**A SINGLE INSTITUTION CARDIAC INITIATIVE TO CUT BLOOD USE DURING CARDIAC SURGERY**

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The purpose of this quality improvement initiative was to develop and implement blood conservation strategies to minimize blood transfusions in patients undergoing cardiac surgery.

At the University of Vermont Medical Center (UVMMC) 70% of cardiac surgical patients were being transfused in 2012. Review of data from the Northern New England Cardiovascular Disease Study Group (NNEDSG), showed UVMMC blood use to be in the top quartile in the country. To better understand the contributing factors an internal quality database was established to comprehensively analyze patient records. To reduce the rate of blood transfusions, a surgeon led multidisciplinary blood conservation committee was instituted. The committee used a team approach to make practice changes to reduce transfusions during cardiac surgery. Practice changes included careful use of suction before, during and after bypass, reduced crystalloid volumes pre-bypass, reverse autologous priming of the pump circuit (RAP), shorter 3/8” venous line circuits, and vacuum assisted venous drainage.

Following implementation of these strategies, 2018 data from the Society of Thoracic Surgery (STS) showed UVMMC intra-operative homologous transfusion rate decreased to 6%. This allowed us to drop banked blood in the OR from four units to two units per case-saving $40,000 per year in blood handling costs. Analysis of 2019 data from the UVMMC quality database showed an intra-operative and post- operative transfusion rate of 18%. This included data for packed red cells, plasma and platelets, through twenty four hours in SICU. There was little cost to achieve these results, but there was significant team effort to educate and transform practices so that less blood was lost during a procedure.

Research by Rannucci and others has shown improved outcomes with higher hematocrits and less transfusion. Average nadir hematocrits remain 26% or higher on bypass for the past three years, and last hematocrit in the operating room averages 29% in 2019. The average arrival hematocrit in SICU has risen to 33% for 2019 (UVMMC quality database). Acute kidney injury has fallen from 7.0%% in 2012 to 2.1% in 2018 (NNEDSG). Stroke rate dropped from 2.1% in 2015 to 0.7% in the last 500 patients (NNEDSG). The cost of blood products has dropped significantly.

Data from the NNEDSG showed an opportunity to do a better job of conserving blood and we utilized case details from an internal quality database to help guide improvement efforts. Through the establishment of a blood conservation committee and involving all team members in changing practices, homologous blood transfusion decreased by 75% in UVMMC cardiac patients requiring cardiopulmonary bypass. This correlates with improved outcomes, but this reduction in morbidity cannot be shown to be directly related to reduced blood loss and lower blood product utilization.