

Risky Business: Venous Thromboembolism Risk Screening in Pediatric Critical Care

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Introduction

Pediatric patients were previously thought to be at low risk for developing venous thromboembolisms (VTE). More current evidence suggest that hospitalized children are 100 to 1,000 times more likely to develop a VTE than well children. VTEs are a major predictor of mortality within hospitalized children and children in the ICU are high risk due to multiple factors such as central lines, immobility, and trauma.

Topic

- Screening critically ill children for venous thromboembolism risk and ordering appropriate prophylaxis based on risk assessment.

Problem

- PICU patients are at increased risk for VTEs based on multiple risk factors.

Current practice: no agreed upon standard for VTE prophylaxis, provider-specific, not based on risk factors, age, or current recommendations

Team

- Kristina Betters MD – QI Champion and ICU Intensivist
- Stacey Schlafly MPH – Quality Consultant

Aim

- To increase VTE prophylaxis screening utilization from 0% within 48 hours of admission (January 2022 – August 2022) to 50% within 48 hours of admission by December 2022 in the PICU at Vanderbilt

Methods

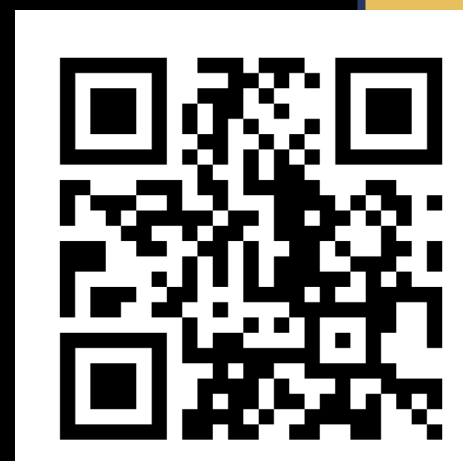
Utilized the Plan Do Study Act (PDSA) quality improvement model to implement a screening protocol for children admitted to the Pediatric Critical Care Unit (PCCU). Created functionality in EMR to document risk factor screening and integrate protocol into ordering of VTE prophylaxis.

PDSA Methodology

- Plan
 - Identify current practices and areas for improvement
 - Create a team for protocol creation and implementation
 - Create functionality in EMR for risk documentation
- Do
 - Implement the new protocol
 - Monitor the implementation
- Study
 - Analyze the data collected
 - Describe and report the findings
- Act
 - Decide on future of protocol based on data and outcomes
 - Review challenges in implementation and scoring
 - Repeat PDSA cycle

Measures

- Number of children in the PICU eligible for screening
- Risk of VTE based on protocol scoring
- VTE contraindications
- Type of VTE prophylaxis ordered



PCCU VTE Protocol

Screening Frequency and Correct VTE Prophylaxis Ordering

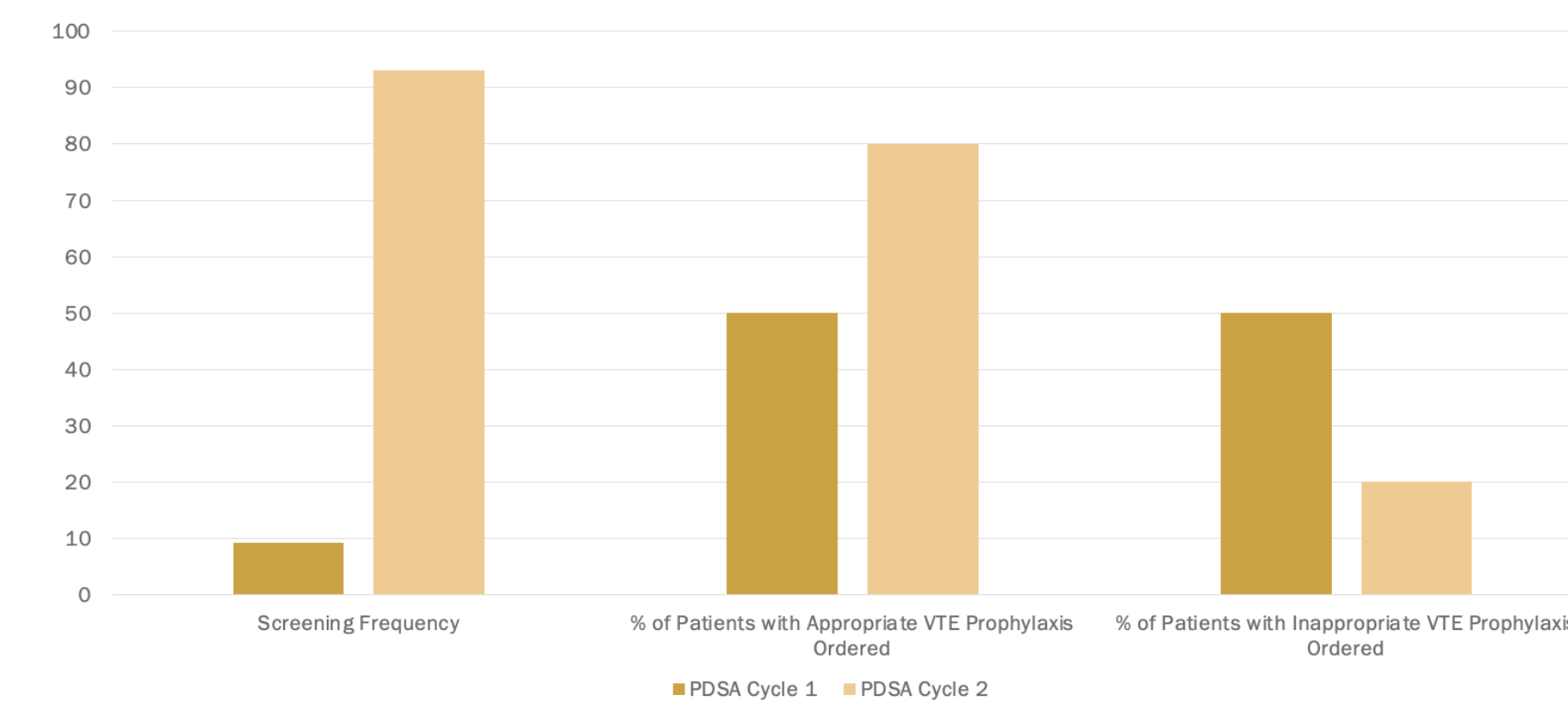


Figure 1: Screening Frequency and Correct VTE Prophylaxis for PDSA Cycle 1 and PDSA Cycle 2

Screening Frequency

	Pre-Implementation	PDSA Cycle 1 (n=14)	PDSA Cycle 2 (n=10)
Screening Frequency % (% of admissions and transfers to the ICU screened prior to 48 hours of stay)	0%	9.23%	93%
% of Patients with Appropriate VTE Prophylaxis Ordered	-	50% (n=7)	80% (n=8)
% of Patients with Inappropriate or No VTE Prophylaxis Ordered	-	50% (n = 7)	20% (n=2)

Figure 3: Screening Frequency Table

VTE Risk Assessment

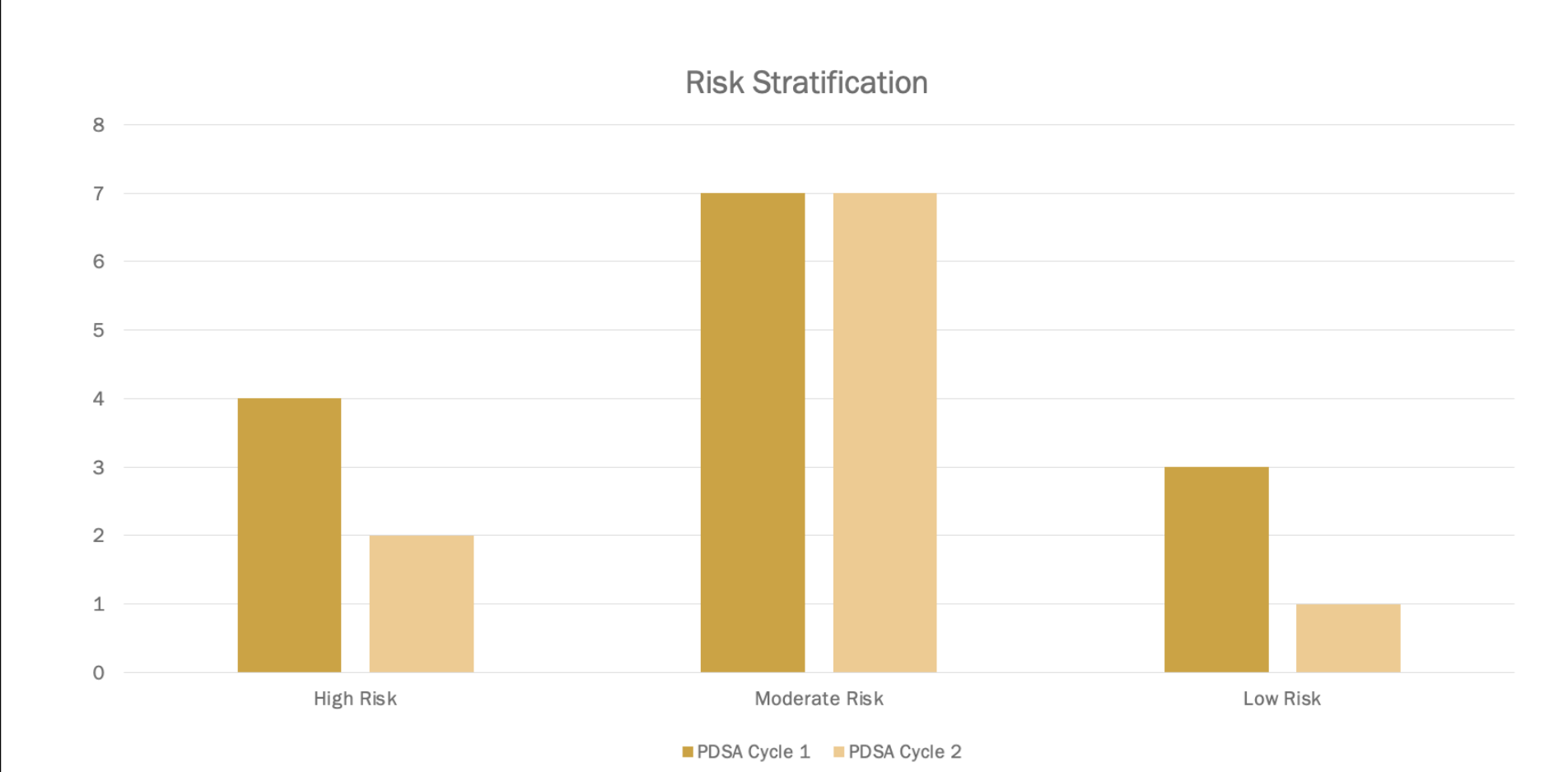


Figure 4: VTE Risk Assessment Stratification PDSA Cycle 1 and PDSA Cycle 2

Results

Overall screening frequency of children > 13 years old admitted to the PCCU for > 48 hours increased from 0% prior to the implementation of the risk assessment protocol to 93% after PDSA Cycle 2. Appropriate VTE prophylaxis based on risk assessment increased from 50% in PDSA Cycle 1 with appropriate prophylaxis to 80% in PDSA Cycle 2 with appropriate prophylaxis.

Screening Frequency & Risk Assessment

- Prior to implementation of the risk assessment protocol, patients in the PCCU were not being screened for VTE risk and there was no standardization of VTE prophylaxis ordering
- After PDSA cycle 1, only 9.23% of children > 13 yo admitted to the PCCU were screened within 48 hours of admission.
- Prior to PDSA cycle 2, nurse practitioners were re-educated on the protocol and the EMR charting and documentation of the risk assessment.
- After re-education and clarification, 93% of children > 13 yo admitted to the PCCU were screened for VTE risk within 48 hours of admission.

Appropriate VTE Prophylaxis

- During PDSA cycle 1, 50% of patients had appropriate prophylaxis ordered and 50% had inappropriate prophylaxis ordered
- After PDSA cycle 2, 80% of patients had appropriate prophylaxis ordered and only 20% of patients had inappropriate prophylaxis ordered

Implications for Practice

Overall, met aim of increasing VTE risk screening from 0% to > 50% within the designated time frame. 93% of eligible patients screened during PDSA cycle 2.

Strengths:

- EMR integration allowed for easy documentation of VTE risk and contraindications.
- Visual cues on EMR prompted assessment and reassessment of VTE risk.

Weaknesses:

- Frequent reassessment viewed as an extra burden on providers.
- Subspecialty preference prevented some patients from receiving appropriate prophylaxis based on protocol.
- EMR limitations, unable to identify patients already on anticoagulation.

Next steps

- Integration of risk assessment and protocol into PCCU daily safety rounding.
- Long-term assessment of appropriate VTE ordering practices.
- Data collection on VTE frequency post-protocol implementation.

Scan for References

