

Blood management guidelines can reduce blood wastage and save millions of dollars

July 17 2016

Improving the processes of ordering, transporting, and storing blood can save millions of dollars and drastically reduce blood wastage, reported a research team from one academic medical center after implementing institutional initiatives to address blood management. The multidisciplinary team at Vanderbilt University Medical Center, Nashville, Tenn., developed blood utilization practice guidelines that resulted in \$2 million in savings and a 30 percent reduction in blood utilization, according to a poster presentation at the 2016 American College of Surgeons National Surgical Quality Improvement Program (ACS NSQIP) Conference in San Diego.

"The transfusion committee at Vanderbilt was interested in evaluating how we could implement evidence-based guidelines around restrictive transfusion," according to lead study author Barbara J. Martin, MBA, RN.

The first step the team at Vanderbilt took to better utilize blood transfusion practices was to change provider orders to support a single unit and then follow up and order more blood if necessary. The previous standard process was to initially order two units of blood, which is not always needed. Study authors noted that it is common practice at many hospitals to reflexively order a transfusion based on habit, rather than assessment.

According to study authors, blood transfusions increase the risk of complications—including transfusion reaction, infection, volume

overload, increased length of stay, and, even, mortality—associated directly and indirectly with the transfusion.

"The data on restrictive transfusion has been out for years documenting that patients have better outcomes with a more restrictive transfusion strategy. We were looking at whether we could guide providers to treat symptomatic anemia with a single unit of blood rather than the usual two units," Ms. Martin said.

By enhancing the Computerized Provider Order Entry (CPOE), the research team allowed for blood ordering practices to be based on a specific assessment of each case rather than a standard order of two units. By revising CPOE, Vanderbilt was able to reduce red blood cell transfusions by more than 30 percent—from 675 units per 1,000 discharges in 2011 down to 432 units per 1,000 discharges in 2015.

Study authors reported that for general and vascular surgery patients who underwent NSQIP targeted procedures—including colectomy, proctectomy, ventral hernia, and appendectomy—between 5 and 6 percent were transfused with an average of 2.4 units of blood per patient in 2015, compared with 11 percent transfused with an average of 4.6 units of blood per patient in 2011.

"With regard to surgical populations, one of the questions we had with our NSQIP data, where we track the number of units patients receive in the perioperative time period, was whether we would see similar decreases in blood utilization in the NSQIP population," said Ms. Martin. "We found that in that particular population, many of whom are transfused for acute blood loss, we still saw a significant decrease in the number of units transfused into the patient."

In addition to addressing blood utilization, the Vanderbilt team also looked at how to reduce blood wastage. To reduce inefficiencies in the

ordering, transport, and storage of blood, the team developed guidelines for perioperative handling:

- When more than one unit of blood is ordered it is sent in a cooler rather than the pneumatic tube.
- Coolers were reconfigured to optimize temperature management.
- A specific member of the staff is tasked with "ownership" of the blood products, including returning unused product to the blood bank.
- Individual unit wastage is reported to clinical leaders for review; aggregate data are reported monthly.

The improvements in blood utilization at Vanderbilt resulted in fewer than 80 units of blood being wasted in 2015, down from 300 in 2011.

Ms. Martin said that the guidelines they developed could easily be implemented at other medical centers. However, she noted, "You have to prioritize what your initiatives are. At Vanderbilt we had a lot of opportunities with blood transfusion and blood wastage and we made huge gains. Any incremental improvement would take additional resources."

"We were able to change the mindset of the entire institution, initially, and then determine that the improved usage with decreased wastage was beneficial to patient outcomes is a huge success for the team, the institution, and most importantly, the patients," according to study coauthor Oscar Guillaumondegui, MD, FACS, associate professor of surgery and Vanderbilt's NSQIP Surgeon Champion.

Beyond the benefits for an individual [medical center](#) of reducing blood wastage and utilization, Ms. Martin said there are also broader implications for the way blood donations are viewed. "Blood is a limited resource and we have a responsibility as a health care provider to

optimize the use of a resource that is difficult to get and only available through altruistic donations," she said. She also noted that using blood more effectively could have the ability to reassure donors that their blood is being used as sensibly and appropriately as possible.

Ms. Martin said that the efforts at Vanderbilt to optimize [blood](#) utilization were possible because of their multidisciplinary team approach. Involved in the project were administrative leadership, executive leadership, nursing staff, physicians, and house staff, among others.

Provided by American College of Surgeons

Citation: Blood management guidelines can reduce blood wastage and save millions of dollars (2016, July 17) retrieved 6 May 2024 from <https://medicalxpress.com/news/2016-07-blood-guidelines-wastage-millions-dollars.html>

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