

# Implementation of a Nurse Driven Protocol for Heparin Titration

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## Introduction

Achieving anticoagulation early after a thrombo-embolic event is critical to optimize patient outcomes. Studies demonstrate body weight to be the best predictor of individual heparin requirements and also that use of nurse-driven weight-based heparin nomograms can decrease “time to therapeutic anticoagulation” (TAC) without an increase in risk of complications.<sup>1,2</sup> At this Academic Medical Center, an enterprise-wide electronic health record (EHR) was implemented in May 2015. Prior to this implementation, heparin infusions were ordered as units per hour and orders were written by licensed independent providers (LIP) for all heparin titrations. With implementation of a new EHR, nurse-driven weight-based heparin nomograms were implemented for select IV heparin infusions. To insure a safe transition to this new practice, systematic educational and process measures were taken to prepare all clinical staff for this change in practice.

## Methods

An enterprise wide interdisciplinary team including LIPs, pharmacists, expert nurses and informatics nurses was convened to create and implement a plan for practice change. Interventions included:

- Nursing Informatics (NI) team worked with EHR builders to insure intuitive user interface for nurses
- NI experts, in partnership with EHR training team, created heparin nomogram online learning module which was mandatory for all clinical nursing staff
- NI and clinical team updated Smart Infusion Pump Drug libraries to support new ordering change
- Developed unit-based expert resources through education of nursing super users and clinical nurse educators
- Communication with LIP and pharmacy colleagues
- NI experts developed and implemented “go live” conversion checklist, to be completed by a nurse/pharmacist team caring for any patient who had active heparin infusion at “go-live”
- Daily electronic reports of patients on heparin were sent to clinical educators to review with nursing staff.
- Interdisciplinary team met regularly to review new issues, identify opportunities for real time education, and monitor compliance with nomogram use.

## Results

Despite all preliminary preparation efforts nurses found this transition challenging. For one month post go-live, NI team members made daily rounds with nurses to support the new practice. Data from 317 pre-nomogram patients and 95 post EHR nomogram patients were collected and compared:

- Overall nomogram compliance was 84.6%
- TAC was significantly reduced in nomogram patients when compared with pre-nomogram patients ( $p < 0.005$ ).
- A significant increase in patients who achieved TAC at 24 hours was observed with nomogram vs. pre-nomogram use ( $p = 0.002$ ).
- No significant difference was seen in patients with a PTT  $\geq 120$  seconds while receiving heparin ( $p = 0.73$ ).

## Discussion / Conclusion

Introduction of nurse-driven weight-based heparin nomograms with implementation of a new EHR was a significant practice change for all clinicians and a potential patient safety risk if not implemented thoughtfully. Identification of a dedicated interdisciplinary team with knowledge of targeted interventions proved to be an effective method to insure mitigation of patient risk. Nursing staff were most affected by this change and required dedicated at the elbow support to apply the nomogram successfully. The team continues to monitor use and compliance with nomograms and identify opportunities for continued improvement.

## References

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