Reducing Clinical Variation & Cost via a Patient Safety Organization Approach

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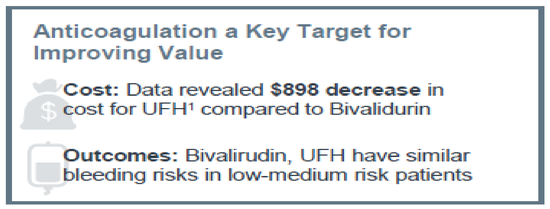
Carolinas HealthCare System
Sanger Heart & Vascular Institute

Delivering world-class heart care for the full range of heart and vascular conditions for over 50 years.

Project Selection

In 2014, the Sanger Heart & Vascular Institute (SHVI) Clinical Optimization Team identified an opportunity for cost saving in anticoagulation treatment for Percutaneous Coronary Intervention (PCI). Such treatment is used to limit thrombus formation during and immediately post PCI. As anticoagulants, Bivalirudin and unfractionated heparin (UFH) have similar bleeding risk in low and medium risk patients. (Bivalirudin is associated with reducing the likelihood of bleeding events only in high-risk patients.) As UFH does not increase bleeding risk in low or medium risk patients, the use of UFH rather than Bivalirudin in this cohort should significantly reduce the cost of care without compromising clinical outcomes.



To improve patient safety and better standardize care, physicians and administrative leaders must be able to discuss cases and share learnings without fear of repercussion. A Patient Safety Organization (PSO) is a formal structure that can promote such an environment. By specifically organizing monthly Interventionalist Cardiology meetings within a PSO framework, the team was able to recognize and openly address variances in treatment at CHS PCI Facilities (CMC, PNV, and NE). One such variance was in the use of Bivalirudin versus UFH in PCI. The aim of this project was to effect a specific change: maintain PCI quality yet reduce the associated cost of PCI anticoagulation.

https://www.pso.ahrq.gov/about/org

Goal

Reduce the use of Bivalirudin and increase the use of UFH in the low and medium risk PCI patient population without negatively affecting clinical outcomes at Percutaneous Coronary Intervention (PCI) Centers

Key Elements

After reviewing research studies including 'An Updated Bleeding Model to Predict the Risk of Post-Procedure Bleeding Among Patients Undergoing Percutaneous Coronary Intervention" (Fitzgerald et al., 2013) which involved 1,059,474 PCI procedures performed at 1,232 sites. These studies provoked conversations on the risks and benefits of using UFH over Bivalirudin in low and medium risk PCI patients. The studies showed that there were few benefits in using BiValirudin over UFH in patients with a low or medium risk of bleeding.

In the rolling quarter 3 of 2014 76% of PCI patients received Bivalirudin although only 15% of patients fell into the high risk of bleed category based on the National Cardiovascular Data Registry (NCDR) CathPCI Registry bleeding risk score. This showed a potential cost reduction of $898 per treatment in low and medium risk patients approximately $1,187,313 in potential cost savings.

Improvement Process

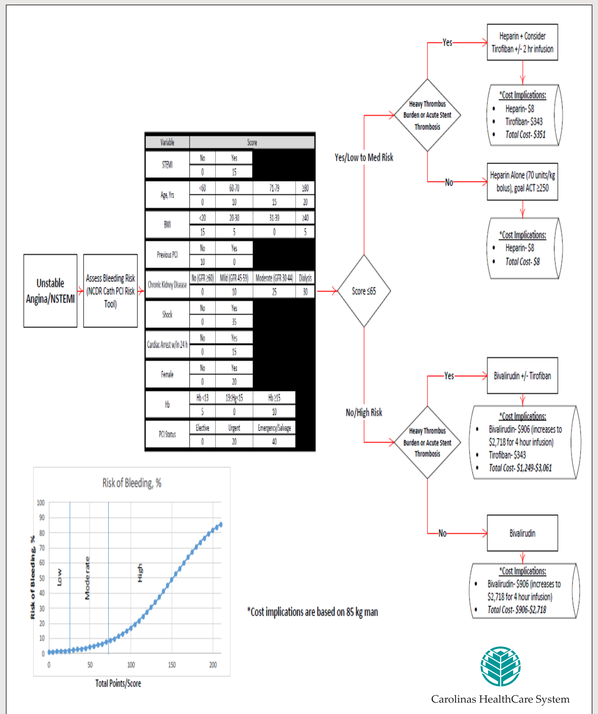
The reducing clinical variation and cost project used the PDSA methodology.

PLAN

Based on the findings, the team developed PCI Anticoagulation Recommendations, which uses the NCDR Bleeding Risk Tool. This tool gives the patient a score based on variables such as age, gender, BMI, history of kidney disease, pre-procedure hemoglobin, etc. if the patient scores 65 or greater, they are considered high risk and should receive Bivalirudin. If the patient scores less than 65, then UFH should be considered as a safe option for anticoagulation therapy.

DO

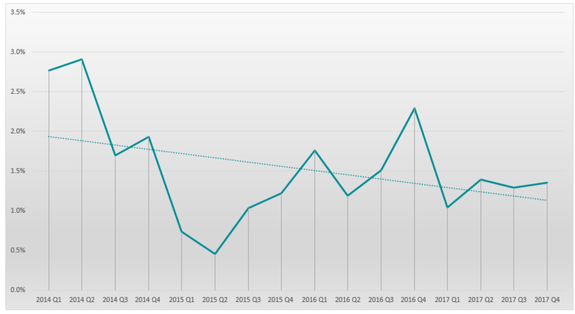
In quarter 1 of 2015, the team began using the PCI recommendations that were developed in the planning phase. Interventional Cardiologist used the PCI Anticoagulation Recommendations that were developed by the team and the PCI patients that fell into low risk for bleed category began receiving UFH.



STUDY

The team held monthly interventional meetings (remote access capable) to discuss cases and data related to anticoagulant strategies in low and medium bleeding risk patients, along with other quality and patient safety metrics. It was determined that the increased use of UFH did not increase the number of bleeding events.

All PCI Centers: % of Bleeding Complications w/ in 72 hours of procedure



Decrease in bleeding rates from 2014 to 2017

2.8% *in Q1 2014*

1.4% *in Q4 2017*

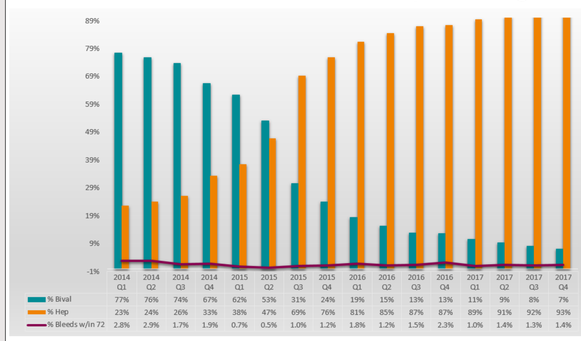
ACT

The team met monthly to review new data and discuss any concerns or barriers encountered. The monthly meeting highlighted the success of using UFH as the first choice for anticoagulation treatment in low and medium risk patients. This encouraged providers to further increase the use of UFH over Bivalirudin.

Results/Outcomes

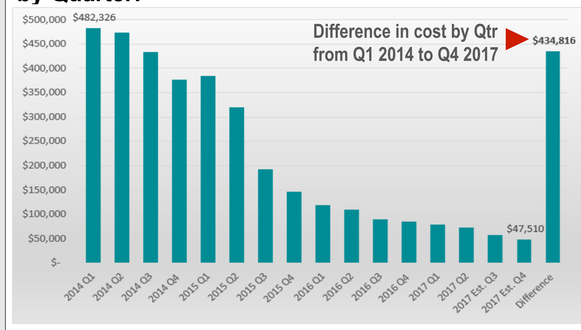
Delivering effectiveness and efficiency by practicing to the highest clinical standards is an integral part of SHVI's mission. The impact of this clinical standard for the Interventional Cardiology program has led to measurable improvements in cost while maintaining top quartile quality outcomes.

All PCI Centers: Bivalirudin vs. Heparin usage:



Reduction in the use of Bivalirudin in the PCI patient population has decreased from 77% in quarter 1 of 2014 to 7% in quarter 2 of 2017.

All PCI Centers: Total Anticoagulation Agent Cost by Quarter:



This equates to an estimated reduction in yearly anticoagulation costs from $1,766,856 to $255,918 with a difference in cost of:

$1,510,938

This outcome was achieved through use of a PSO meeting structure, which fostered open discussion and led to a change in clinical practice that has meaningfully reduced the cost of PCI care without adversely affecting the quality of that care.