Reducing Avoidable Blood Transfusions in Patients Admitted to Critical Care and High-Risk Surgical Units: A Stepped-Wedge, Population-Based Implementation Trial

Sampson Law[1,2,3], Karen Shariff[4], Sarah Seymour[1], Sara Pretzlaff[4], Kate Vogelaar[4], Susan Nahirniak[5,6], Areej Hezam[7], Melissa Gardiner[8], Tara Whitten[9], Michelle Van Beek[4], Selvi Sinnadurai[4], Katelynn Crick[1], Ashleigh Jensen[1], Geer Ma[1], Daniel J Niven[7,2,3] on behalf of the Don't Misuse My Blood Investigators and the Critical Care Strategic Clinical Network

1 - Physician Learning Program, Department of Continuing Medical Education and Professional Development, University of Calgary, Calgary, Canada
2 - Department of Community Health Sciences, Cumming School of Medicine, University of Calgary, Calgary, Canada
3 - O'Brien Institute of Public Health, Cumming School of Medicine, University of Calgary, Calgary, Canada
4 - Critical Care Strategic Clinical Network, Alberta Health Services
5 - Provincial Transfusion and Transplantation Medicine, Alberta Precision Laboratories
6 - Faculty of Medicine and Dentistry, University of Alberta, Edmonton, Canada
7 - Department of Critical Care Medicine, Cumming School of Medicine, University of Calgary and Alberta Health Services, Calgary, Canada
8 - Critical Care and Data Quality | Provincial Inpatient Clinical Services – IT, Alberta Health Services
9 - Provincial Research Data Services (PRDS), Data & Analytics, Alberta Health Services and Alberta SPOR SUPPORT Unit, Data and Research Services

Themes: Individual and team improvement, Partnered system improvement activities, Application of research to practice, Audit and feedback, Data access and data harms, Implementation science, Knowledge translation, Quality improvement

What you need to know

Patients admitted to critical care and high-risk surgical units are frequently prescribed blood component transfusions. While this is common for appropriate indications, Alberta data suggests that upwards of 60% of transfusions might be avoidable.

What is this project about?

This project developed and implemented an intervention to reduce avoidable blood components (red blood cells, plasma, platelets, fibrinogen and prothrombin complex concentrate) used for patients admitted to critical care and high-risk surgical units in Alberta, Canada.

What did the team do?

This study employed a stepped-wedge, registry-based design to deliver a multi-modal implementation science intervention to **32 critical care units and 7 high-risk surgical units**. Critical care units included: 15 ICUs, 12 CCUs, 2 adult CVICUs, 2 pediatric ICUs and 1 pediatric CVICU. High-risk surgical units included post-operative units for cardiac, vascular and trauma surgical patients.

The intervention was developed by a multidisciplinary team of experts:

Step 1	• Determinants underpinning inappropriate transfusions were used to guide intervention composition. The intervention included inter-professional education, clinical decision support tools, key-opinion leaders and audit and feedback
Step 2	• A clinical decision support tool to guide blood component utilization was created
Step 3	• The intervention was implemented at 4 sites per month over 10 months. The EPIC electronic information system served as the registry for the trial and blood component utilization data was mapped to appropriateness guidelines; this formed the basis of the audit and feedback reports, provided to units on a quarterly to bi-annual basis depending on their utilization

Results

The intervention has been implemented at 33 units, and the remaining units will be implemented by June 11, 2024. **Potentially low-value RBC transfusions have decreased by a relative 27% (17.1% to 12%) after intervention**, with no change seen at sites where rollout has not been initiated.

Conclusion

Reducing low-value care requires complex multi-modal implementation science interventions developed and implemented by teams of experts.

Acknowledgments

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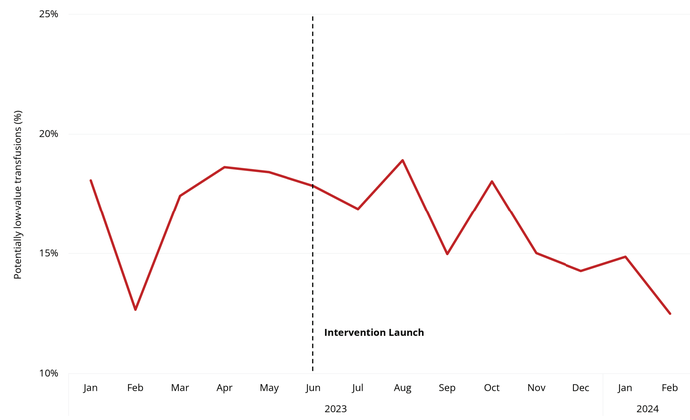
Contact daniel.niven@albertahealthservices.ca

DMMB Preliminary Outcomes

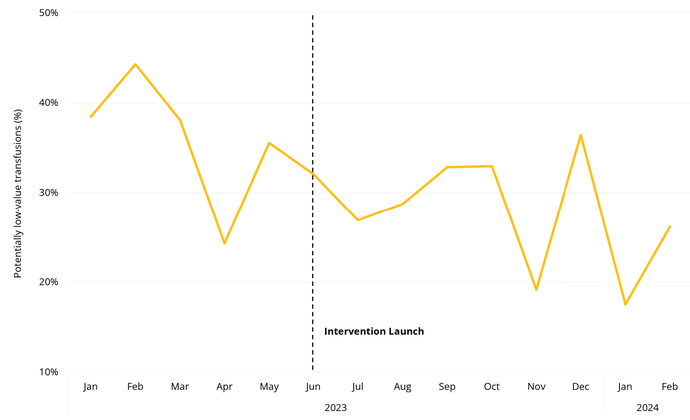
Red Blood Cell Transfusions

↓ 27.1%



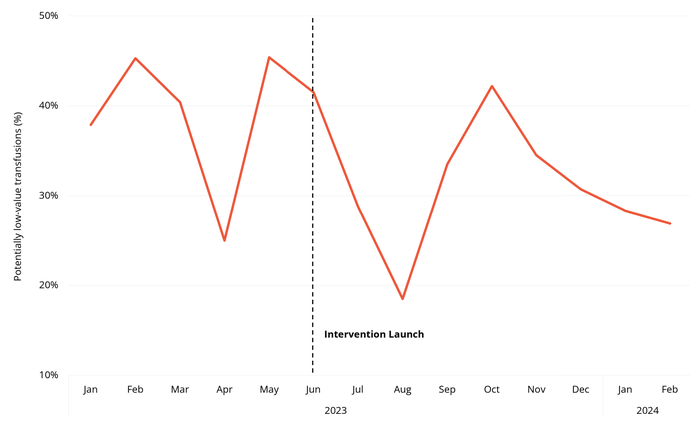
Plasma Transfusions

↓ 22.7%



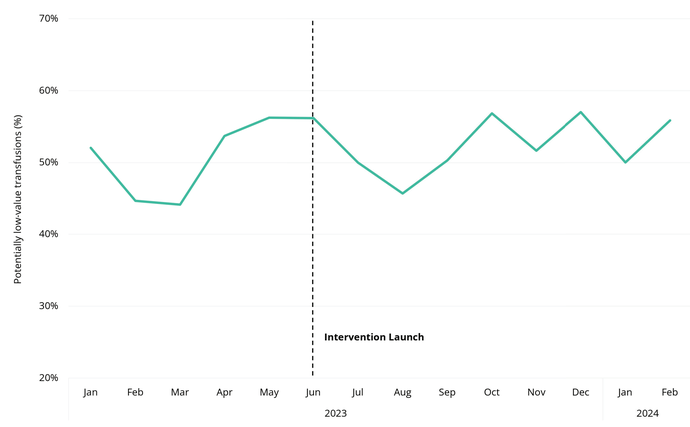
Platelet Transfusions

↓ 28.2%



Fibrinogen Prescriptions

↑ 6.3%



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