

Operation Save: Reducing Blood Product Waste in the Operating Room

Nurse Anesthesia Residents: Jena Conway, BSN, RN, CCRN-CMC, Danielle Donovan, MSN, RN, Alexandra Hogg, BSN, RN, CCRN
DNP Project Chair: Dr. Jennifer McPherson, DNP, CRNA, CHSE
Team Members: Barbara Acord, PhDc, MSN, CRNA, & Christina Wheeler, DNAP, CRNA



Relevance of Blood Product Waste in the Operating Room



Importance of Blood Product Stewardship

- Health systems generate \$910 billion dollars of waste annually, with blood products accounting for \$230 million dollars (Hannon, 2015., & Collins et al., 2015)
- Financial and ethical considerations
- Critical to have all types of blood products available at a Level I Trauma Center
- National guidelines aim for health care facilities to have below 1% preventable waste (Collins et al., 2015)



Organizational Need for Improvement

- 1.21% blood products wasted in operating room in 2022 (UVA Health, 2022)
- Stewardship is an important aspect of the project site's values (Rector and Visitors of the University of Virginia, n.d.).



Problem Statement & Overall Project Purpose

- **Problem**

- Blood products are a valuable, scarce, and critical resource, emphasizing the need for responsible handling to decrease the incidence of its waste

- **Purpose**

- Assess blood product waste trends at the project site
- Identify a root cause of blood product waste within the perioperative environment
- Analyze current blood product administration policies & previously conducted projects
- Provide staff education on improved blood product handling

Significance & Impact of Blood Product Waste

- The Institute for Healthcare Improvement (IHI) aims to prioritize the minimization of costly and valuable resource waste (Macfie & Leo, 2019)
- Project site annual blood product wastage is above national guidelines
- Ethical responsibility to those who have selflessly donated blood
- Blood products are often in a shortage of supply and there are external factors that create shortage that are outside of the control of the medical center

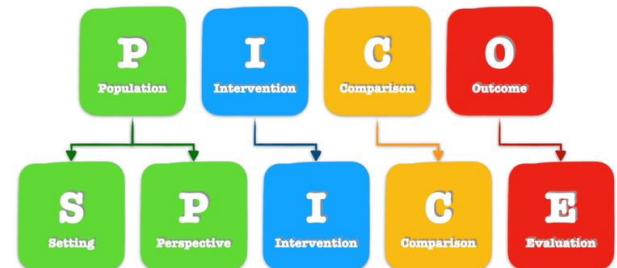


Evidence Synthesis

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Research Questions

- In healthcare settings (S), for healthcare providers (P), how does the implementation of a blood product waste reduction initiative (I) compared to no initiative (C) affect monthly blood product wastage (E)?
- In academic medical center operating rooms (P) how does implementation of blood product education (I) compared to not providing education (C) affect blood product wastage rates (O)?



Appraisal Process & Body of Evidence Grade

- Computerized searches of databases using Grafton Library were performed through February 18, 2024 and March 2, 2024
- 19 articles in total were appraised
- Appraisal tools utilized include:
 - Joanna Briggs Institute (JBI), JBI Appraisal Checklist for Analytical Cross-Sectional Studies, and Standards for Quality Improvement Reporting Excellence (SQUIRE) 2.0 (JBI, 2020; Ogrinc et al., 2016)
- Sources were graded according to Dietary Guidelines Advisory Committee (DGAC) strength of evidence chart
- After this comprehensive literature review, the evidence was found to be limited in quality as the studies were a mix of *moderate to weak* in design per the Polit & Beck evidence hierarchy (Polit & Beck, 2019)

Literature Synthesis & Recommendations

- Seven articles (Badawi et al., 2023; Burk et al., 2021; Collins et al., 2015; Lou et al. 2023, Marik., 2014, McGann & Weyand., 2022,, & Yazer et al. 2016) utilized a multiple-initiative approach, including educational interventions, intending to decrease blood product waste
 - Despite limitations, the findings support the addition of a blood product waste initiative as an effective way to decrease blood product wastage
- Based on the evidence synthesis, we suggest that healthcare settings implement a blood product waste initiative to decrease blood product waste within their healthcare system (JBI recommendation Grade B; JBI, 2020).

Methods

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Project Aims

Blood Product Waste Data Retrieval & Analysis

- **Project Aim #1**

- Review the monthly blood product waste trends from January 2023 to December 2023

- **Project Aim #2**

- Create a Cause-and-Effect diagram to aid in identifying the various causes of the practice problem

Project Aims

Current Policy & Previous Project Evaluation

- **Project Aim #3**

- Identify and survey anesthesia staff that utilize blood products to;
 - Assess knowledge regarding current blood product handling policy and protocols

- **Project Aim #4**

- Identify and survey anesthesia staff that have knowledge of previously conducted project(s) at the facility;
 - Define and understand past projects
 - Assess and identify any shortcomings, successes, future recommendations

Project Aims

Education Intervention Implementation

- **Project Aim #5**

- Design an educational session for anesthesia staff regarding blood product management policy and improved utilization of the policy

- **Project Aim #6**

- Deliver the education that is designed and assess for feedback of usefulness and effectiveness following delivery of education

Project Setting & Population

Sampling occurred in the following groups at the healthcare facility

- **Setting** - Operating rooms within a level I trauma, academic medical center
- **Anesthesia providers**
 - Physician Anesthesiologists
 - Certified Registered Nurse Anesthetists (CRNAs)
 - Nurse Anesthesia Residents
- **Non-anesthesia providers**
 - Surgeons/Proceduralists
 - Nurses
 - Blood Bank Personnel

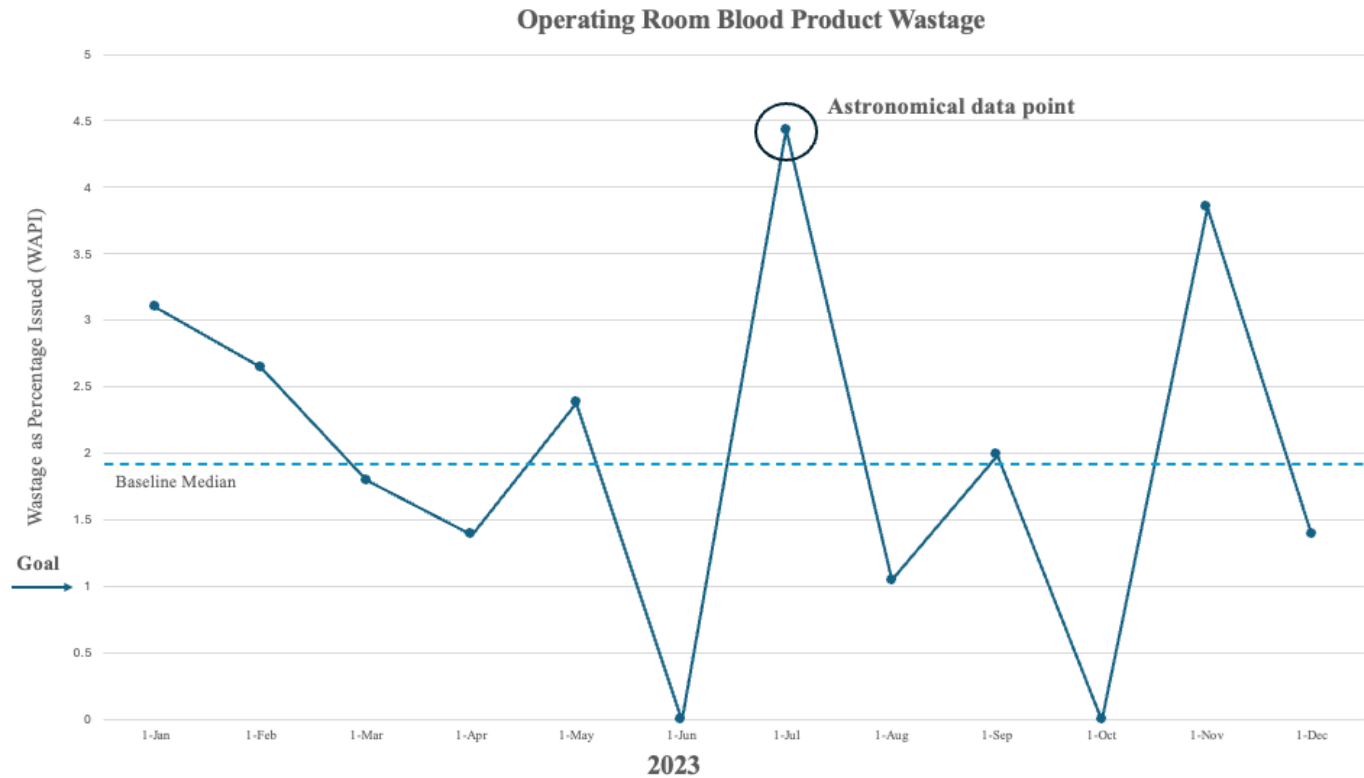
Ethical Considerations

- Data was retrieved from a de-identified database that described when a blood product was wasted and the reason for the waste
- There was not a need for informed consent as no human subjects were used for the blood product waste data collection
- Surveys collected contained no identifying data of the participant
- Participants for the educational component were on a voluntary basis

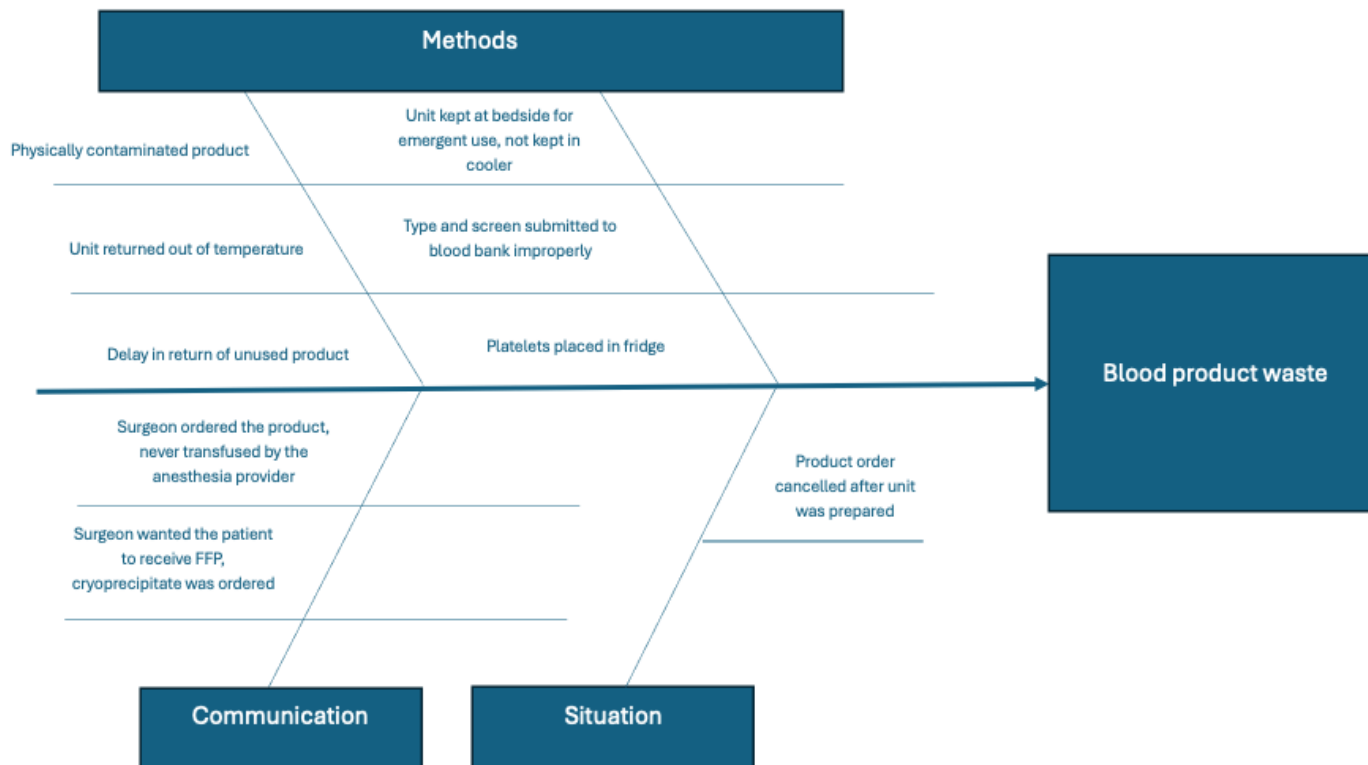
Results

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Blood Waste Analysis Results



Blood Waste Analysis Results



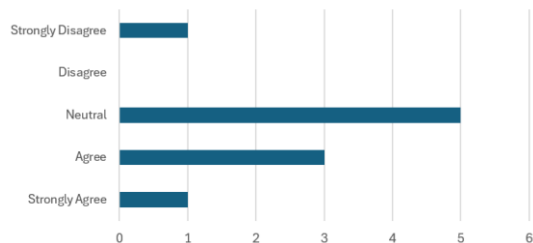
Pre Survey Results

- The educational session, which included a survey for participants, was delivered to a staff meeting of nurse anesthetists.
 - Facility site employs 65 nurse anesthetists
 - 26 nurse anesthetists attended the meeting
 - 10 staff members completed the pre and post survey
 - Pre survey results suggest that the facility has blood product protocol but that it is not being effectively used in clinical practice.

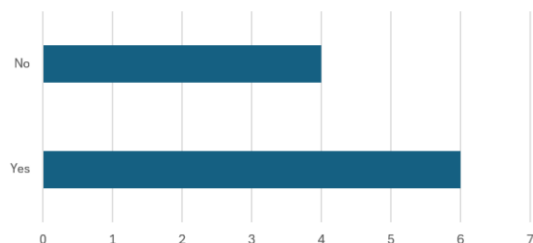
Pre Survey Results



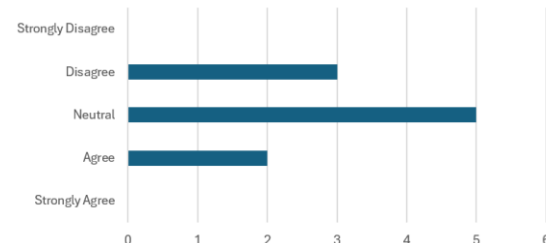
Q1: Familiarity with blood product handling and administration policy at this facility.



Q2: Familiarity where blood product protocols are documented?

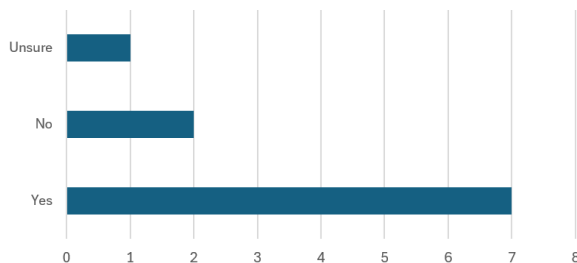


Q3: Sufficient training upon hire regarding blood products.



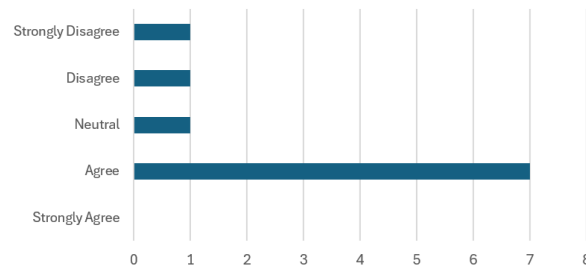
Unsure Regarding Policy Points

Q4: Does facility provide blood product retraining periodically?



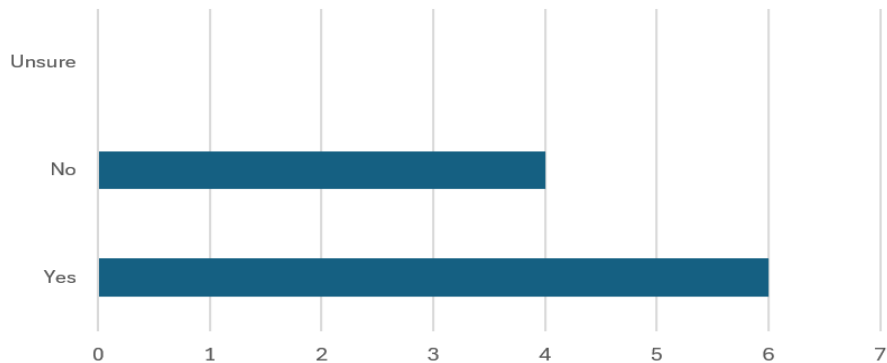
Aware of Where to Find Policy

Q5: Need for improvement of blood product training?

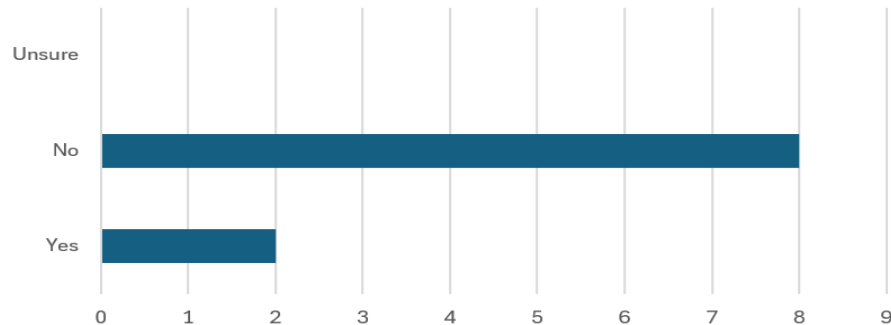


Pre Survey Results

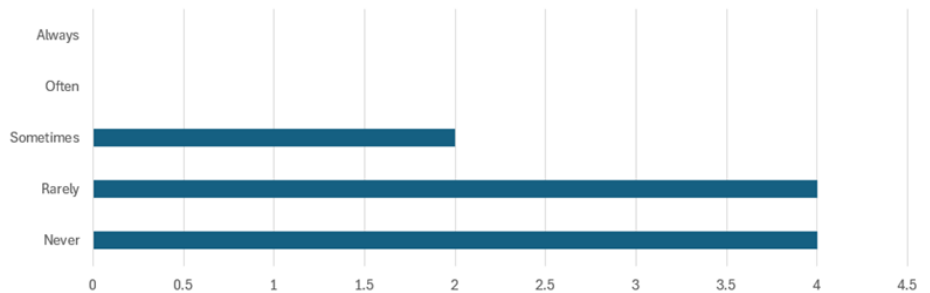
Q8: Aware of blood "time-out" procedure?



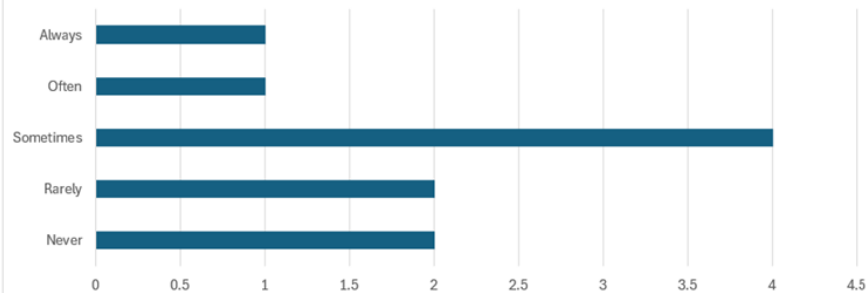
Q9: Is blood discussed before leaving the operating room?



Q10: How often is a post-procedure time-out actually conducted?



Q11: How often is blood discussed at final procedure time-out?



Post Survey Results

- Results for the post survey reached complete saturation
 - 100% reported “yes” for all post-survey questions demonstrating;
 - increased confidence regarding minimizing blood product waste
 - usefulness of the education session
 - improved awareness of overall handling of blood products following educational session

Post-Survey Question Responses

Q1: I feel more confident in my ability to minimize blood product waste.		
Yes		10
No		0
Q2: This education session helped me understand the importance of minimizing blood product waste.		
Yes		10
No		0
Q3: I have better awareness of the intraoperative workflow and process for retrieving, handling and returning blood products following this education.		
Yes		10
No		0

Discussion

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Interpretation

- Interpretation of the blood waste data showed random variation in the data points
- The astronomical data point could be attributed to factors such as trauma season or an increase in new learners during this time period
- Education session presented to anesthesia providers in June 2023 had inconclusive impact on wastage rates
- The Cause-and-Effect diagram identified that the *Methods* surrounding blood products handling should be a focus on area for improvement

Interpretation

- The survey results demonstrate a few common themes amongst staff regarding current blood product policy;
 - An uncertainty amongst staff regarding what the policy is for handling blood products
 - A need for improvement in staff training on blood product protocols
 - Lack of clear communication around blood product handling/administration in the OR
- Respondents endorsed support for future projects related to minimization of blood product waste

Implications

- Successful interprofessional collaboration and team building on project issue
- Utilized root cause analysis framework to identify common causes for blood product waste
- Potential applicability for other projects focusing on resource waste conservation (ie. IV fluids)
- The findings from this project have positive implications for the facility and future nurse anesthesiology practice
 - Facility site can expand upon project findings to improve blood product handling
 - Established the need for continuous education on blood product management
 - Potential for expansion of project for future DNP projects- e.g. creating specific intervention based on project findings

Limitations

- Blood waste data analysis was done retrospectively and did not look at the impact of our projects educational intervention
- Unable to obtain other local health systems O.R. waste data to compare WAPI for benchmarking
- Convenience sampling, by definition, limits the number of respondents who are available
- The original meeting session scheduled for education and surveys required rescheduling, and attendance was suboptimal due to scheduling and staff availability.
 - The session conducted took place during a staff meeting for nurse anesthetists; other key stakeholders were not included in this meeting

Conclusions & Future Recommendations

- In order for facilities to minimize blood product waste it is beneficial for staff to be continuously up to date on training, education, and current facility policies
 - Consistent with literature reviews
- Clear communication amongst team members helps to ensure judicious use of blood products and minimize waste
 - Audit current practice at the project site when blood products are being handled
- Blood product waste initiatives are a useful tool in helping facilities to become cognizant of their blood product wastage rates and minimizing waste
 - Continue to have support from leadership

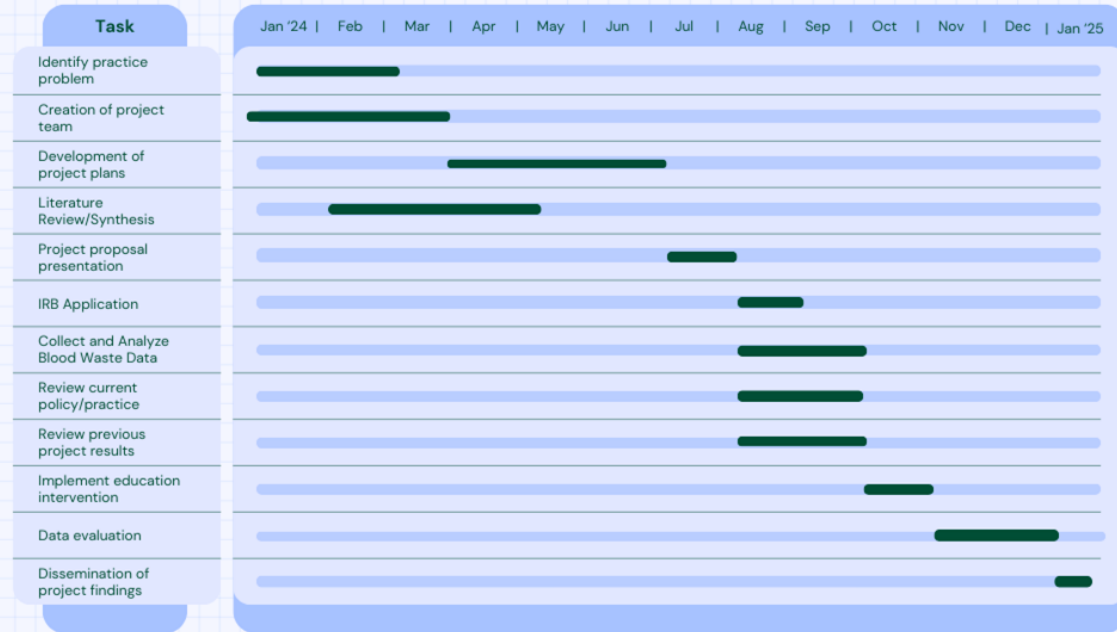


Resources, Costs, & Other Needs

- Minimal costs
- Direct costs included the time required from the project team as well as the participants
- Indirect costs included the use of technology software utilized to track blood product data trends through the blood bank
- Project utilized Google Sheets, Google Slides, Google Forms, and Microsoft Excel to gather, organize, and analyze data

Project Timeline

Blood Product Waste Reduction QI Project Timeline



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References



Questions?

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