



EP21EO – Nurses are involved in the implementing and evaluating national or international patient safety goals.

Provide one example, with supporting evidence, of nurses' involvement in activities that address national or international patient safety goals that led to an improvement in patient safety outcomes. Supporting evidence must be submitted in the form of a graph with a data table that clearly displays the data.

Example: Nurse-Managed Heparin Infusion Initiative

Background/Problem:

A Joint Commission National Patient Safety Goal was established in 2008 to reduce the likelihood of patient harm associated with anticoagulation therapy.¹

- High-risk therapy
- Leading cause of adverse drug events
- Complex dosing, monitoring and compliance
- Multiple agents commonly prescribed concomitantly
- Standardized practice reduces adverse drug reactions with individualized treatment plans for each patient

Additionally, we know that subtherapeutic levels of anticoagulation put patients at risk for thrombus formation and can prolong the length of hospital stays. Supratherapeutic anticoagulation can result in bleeding complications and delay necessary procedures and interventions. Communication delays between the lab and the physician and between the physician and nursing staff performing adjustments account for some of the delays and are potentially avoidable.

Challenges to attaining timely therapeutic anticoagulation in our adult acute care units included:

- Physicians were failing to consistently order PTTs, resulting in lack of follow-up and adjustment of therapy in a timely manner, yielding subtherapeutic levels and / or supratherapeutic levels.
- Epic ordering limitation – A new order was required with every adjustment in the nomogram, necessitating communication between nurse and physician to obtain an order. This was time consuming and contributed to delays in therapy being optimized.

¹ The Joint Commission. (2008) NPSG.03.05.01: Reduce the likelihood of patient harm associated with the use of anticoagulation therapy. *2009 Hospital Accreditation Standards*.



- Communication delays between lab and physician, then nurse and physician contributed to delays in achieving therapeutic range in a timely fashion.
- Monitoring and management of heparin infusions throughout the hospital was inconsistent. Adult ICU heparin infusions were managed by nurses, but acute care units were not.

To meet the National Patient Safety Goal for all patients receiving systemic anticoagulation to be within therapeutic range within 24 hours, UVA Health System has implemented a nurse-managed, adult weight-based heparin nomogram.

A pilot of the nurse-driven heparin infusion nomogram was conducted December 2011-January 2012, involving 50 intervention patients and 100 controls. The pilot was conducted on four acute care units (3C, 3W, 4E and 6W). The rationale for the pilot was shared with nurses and LIPs:

- Successful nurse-driven protocol in the adult ICUs.
- Nurses have increased patient contact.
- Nurses have increased awareness of transitions in care, procedures, etc.
- Nurses provided quicker responses to lab indicators (PTT or anti-Xa).
- Nurses are more cognizant of when labs are being drawn and can identify and address phlebotomy delays.

The results of the pilot demonstrated a time to therapeutic range of 19 hours as compared to the time to therapeutic range of 32 hours with the physician-driven control arm. Based on the success of this study, a new practice was implemented to support the management of all heparin infusions in adult patients by nurses. This approach also provided an opportunity to broaden nurse autonomous practices.

Careful coordination with clinical labs, the phlebotomy team and the pharmacy were required to ensure the pilot plan was successful. In preparation for the pilot, education was provided to the nurses in the pilot units and physicians through live, electronic and computer-based module instructional methods. Tip sheets were provided to nurses to assist in implementation of the pilot, and unit-based clinical pharmacists were available to assist nurses as needed.

The pilot progressed smoothly, and the analysis of the final pilot results revealed the achievement of the goal.

- The pilot population included 50 patients with an average time to therapeutic aPTT of 19:15±15:30.
- The control population of 100 patients had an average time to therapeutic aPTT of 32:32±34:18 ($p < 0.01$).



- Conclusion: A nursing-initiated protocol for the management of heparin infusion reduced the time needed to achieve therapeutic anticoagulation.

It was clear that there was room for improvement in the percentage of patients achieving a therapeutic aPTT range in less than 24 hours after initiation of heparin infusion, and that this could be accomplished by fully implementing the nurse-driven heparin nomogram protocol.

Goal Statement:

Increase the percentage of patients attaining a therapeutic PTT in less than 24 hours after initiation of heparin therapy through a full implementation of a nurse-driven heparin nomogram protocol.

Description of the Intervention/Initiative/Activity(ies):

Based on the pilot experience, the Anticoagulation Committee revised the protocol. The results of the pilot were presented at the nursing Clinical Practice Committee and the Patient Care Committee in August 2012. The committees endorsed expansion of the nurse-driven heparin nomogram to the remaining adult acute care units.

In the months of September and October 2012, additional work was required to permanently change the support structures for this new process. The Epic team changed order sets and improved arrangement of information in the medication administration record (MAR), and the pharmacy restricted product availability to prevent deviation from best practice.

The adult acute care nurse-driven heparin nomogram was launched in all adult acute care units in November 2012. The education and implementation support mechanisms that were so successful with the pilot were duplicated for the full implementation in November. Surabhi Palkimas, PharmD, Pharmacy Clinical Coordinator in Hematology, and Mary Stack, MSN, RN, FNP, Anticoagulation APN1, provided live education to nurses in our adult acute care areas. Additionally, they worked together to closely monitor anticoagulation outcomes and process issues post-implementation.

Post-Implementation:

Intensive follow-up with nurses on individual patient regimens involving this therapy is conducted by project leaders to assure successful detail management to enhance clinical outcomes.

- During the first month of post-implementation (December 2012), clinical nurses Barbara Trotter, BSN, RN, CMSRN, Clinician IV; Sarah Craig, MSN, RN, CCNS, CCRN, CSC, APN1- CNS; Suzanne Fuhrmeister, MSN, RN-BC, ACNS-BC, BA,



APN1- CNS; and Kim Elgin, MSN, RN, ACNS-BC, PCCN, CMSRN, APN1-CNS, monitored the implementation of the nomogram on all acute care patients. They checked in with staff nurses to answer questions and review practices. They also provided reinforcement and teaching as needed. Any identified issues were communicated centrally for follow-up.

- With the new practice well established, nomogram-driven regimens and off-nomogram utilization are monitored on a daily basis by Mary and Surabhi to ensure appropriate implementation / management.
- Clinical nurse concerns and feedback are reviewed by the oversight committees, and opportunities to coordinate efforts with clinical labs, phlebotomy, Epic and pharmacy systems to further streamline the process are continuously evaluated (ordering, monitoring, management, etc.).
- Mary and Surabhi continue to monitor quality reports and perform individual case follow-up as well as nurse consultation at the bedside as needed for questions.

Participants:

EP21EO Table 1: Participants, Nurse-Driven Heparin Nomogram Initiative

Name	Discipline	Title	Department
Surabhi Palkimas	Pharmacy	PharmD, Clinical Coordinator, Hematology	Pharmacy
Hillary Maitland	Physician	Assistant Professor of Medicine	Hematology / Oncology
Gail Macik	Physician	Professor of Medicine	Pathology
Mary Stack	Nursing	Advanced Practice Nurse 1-Nurse Practitioner	Clinics Operations
Barb Trotter	Nursing	Clinician IV	3 Central / 3 West
Joel Anderson	Nursing	Director	Adult Acute Care
Patti Dewey	Laboratory	Director	Lab Services
Laurie Brock	Nursing	Nursing Informaticist	Epic
Kim Elgin	Nursing	Advanced Practice Nurse 1	5 West
Sarah Craig	Nursing	Advanced Practice Nurse 2	4 West
Suzanne Fuhrmeister	Nursing	Advanced Practice Nurse 1	4 Central
Ben Beitzel	Nursing	Nurse Manager	4 West



Andrea Caulfield	Nursing	Director	Critical Care, Acute Heart units
Holly Hintz	Nursing	Director	Nursing Governance

Outcomes:

Patient outcomes with the nurse-driven heparin nomogram have continued to meet the goal since implementation. As a result, our patients are achieving therapeutic anticoagulation in a timely manner during their hospitalization.

EP21EO Figure 1: Nurse-Managed Heparin Nomogram: Percentage of Patients Achieving Therapeutic Heparin PTT Range in 0-24 Hours, 2Q12-1Q14

