

Introduction

About 13 million units of packed red blood cells (pRBC) are transfused yearly in the United States, making pRBC transfusion one of the most common hospital procedures.¹ The Association for the Advancement of Blood & Biotherapies recommends a transfusion threshold of hemoglobin (Hb) 7-8 g/dL; however, these guidelines are not always strictly followed, and transfusion appropriateness continues to be an ongoing concern.²⁻⁴ Inappropriate or unnecessary transfusions can lead to overuse of resources and increased adverse outcomes, including include viral and bacterial infectious complications, hemolytic transfusion reactions, allergic reactions, transfusion-related acute lung injury, circulatory overload, and immunomodulation.⁵ Reducing unnecessary blood transfusions is an effective strategy for improving high-value patient care. During the COVID-19 pandemic and subsequent blood supply shortage, the Dallas County Hospital implemented new pRBC screening protocols to ensure appropriate use.

Design and Methods

Our study aimed to determine whether new pRBC screening protocols in the Dallas County Hospital brought about by the COVID-19 pandemic led to a difference in the number of hemodynamically stable patients receiving 1 vs 2 or more pRBC transfusions pre- vs mid-pandemic for Hb values between 6-7 g/dL. We pulled transfusion records from August to December for pre-pandemic (2019) and mid-pandemic periods (2020 and 2021) and omitted entries not of “routine” priority, not of a Hospital Medicine or teaching ward, and with Hb not between 6-7 g/dL. The data was then sorted by number of units transfused for analysis.

Results

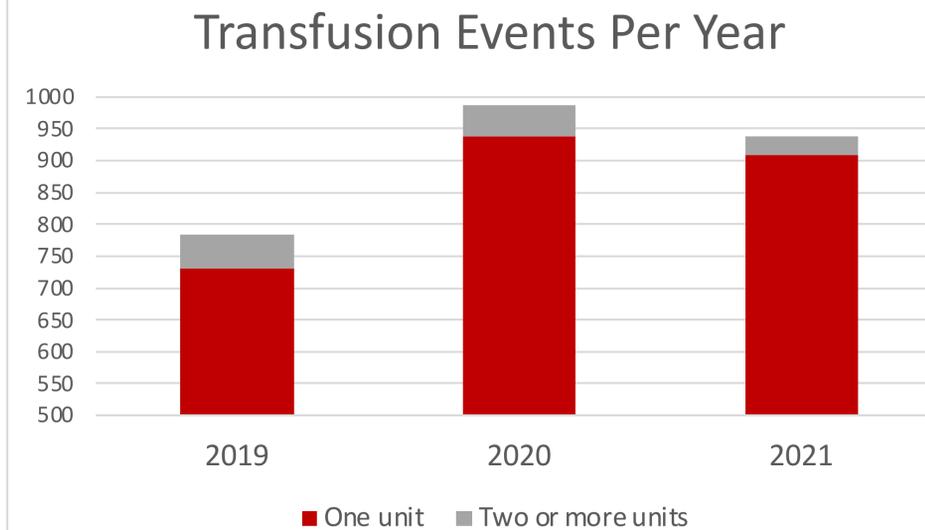


Figure 1: Transfusion events per year involving one (red) vs. two or more (gray) pRBC units.

- 784 pre-pandemic and 1925 mid-pandemic events
- Transfusion events involving 1 pRBC unit:
 - 2019: 730 of 784 events (~93%)
 - 2020: 939 of 986 events (~95%)
 - 2021: 909 of 939 events (~97%)
- Average daily patient census:
 - Pre-pandemic (2019): 340 patients
 - Mid-pandemic (2020-2021): 420 patients
- Considering censuses, there is a statistically significant difference in transfusion practices between pre- and mid-pandemic groups.
- More patients mid-pandemic received a lower number of units when needing a transfusion for a Hb value between 6-7 g/dL [$X^2(1, N = 2709) = 10.1, p = .0015, 95\%$ confidence].

Discussion

The COVID-19 pandemic resulted in higher patient censuses and a blood supply shortage, leading to stricter transfusion guidelines at the Dallas County Hospital that involved screening every pRBC unit for appropriateness. Analysis of these stricter practices suggests these new protocols have led to more efficient and appropriate use of transfusion services, thereby leading to an improvement in high-value care in these hemodynamically stable patients. A continued focus on high-value care and continued close assessment and scrutiny of transfusion appropriateness is needed, especially as we move away from the shortages of the COVID-19 pandemic. Training faculty, house staff, and medical students in transfusion appropriateness and in considering cost-effective, safe alternate therapies like iron infusions is critical to encouraging continued high-value care. In this regard, our hospital now has a Patient Blood Management committee-driven Hospital Wide Campaign of “ONE”: order One unit at a time in stable patients, consider iron, and Eliminate unnecessary pRBC transfusions.

In summary:

- **The challenges brought by the COVID-19 pandemic led to more efficient transfusion practices and improvement in high-value patient care**
- **Continued scrutiny of and focus on transfusion appropriateness is needed**

References

1. Whitaker BI, Rajbhandary S, Harris, A. *The 2013 AABB Blood Collection, Utilization, and Patient Blood Management Survey Report*. Bethesda, MD: AABB; 2015.
2. Carson JL, Guyatt G, et al. Clinical practice guidelines from the AABB: red blood cell transfusion thresholds and storage. *JAMA*. 2016 Nov 15;316(19):2025-2035.
3. American Society of Anesthesiologists Task Force on Blood Component Therapy. Practice guidelines for blood component therapy: a report by the American Society of Anesthesiologists Task Force on Blood Component Therapy. *Anesthesiology*. 1996;84:732-47.
4. Barr PJ, Donnelly M, et al. The appropriateness of red blood cell use and the extent of overtransfusion: right decision? Right amount? *Transfusion*. 2011 Aug;51(8):1684-94.
5. Franchini M, Marano G, et al. Red blood cell transfusion policy: a critical literature review. *Blood Transfus*. 2017 Jul;15(4):307-317.