

REDUCING TIME OF FIRST PRBCs ADMINISTRATION IN HEMORRHAGIC SHOCK PATIENTS

Introduction

Rapid availability of blood products in the trauma bay is key to the adequate resuscitation of patients presenting in hemorrhagic shock. We know that patients with untreated hemorrhagic shock leads to high morbidity and mortality. In our ACS Level II trauma center, blood products were previously obtained from the blood bank during trauma activations. Despite our mass transfusion protocol, we found there was variability in time to administration of PRBCs during resuscitation efforts. A collaborative decision was made to install a blood refrigerator in the trauma bay to assure the immediate availability PRBCs.

Purpose

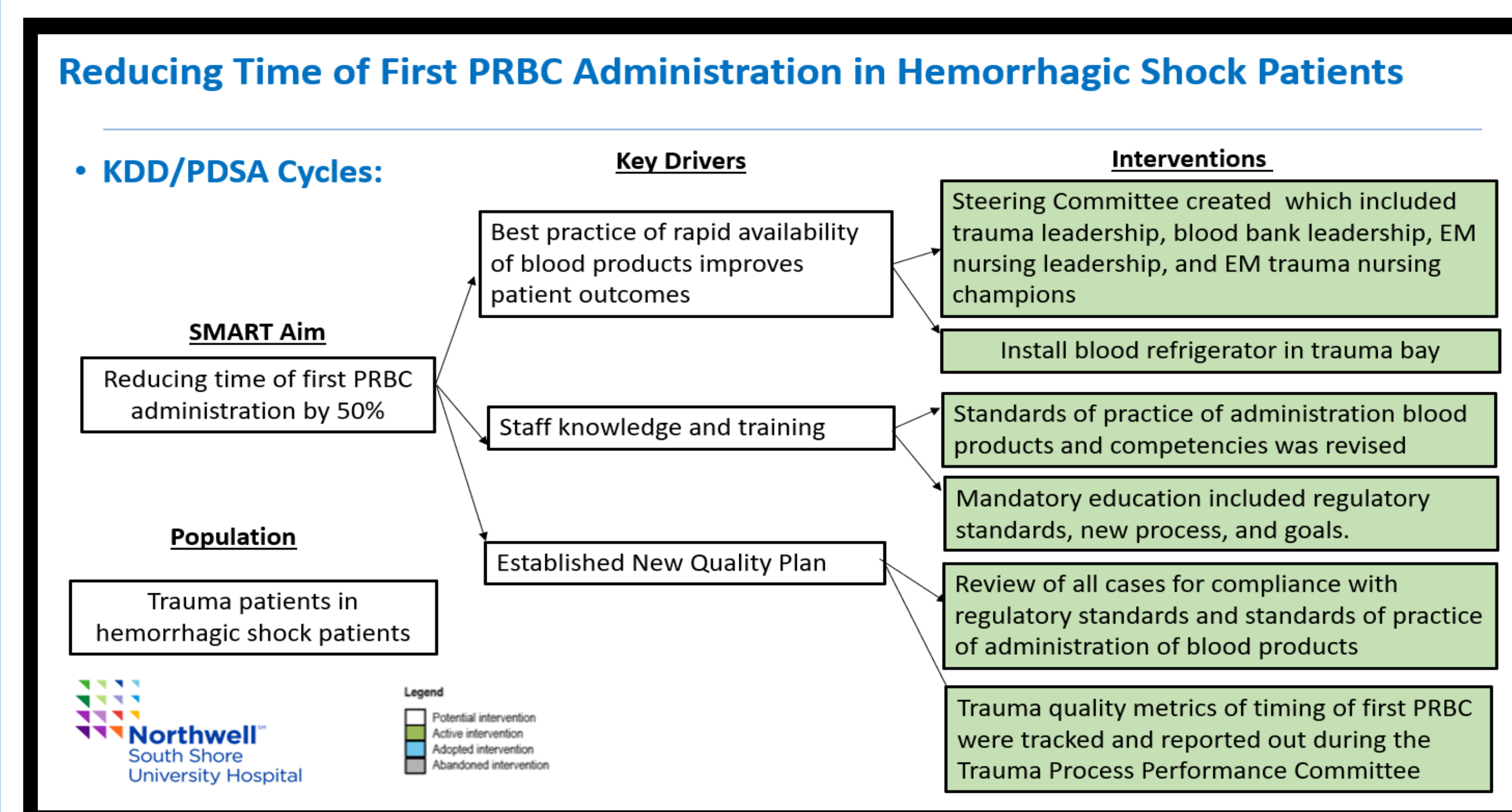
This project was initiated at our trauma center after a drill down of patients meeting TQIP hemorrhagic shock criteria showed a prolonged time to administration to first PRBCs. These case reviews demonstrated that the average time of the first PRBCs administered in the trauma bay was 17.7 minutes. Well established guidelines indicate rapid availability of blood products leads to improved patient outcomes. To improve the timeliness of the first PRBCs administration for patients in hemorrhagic shock at our institution, we determined that storing 2 units of universal donor PRBCs products in a blood refrigerator located in our trauma resuscitation bay would be helpful.

Methods

A dedicated blood refrigerator was installed in the trauma bay to ensure rapid availability of blood products to trauma patients in hemorrhagic shock (Figure 1).

- The trauma team organized a multidisciplinary committee which included trauma leadership, blood bank leadership, EM nursing leadership and EM nursing trauma champions.
- The committee created a quality plan which included regulatory standards for monitoring usage and storage of blood products and monitoring the new process for administration of blood products
- Mandatory education was provided to blood bank team members and EM nursing team members.
- Quality case reviews were conducted concurrently for compliance and adequate documentation.

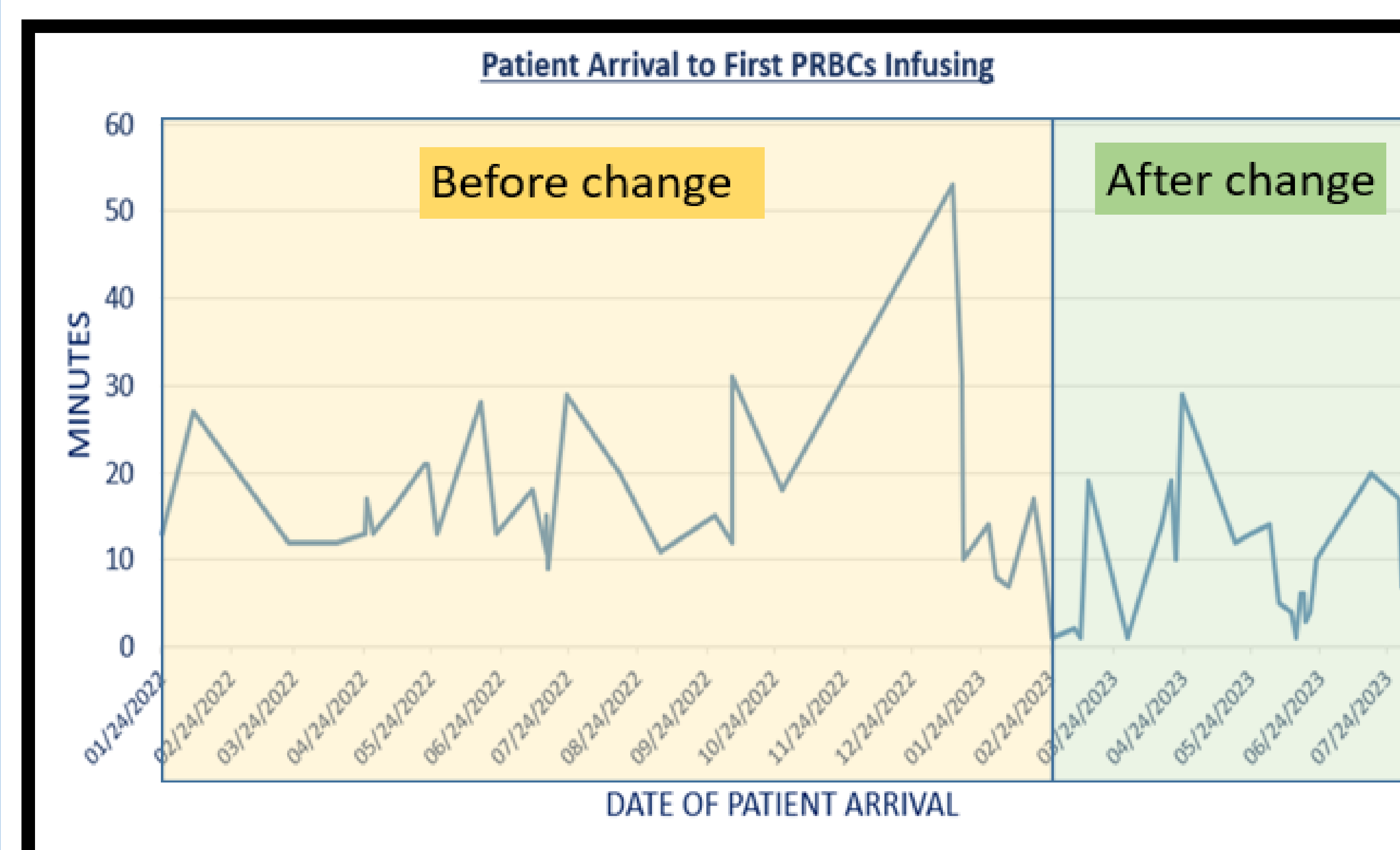
Key Driver Diagram – Figure One



Results

We compared data from January 2022 through February 2023 (before change in process), to February 2023 through July 2023 (after change in process). Charts were audited for time of patient's arrival to time to first PRBC administration. After implementation of our new process, the average time for the first PRBCs administration improved from (mean ± standard deviation) 17.7 ±9.1 minutes to 9.6 ±7.1 minutes (a difference of 8.1 minutes, p<.001) which is a reduction of 49%.

Time of Arrival to PRBC Infusing – Figure Two



Discussion

During the project we encountered pre-implementation and post implementation challenges.

Pre-Implementation Challenges:

- The blood bank leadership had changed resulting in a new standard of practice to be developed.
- Monitoring of the regulatory standards consisted of daily temperature logging, developing a secured locking device, and installing an alarm.
- The tasks were completed over the next 12 months.

Post-Implementation Challenges:

- Documentation of time of request and time to first administration of first PRBC was varied or missing.
- Documented delays for administration of blood products were noted due to equipment issues.

As we continue to evaluate our PDSA cycle, we will continue to overcome implementation challenges. Data is shared during our monthly quality meetings to highlight the improvement of reducing time for the first PRBC administration.

Conclusion

Our project of installing a blood refrigerator in the trauma bay continues to decrease the time of administration of first PRBC in patients meeting the criteria for hemorrhagic shock. Currently we are approaching our target goal of reducing administration time of first PRBC's by 50%. We will continue to track and trend all metrics for a revised target goal to reduce the timeliness of first PRBC to best practice of 5 minutes. With the reduction of time to administration we will continue to measure patient outcomes.

References

Committee on Trauma, American College of Surgeons. Resources for Optimal Care of the Injured. Chicago, IL: American College of Surgeons; 2022.
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