

Improving Compliance with Nurse-Managed Unfractionated Heparin Infusion Protocol: A Quality Improvement Project

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Introduction & Background

- Unfractionated Heparin (UFH) is one of the most common anticoagulants (AC) administered in the inpatient setting²⁰
- UFH is a high-risk medication; improper management increases risk of adverse drug events (ADEs) and reduced medication effectiveness²²
- Nurse-driven UFH management protocols have become increasingly utilized and require close monitoring and infusion titration²⁰
- Current literature findings include:
 - Audit and Feedback (A&F):** capable of reviewing quality of care provided in hospitals & confirming the need for improvement¹⁵
 - Plan-Do-Study-Act (PDSA) model:** shown to be useful in making small-scale changes in healthcare²⁴
 - Little research exists on combining A&F and the PDSA model to improve inpatient nurse protocol adherence

Methods

- Design:** QI project with a pre-/post- test intervention design
Setting: 32- bed adult cardiac unit (CU) in an urban academic medical center in the northeast
Intervention: One-group, two-cycle A&F process which was a collaborative approach to the PDSA model. Each PDSA cycle included:
- A chart audit, presentation of results to nurses and discussion of barriers that were reported by nurses via anonymous reporting systems and how to overcome before the next audit
- Measurement & Data Collection:**
- Aim 1:** Retrospective chart audits completed one month pre- and post-intervention, modeled after the current hospital-wide audit system, but more frequent and with unit-specific criteria
 - 11 specific criteria audited per chart; one point given for each met criteria
 - Inclusion criteria: Patient on infusion for at least 24 hours/infusion initiated on CU
 - Aim 2:** Generalized Self-Efficacy (GSE) Scale¹¹
 - 10 items with a four-point Likert-type response scale. Higher score indicates higher self-efficacy
 - Paired results to measure self-efficacy pre-/post- intervention
- Sample:** 52 CU employed registered nurses who perform regular care of patients on UFH infusions

Figure 2: PDSA cycle 1 of 2

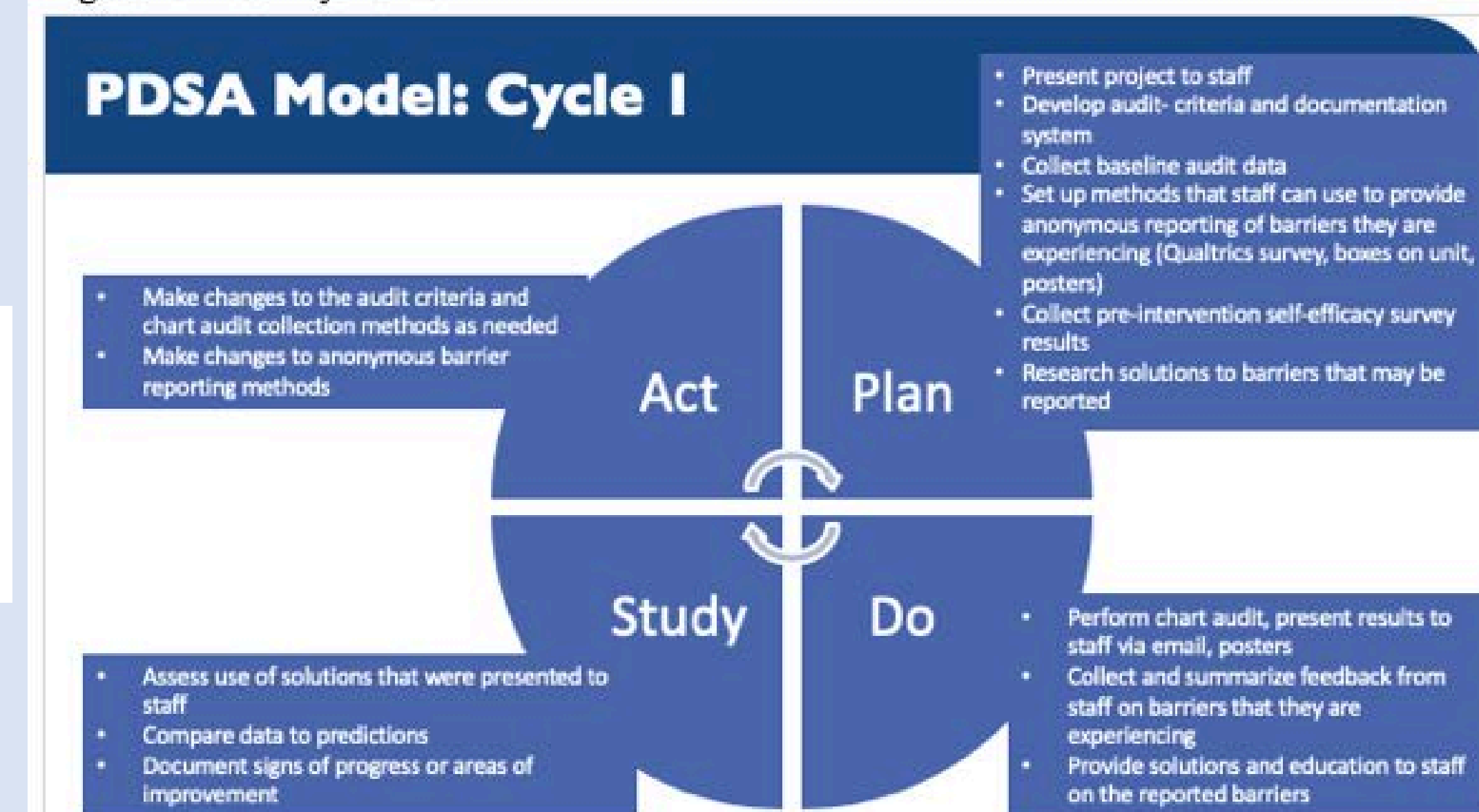
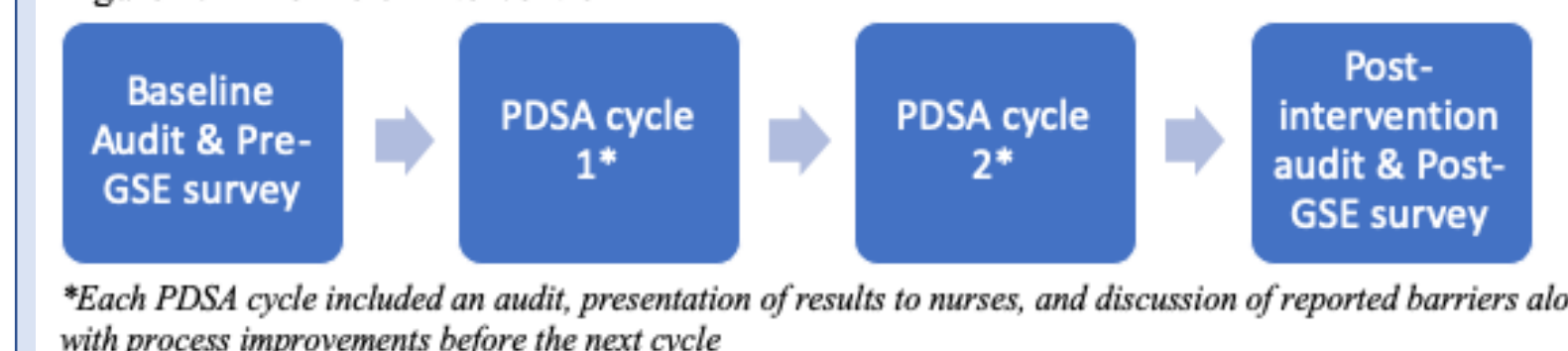


Figure 1: Timeline of intervention



Strengths & Limitations

- Strengths:** (1) Nurse feedback indicated frequent A&F/ two-way communication was helpful and educational; (2) Highlighted areas that could be improved with the current hospital UFH audit system
- Limitations:** low sample sizes, staff turnover, short duration, medication shortages

Results

Aim 1:

- 4 charts were included in the pre-audit and 5 in the post-audit
- Pre-audit:** median score was 6.5 (IQR 2.5); mean score was 7 (SD=1.41). Mean days that patients were on UFH was 3.75 (SD=1.5)
- Post-audit:** median score was 8 (IQR 3); mean score was 7.6 (SD=1.52). Mean days on UFH was 3.2 (SD=1.64)

Group	Chart number	Days on infusion	Days on infusion (mean (SD))	Standardized point score	Adherence over Time*	Standardized score median (IQR)	Raw point score
1	1	3		7/11	1.87	6.5 (2.5)	19/25
	2	2	3.75	9/11			17/19
	3	5	(1.5)	6/11			61/68
2	4	5		6/11	2.38	8 (3)	38/48
	1	5		6/11			47/54
	2	4	3.2	8/11			33/40
	3	4	(1.64)	6/11			33/43
	4	2		9/11			26/28
5	1		9/11	10/12			

Table 1. Comparing Standardized vs. Raw data from pre-intervention group (group 1) vs. post-intervention group (group 2). Standardized data had a total point score of 11 points, one point for each criterion that was fully met. The raw data included one point for each instance that a chart showed compliance with the 11 criteria.

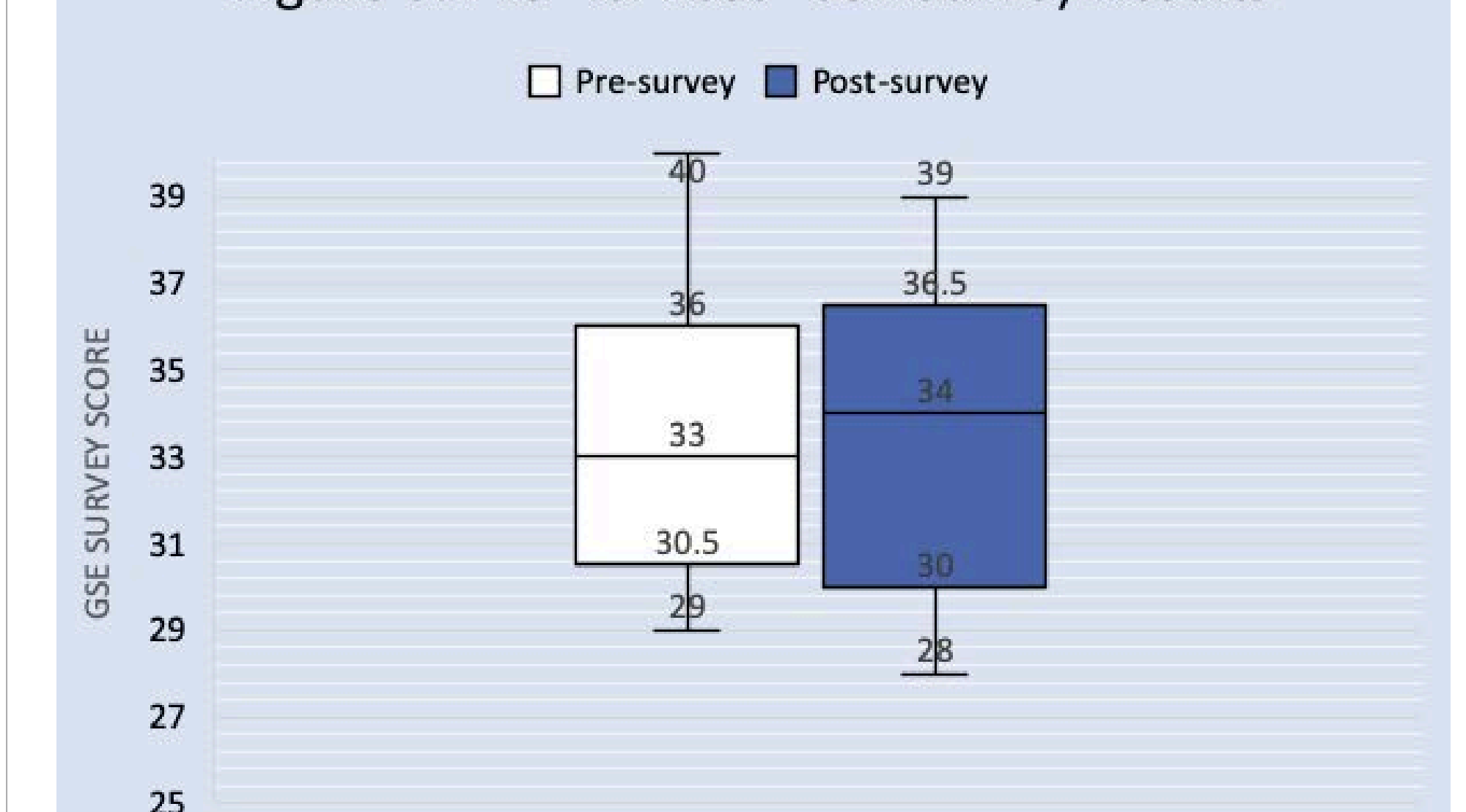
*The adherence over time was calculated by dividing average standardized points by the average days on infusion

- Mann-Whitney U test found that there was **no significant difference** in distributions between pre- and post-audit scores ($p = .602$)

Aim 2:

- A total of 17 participants completed the pre- and post-GSE survey
- Median score on the pretest was 33 (IQR 6) ; Post- test median score was 34 (IQR 7)
- A Wilcoxon Signed Rank test found that the increase in median GSE scale scores was **not statistically significant** ($p = .775$).
- A **clinical improvement** is subjectively noted by participants and preceptors

Figure 3: Pre- vs. Post- GSE Survey Results



Purpose & Aims

Purpose: Implement a two-cycle A&F intervention on the CU with the following aims:

- Aim 1:** Increase nurses' overall UFH protocol compliance measured using pre-/post- chart audits
- Aim 2:** Improve nurses' self-efficacy with managing UFH infusions measured using a pre-/post- survey

Conclusion & Dissemination

- Frequent A&F cycles utilizing a collaborative approach to the PDSA model **does not significantly increase** nurse-managed UFH protocol compliance or nursing self-efficacy on a cardiac unit.
- Clinical significance** is indicated in that nursing staff reported that the two-way communication regarding barriers to compliance to be beneficial
 - Results are disseminated to nursing leaders on the CU & hospital /unit anticoagulation committee members to encourage an extended intervention period with higher sample sizes

References

