Blood Transfusions Overused And May Do More Harm Than Good

Citing the lack of clear guidelines for ordering blood transfusions during surgery, Johns Hopkins researchers say a new study confirms there is still wide variation in the use of transfusions and 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 because recent studies have shown that surgical patients do no better, and may do worse, if given transfusions prematurely or unnecessarily. "Transfusion is not as safe as people think," 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 practitioners have not caught up," says Frank, an associate professor of anesthesiology and critical care medicine at the Johns Hopkins University School of Medicine. "Blood conservation is one of the few areas in medicine where outcomes can be improved, risk reduced and costs saved all at the same time. Nothing says it's better to give a patient more blood than is needed."

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

General guidelines from three different medical societies govern when a surgical patient should get blood, but they tend to be vague, Frank says. In a healthy adult, a normal hemoglobin level — the quantity of red blood cells carrying oxygen through the body — is roughly 14 grams per deciliter. The guidelines state that when a patient's hemoglobin level falls below six or seven grams per deciliter, a patient will benefit from a transfusion, and that if the levels are above 10, a patient does not need a transfusion. But when blood levels are in-between, there has been little consensus about what to do.

The recent studies, Frank says, suggest that physicians can safely wait until hemoglobin levels fall to seven or eight before transfusing, even in some of the sickest patients.

A Department of Health and Human Services committee complained last year of "both excessive and inappropriate use of blood transfusions in the U.S.," noted that "blood transfusion carries significant risk that may outweigh its benefits in some settings," and stated that misuse adds unnecessary costs.

For the new study, Frank and his colleagues examined the electronic anesthesia

records of more than 48,000 surgical patients at The Johns Hopkins Hospital over the 18 months from February 2010 to August 2011. Overall, 2,981 patients (6.2 percent) were given blood transfusions during surgery. The researchers found wide variation among surgeons and among anesthesiologists, compared to their peers, and how quickly they order blood.

For example, patients undergoing cardiac surgeries received blood at much lower trigger points compared to patients having other surgeries. Patients undergoing surgery for pancreatic cancer, orthopedic problems and aortic aneurysms, on the other hand, received blood at higher trigger points, often at or above 10 grams per deciliter. The amount of blood transfused, Frank says, did not 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. Patients often develop antibodies to transfused red blood cells making it more difficult to find a match if future transfusions are needed. Transfused blood also has a suppressive effect on 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, for example, and 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 the anesthesiologist, but it is the responsibility of the anesthesiologist to administer the blood, Frank says. The surgeon and the anesthesiologist may have different opinions about when a transfusion is necessary. Discussions about transfusion trigger points would ideally 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 recently told the Hopkins surgeon who uses blood most often that he held that distinction and explained the reasons he might want to wait until hemoglobin levels are lower before ordering a transfusion. 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.

After Frank presented his research to Johns Hopkins' Department of Surgery, the director told the surgeons assembled that although most of them were trained to transfuse when hemoglobin levels fall below 10, transitioning to a trigger of seven or eight made sense.

"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.

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