

# Evaluation Of Missed Doses Of Pharmacologic Venous Thromboembolism Prophylaxis And The Incidence Of Venous Thromboembolism In Patients With Traumatic Orthopedic Injuries

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## Background

- Trauma continues to be a significant contributing factor in death in the younger population, accounting for the leading cause of preventive death in people younger than forty- four (1).
- It has been extensively studied that physical trauma places patients in a hypercoagulable state (2).
- Many factors contribute to venous thromboembolism, or VTE, rates, and can be as high as 65% in the absence of thromboprophylaxis (3).
- Advocate Christ Medical Center's (ACMC) Department of Orthopedic Surgery has subjectively observed increased amounts of intraoperative bleeding with enoxaparin administration and ACMC's VTE prophylaxis guidelines for trauma patients were modified due to the orthopedic surgeons' concerns.
- Previously, VTE prophylaxis for all trauma patients at ACMC was administered pre- and post-orthopedic intervention without interruption.
- Now, all trauma patients at ACMC undergoing orthopedic surgery have their VTE prophylaxis dose held immediately before surgery.
- To date, only a few studies have examined the impact of missed prophylactic doses on patients, specifically trauma patients.

## Disclosures

Authors of this presentation have nothing to disclose concerning possible financial or personal relationships with commercial entities that may have a direct or indirect interest in the subject matter of this presentation.

## Purpose

**Primary objective:** to examine the relationship between missed prophylactic enoxaparin doses and rates of VTE formation in the orthopedic trauma population at ACMC

**Secondary objective:** to determine if there is an increase in the incidence of bleeding complications during orthopedic surgery in patients with traumatic orthopedic injuries who receive pharmacologic VTE prophylaxis pre- and post-operatively

## Methods

- IRB-approved, single center, retrospective review
- Data pulled from trauma registry and electronic medical records for all trauma patients
- January 1, 2010 – July 31, 2021
- Patients with orthopedic injuries admitted to ACMC under the care of the trauma service

Inclusion Criteria	Exclusion Criteria
<ul style="list-style-type: none"><li>• Patients admitted to the trauma service with an orthopedic injury (long bone or pelvic fractures)</li><li>• 1/1/2010-07/31/21</li><li>• Age <math>\geq</math> 18 years</li><li>• Patient undergoes orthopedic surgery during the hospital stay</li></ul>	<ul style="list-style-type: none"><li>• Pregnancy</li><li>• History of venous thromboembolism</li><li>• Contraindications to pharmacologic VTE prophylaxis (thrombocytopenia (<math>&lt;</math>50K), history of heparin induced thrombocytopenia, presence of a spinal epidural hematoma, allergy to enoxaparin or heparin)</li><li>• Patients receiving therapeutic anticoagulation or anti-platelets pre-injury (therapeutic dose enoxaparin, heparin infusion, warfarin, dabigatran, rivaroxaban, apixaban, ticagrelor, aspirin, clopidogrel, and prasugrel)</li></ul>

## Outcomes

- **Primary endpoint:** incidence of VTE (DVT/PE)
- **Secondary endpoint:** incidence of bleeding complications

## Results

- 79 patients included
- 61 patients (77%) experienced interruption in enoxaparin prophylaxis
- 3 patients (3.8%) developed a VTE
- 0% VTE rate (0/18 patients) in the uninterrupted therapy group vs. 5% VTE rate (3/61 patients) in the interrupted therapy group
- Median (ICQ) number of missed doses of VTE prophylaxis was 1 (1-3) in the no VTE group compared with 3 (2-7) in the VTE group (**p=0.08**)
- Statistically significant increase in the median (ICQ) hospital length of stay in the VTE group compared to the no VTE group (12 (12-19) vs. 5 (3-8), **p=0.01**)
- No statistically significant difference in coagulation variables
- 16.7% (3/18) of patients in the uninterrupted group required an intervention due to bleeding vs. 0.03% (2/61) of patients in the interrupted therapy group
- Median (ICQ) number of surgeries was significantly higher in the VTE group compared to the no VTE group (3 (2-4) vs. 1(1-1), **p = 0.0003**)

## Conclusions

- There is a trend towards an increase in VTE rates with interrupted VTE prophylaxis doses.
- Patients who develop a VTE may have an increased hospital length of stay.
- More than one orthopedic surgery significantly increases VTE rate.

## References

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