

Improving safety for blood transfusions

Case Study

In the two years orthopaedic surgeon Gavin Pittman, MD, has been with Regions Hospital, his department's transfusion rate for hip and knee replacement has dropped from 20 percent to 5 percent of patients.

Based on the latest medical evidence, the hospital's Orthopaedic and Sports Medicine Department has made several changes to avoid unnecessary blood transfusions.

First, they followed the lead of Regions Intensive Care Unit, and lowered the threshold that triggers a transfusion to 7.0 grams per deciliter (g/dl). "Two years ago, if a patient was at 8.2 g/dl, we'd transfuse two units," Dr. Pittman says. "Today, we might not transfuse at all, or if the patient was symptomatic, we'd start with one unit of blood and then repeat the hemoglobin lab test to determine if the patient was back within a safe range."

The other change Dr. Pittman implemented was using a topical medication on wounds to help stabilize clots, so patients aren't losing as much blood through small vessels. Combined, he says these changes have lowered the complication rate for hip and knee replacement surgeries and reduced the number of unnecessary blood transfusions.

Evidence-based guidelines for blood use prevent unnecessary use

HealthPartners and Regions Hospital are involved in an initiative of the Institute for Healthcare Improvement to develop models of care that simultaneously accomplish three objectives: improve health, deliver excellent consumer experience and reduce the cost of care.

This report details one initiative to achieve these three aims by preventing unnecessary blood transfusions and reducing the amount of donated blood used during transfusions whenever possible.

The challenge

Increased risk of complications

Blood transfusions can save lives. Blood transfusion is the most common procedure in U.S. hospitals¹, but growing research shows that transfusions temporarily suppress the immune system and can increase medical complications. One three-year study² of 11,855 surgical patients who received one unit of red blood cells compared with a matched set of 11,855 non-transfused patients showed that blood transfusions were associated with increased medical complications and longer hospital stays.

Complication	No transfusion	Transfusion
Mortality	5%	6%
Wound problems	10%	11%
Sepsis	8%	11%
Length of stay	10 days	12 days

Wide variation in use

Transfusions of red blood cells, platelets, plasma and other blood products were approved decades ago without research to establish optimal levels. Historically, practice has been to transfuse one or two units of red blood cells when a patient's hemoglobin, which carries oxygen in the blood, falls below 10g/dl.

Nationally, the rate of blood transfusions varies widely which indicates that there is overuse and inappropriate use of blood. One study³, for example, found that the transfusion rate for knee replacement varied from 6 to 32 percent, and the rate for hip replacement surgery varied from 11 to 41 percent.

Number of donors limited

Screening donors for travel, medication, disease and high-risk behavior limits the number of people who are eligible to donate blood. As a result, less than 40 percent of the population is eligible to give blood according to the American Red Cross. While the nation's blood supply is currently adequate, it is important to conserve blood, as the number of eligible donors is expected to shrink as donor criteria becomes stricter and the population ages.

The solution

To improve safety, conserve the blood supply and reduce costs, Regions partnered with the American Red Cross to implement an evidence-based blood use strategy. The initiative is designed to prevent blood transfusions for patients who don't need them and to ensure that patients who do need one get the right dose at the right time.

Consistent with clinical guidelines⁴ Regions reduced the point at which doctors initiate transfusion, called the hemoglobin trigger, to < 8 g/dl in stable patients. A tool built in to the electronic medical record automatically provides these criteria to physicians at the point of order.

Results

- Blood use decreased by 94 units per month or 14 percent
- 1,131 patient transfusions were avoided
- Reduced blood costs by \$229,593
- In 2012, 20 percent of heart surgery patients received a blood transfusion; a decrease from 35-50 percent in 2011

The 2013 Regions Hospital Transfusion Committee campaign encourages giving one unit of blood and evaluating a patient before infusing a second unit and lowering the hemoglobin trigger to 7 g/dL.

A 2012 analysis of blood use by 464 hospitals determined that if all hospitals adopted best practices for blood use, we could save more than 802,000 units and \$165 million in costs without a decline in patient outcomes. The analysis was conducted by Premier, a national health care collaborative dedicated to improving quality.

About HealthPartners

Founded in 1957, HealthPartners is the largest consumer-governed, non-profit health care organization in the nation. It is dedicated to improving the health of its members, patients and the community. It serves more than 1.4 million medical and dental health plan members nationwide. Its care system includes more than 1,700 physicians, more than 60 dentists, five hospitals, 52 primary care clinics, 22 urgent care locations, 21 dental clinics and numerous specialty practices in Minnesota and western Wisconsin. HealthPartners also provides medical education and conducts research through its Institute of Education and Research.

1. Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project, Statistical Brief #149, Feb. 2013

2. Ferraris, VA, et al. Arch Surg 2012;147:49-55

3. Thurer RL, Lambert C, Parce P, Parrell S, Popovsky MA. Variability in transfusion practice - beyond cardiac surgery. Transfusion 2012; 52 (suppl):121A

4. AABB, Red Blood Cell Transfusion: A Clinical Practice Guideline Annals of Internal Medicine July 3, 2012 Vol. 157, No. 1