.D.; Jim A. Rothschild, M.D.; Richard J. Rivers, M.D.; Paul M. Ness, M.D.; Sharon L. Paul, B.S., M.S.; and John A. Ulatowski, M.D., Ph.D., M.B.A.