**Title:** Evaluation of a Pharmacist-Driven Venous Thromboembolism (VTE) Prophylaxis Therapeutic Interchange Protocol and the Inclusion of Surgically Ill Patients

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**Purpose/Background:** A venous thromboembolism (VTE) is a blood clot that develops in a deep vein that may lead to local venous occlusion; this thrombosis also has the potential to break off and travel to the lungs, which can result in blockage of a pulmonary vessel and result in death. Virchow's Triad describes three overarching risk factors leading to VTE development – stasis, vessel wall injury, and hypercoagulability. Obesity contributes to vessel wall injury through the release of inflammatory factors from adipose and also increases hypercoagulability via the increase in levels of procoagulant factors and decreases in fibrinolysis. Patients with Class III obesity (≥40 kg/m$^2$) are at highest risk, as VTE risk increases linearly with BMI. VTE prophylaxis is an important method of reducing VTE incidence while patients are admitted to hospitals, as prolonged immobilization also increase VTE risk. Recommendations surrounding optimal dosing for VTE prophylaxis in the morbidly obese population are inconsistent, but evidence does suggest that weight-based adjustments to higher prophylactic doses of enoxaparin and heparin in medically and surgically ill patients leads to decreased VTE risk without increases in adverse events. A pharmacist-driven therapeutic interchange protocol was implemented in February 2021 at CVHCS that allows pharmacists to order, adjust, and monitor VTE prophylactic agents in eligible patients with Class III obesity. The purpose of this project is to evaluate the outcomes of this protocol that currently excludes surgical patients and to examine the utility of expanding this protocol to include surgical patients.

**Objective:**

- *Primary:* Determine the percentage of patients before and after implementation of this interchange on the optimal weight-adjusted dose to meet VTE prophylactic needs.
- *Secondary:* Evaluate VTE, mortality, major bleeding, and heparin-induced thrombocytopenia (HIT) incidence.

**Methods:** Patients were separated into two groups, pre-implementation and post-implementation. The pre-implementation population was identified through the use of data informatics, which included all patients with BMI ≥40 kg/m$^2$ receiving prophylactic doses of enoxaparin or heparin. Data informatics excluded patients if they were COVID-19 positive, spinal cord injury (SCI) patients, pregnant patients, patients with current or recent epidural use (≤12 hours of epidural removal), surgery patients, patients who underwent acute VTE treatment, patients diagnosed with heparin-induced thrombocytopenia (HIT) prior to or during admission, or patients with a baseline hemoglobin at admission <8 g/dL or platelets <50,000 per mL. Patients were identified as having HIT, COVID-19, an active VTE, or as a SCI patient through the use of ICD-10 codes and retrospective chart review. The post-implementation population was identified using identical methodology. A secondary analysis was performed for surgical patients using the same methodology, but admission to a surgical unit was added to inclusion criteria.

**Preliminary Results:** There were 117 patients identified in the primary analysis pre-implementation group who could have possibly been considered for inclusion in this protocol. After further examination, 10 were found to be eligible based on the exclusion criteria. Of the 10 eligible patients, 30% were optimally dosed for VTE prophylaxis with no incidences of HIT, mortality, or major bleeding identified. There were 166 potential patients in the post-implementation population with 52 patients eligible for inclusion. Of these 52 patients, 60.6% were found to be on the optimal VTE prophylactic dose with no incidences of VTE, HIT, mortality, or major bleeding identified. A $\chi 2$ test of independence was performed and a *p*-value of 0.089 was obtained. The secondary pre-implementation analysis of surgical patients identified 177 patients eligible for inclusion, with 100 patients after consideration of exclusion criteria. Of these 100 surgical patients, 10% were optimally dosed for VTE prophylaxis with 1 major bleeding event identified in the standard-dose group. No incidences of VTE, HIT, mortality, or major bleeding were identified in the high-dose group.

**Conclusion:** The percentage of patients on the optimal weight-adjusted dose of VTE prophylaxis following implementation of this interchange increased. The increase of patients with Class III obesity on the optimal VTE prophylaxis dose was not correlated with an increase in VTE, HIT, mortality, or major bleeding events. The utilization of optimal VTE prophylaxis dosing for patients with Class III obesity undergoing surgical procedures is low, highlighting a patient population that may benefit from inclusion in this pharmacist-driven interchange.