Subcutaneous Safety: Improving the appropriateness of VTE prophylaxis dosing for BMI >40

Oklahoma State University Medical Center and Center for Health Sciences | Pharmacy and Therapeutics Committee

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INTRODUCTION

Venous thromboembolism (VTE), encompassing deep vein thrombosis (DVT) and pulmonary embolism (PE), stands as a significant cause of preventable mortality and morbidity on a global scale. Notably, DVT and PE contribute to an annual toll of 60,000 to 100,000 deaths within the United States alone. Hospitalized patients face an elevated risk of VTE compared to their counterparts in the community, underscoring the critical need for diligent DVT prophylaxis in this population. (1)

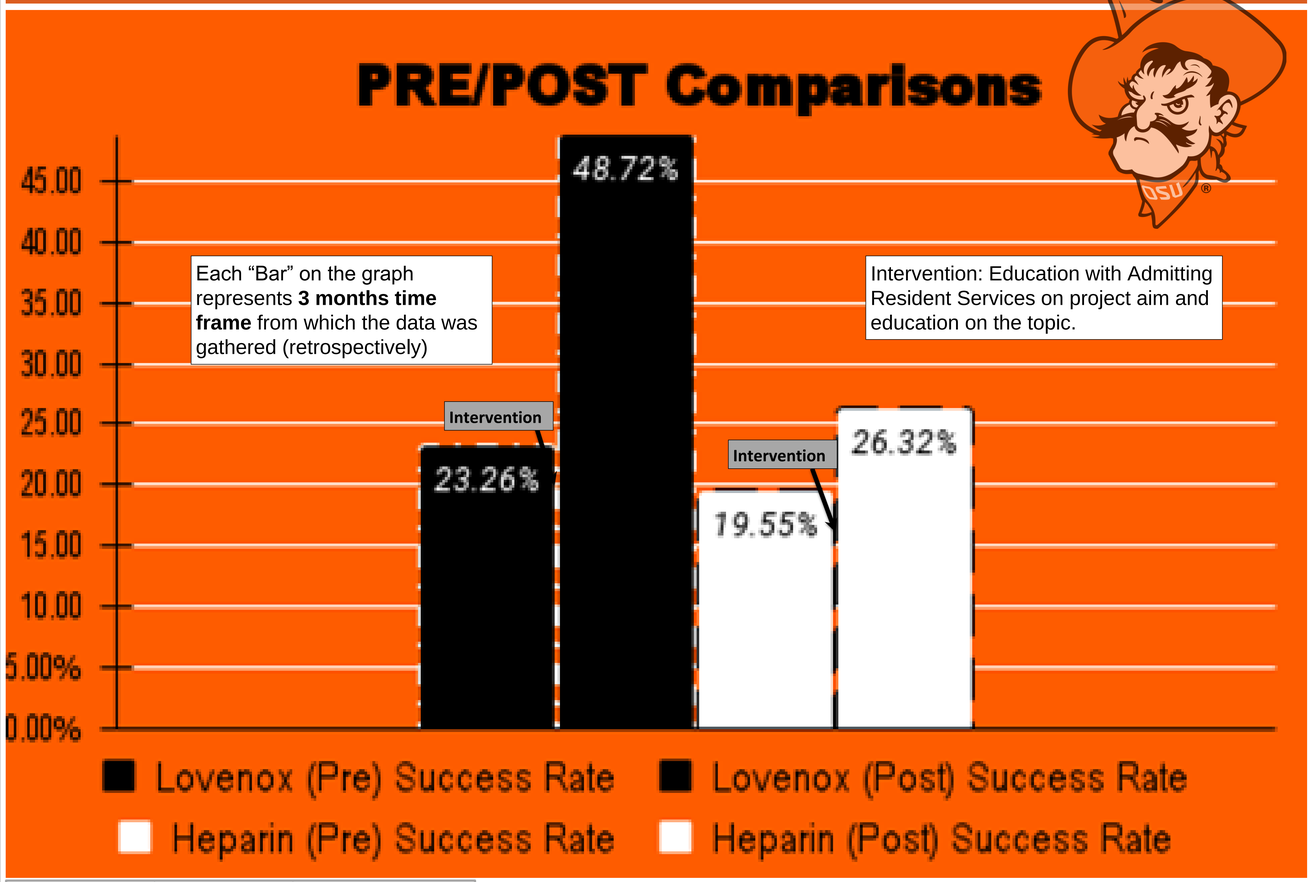
Furthermore, it is important to recognize the heightened risk of VTE associated with obesity. Obesity is known to increase the risk of clot formation due to various factors including impaired blood flow, increased inflammation, and alteration in coagulation systems. As a result, patients with a BMI >40 are particularly vulnerable to VTE complications, emphasizing the importance of tailored prophylactic measures guided by pharmacokinetics in this high risk population.

AIM STATEMENT

This quality improvement (QI) project aims to address the issue of inappropriate DVT prophylaxis dosage among hospitalized patients with a BMI >40. Inadequate dosing **poses an increased risk of DVT complications in this patient population.**

The project will evaluate the incidence of inappropriate DVT prophylaxis dosing **both before and after the implementation of an educational intervention.** Specifically, the intervention will involve conducting educational sessions with resident physicians, who are frequently responsible for prescribing DVT prophylaxis, to ensure adherence to correct dosages and intervals for effective DVT prevention.

RESULTS & DATA ANALYSIS



Lovenox Pre Success	Lovenox Pre Failure	Lovenox Pre Success Rate
40	132	23.26%

Heparin Pre Success	Heparin Pre Failure	Heparin Pre Success Rate
35	144	19.55%

Lovenox Post Success	Lovenox Post Failure	Lovenox Post Success Rate
38	40	48.72%

Heparin Post Success	Heparin Post Failure	Heparin Post Success Rate
10	28	26.32%

CI	High	Low	Statistical Significance
95%	24%	22.09%	Yes
95%	21%	18.58%	Yes

The study revealed statistically significant findings regarding the dosing of DVT prophylaxis in hospitalized patients with a BMI >40. Prior to the intervention, there were instances of both inappropriate and accurate dosing. However, following the implementation of the educational intervention, there was a statistically significant improvement observed in dosing accuracy. This suggests that the intervention was effective in addressing the issue of inappropriate dosing, highlighting the importance of education in optimizing patient care.

One area for improvement would have been accounting for the fluctuations in census that we encountered as we analyzed the data. There were less overall admissions in the POST intervention time frame which did lead to less cumulative charts that fit our criteria.

REFERENCES

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METHODS

- Education was implemented to all admitting services (Family Medicine, General Surgery, Internal Medicine).
- OSU Medical Center EMR, EPIC®, was used for patient identification. The medical records were deidentified.
  - >18yo + BMI >40 on admission
  - Order for lovenox 30 or 40mg OR heparin 7500 units
  - Pre- intervention period: 8/31/2022-12/31/2022
  - Post- intervention period: 3/1/2023-7/1/2023
- Medical charts were assessed for BMI on admission (specified in data), ordered/implemented dosages, appropriateness of dose/timing, and other relevant clinical data (i.e heparin gtt or duplicate data)
- Results were analyzed and summarized to assess improvement in dosing.

CONCLUSIONS & CALL TO ACTION

Given the initial findings indicating **suboptimal dosing accuracy** in prescribing Lovenox and heparin to patients with a BMI exceeding 40, emphasizing the urgent need for **enhanced education** and awareness among healthcare providers. The subsequent improvements observed after the education intervention underscore the effectiveness of targeted interventions in addressing dosing discrepancies.

Moving forward, it's imperative to **prioritize ongoing education and training initiatives** for healthcare professionals regarding dosing protocols for this patient population. Additionally, **adopting standardized guidelines and protocols** can ensure consistency and accuracy in dosing practices across different healthcare settings. One potential next step is **adding the needed dosages** as a ‘preselection’ option in the EMR under a VTE order set. (There is currently not a ‘7500u Heparin’ to select- this is for patients with BMI >40). Lastly, there is potential to extend the study for a longer time frame to further validate these findings. By collectively addressing these issues, we can **enhance patient safety** and optimize clinical outcomes for individuals with high BMI requiring VTE prophylaxis.

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