Implementing a Phlebotomy Training Program to Decrease Troponin Hemolysis Rates in an Emergency Department

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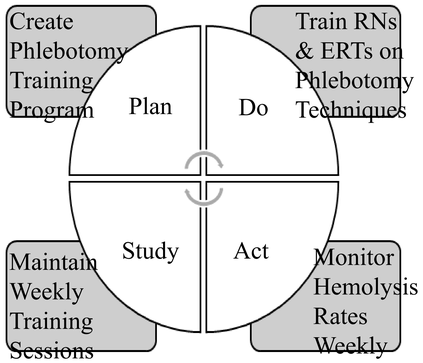
Introduction or Purpose

- The literature indicates that EDs experience a higher rate of hemolyzed blood specimens compared to other units (Ersoy et al.,2023).
- Historically, troponin hemolysis rates at the project site range from 7% to 9%. Hemolyzed troponin samples may result in a lower troponin level leading to a false negative result.
- Blood specimen hemolysis has a negative impact on the healthcare system by increasing patient length of stay, cause unnecessary patient discomfort with repeat venipuncture, utilizes more resources including collector time to repeat blood specimen collection which may increase healthcare costs (Ersoy et al., 2023).
- This project aims to evaluate the hemolysis rate of troponin samples collected by registered nurses (RNs) and Emergency Room Technicians (ERTs) working in the ED after completion of a phlebotomy training program on best practices in blood specimen collection.

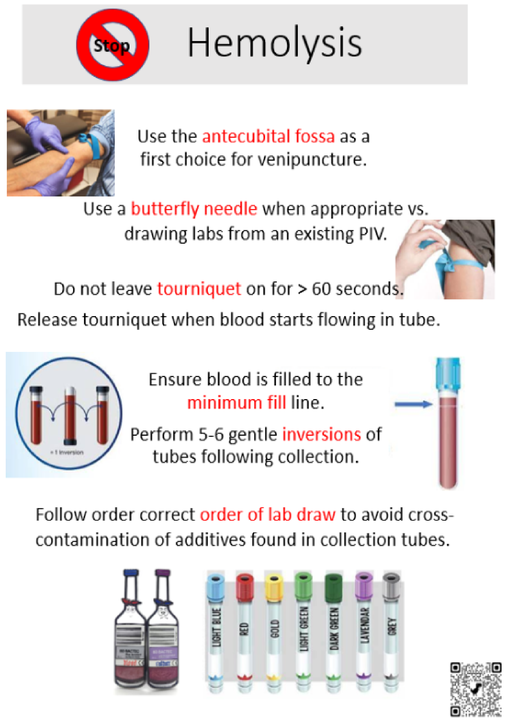
Design Setting

- A protocol was submitted to the Columbia University IRB and was granted exemption.
- A QI design model was used to implement the project and measure outcomes including pre- and post-implementation hemolysis rates for both collector types (RN and ERT) to determine if there was a significant decline in hemolysis rates compared to before the intervention.
- Data was collected for a period of 12 weeks. The target population of this project was over 200 RNs and ERT staff.



Materials/Methods

- Staff education was provided weekly in the form of a read and sign poster that described the best practices in phlebotomy as well as hands-on phlebotomy training sessions.
- ERTs completed a competency checklist with validation by direct observation of techniques to ensure compliance with newly taught phlebotomy skills.

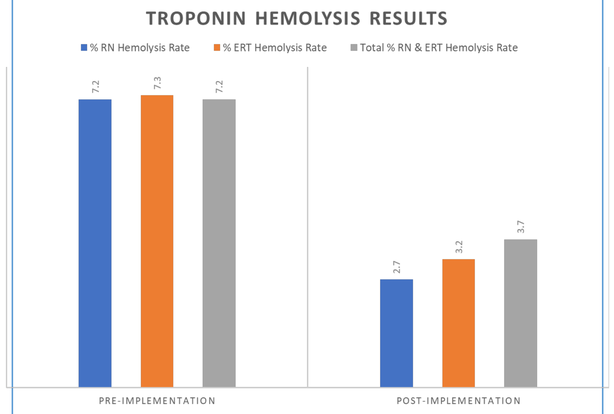


Demographic Data

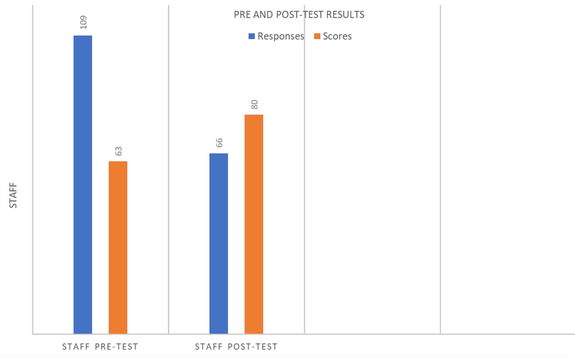
TOTAL	155								
RN	RN	ERT	NA						
ERT	76	77	2						
Percent	49	49	2						
Gender Identity	Male	Female	NA						
	24	129	2						
Percent	15	83	1.2						
Sex assigned at Birth	Male	Female	NA						
	25	129	1						
Highest Degree	Some high school	High school	Trade School	Some College	Associates	Bachelors	Masters	Doctoral	NA
Total	2	18	9	28	14	78	5	1	1
Years of Experience	0-1 years	1-3 years	3-5 years	5-7 years	7-10 years	>10 years			
Total	5	23	18	12	30	67			
Work Status	full time		Per Diem	NA					
Total	153		1	1					
Age	18-25		25-35	35-45	45-55	55-65	66 yrs old or <		
	4		47	38	35	30	1		
Ethnicity	American		Asian	Black or AA	Hispanic	Mixed race	West Indian American	White Non-Hispanic	NA
	1		38	61	35	1	1	14	4

Results

- Hemolyzed troponin samples decreased from 7.2% to 3.7%.
- ERT troponin hemolysis rates prior to project start declined by 56% (7.3% vs 3.2%).
- Of samples collected by RNs, there was a 62% reduction in hemolyzed troponin samples (7.2% versus 2.7%).



- Results from the pre- and post-implementation survey revealed learners had gained knowledge on the best practices in phlebotomy taught during the in-service (63% average score on pre-test versus 80% average score on post-test).
- Staff understood the causes of blood specimen hemolysis and gained knowledge on the importance of using the antecubital fossa as first choice for venipuncture, tourniquet application of less than 60 seconds, and using a larger bore needle for blood drawing including the use of a butterfly needle as first choice when possible.



Implications/ Conclusions

- Decreasing troponin hemolysis rates may lead to a shorter patient length of stay, potential for less patient discomfort, more timely diagnosis and treatment of cardiac conditions, and overall improved patient satisfaction.
- Future recommendations include targeted interventions to improve workflow in the ED by installing designated phlebotomy stations throughout the department where ERTs can collect subsequent blood samples following initial PIV insertion by RNs.
- Additionally, a training program focused on techniques of blood specimen collection in addition to a remediation session for those that have higher hemolysis rates, may promote a culture of change to encourage the use of best practices in phlebotomy.
- ERTs contributing to low incidence of hemolyzed samples support the possibility of utilizing them more frequently for the use of blood specimen collection in the ED.

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