



# Evaluating BID versus TID Low Dose Unfractionated Heparin for VTE Prophylaxis in Elderly Hospitalized Patients

SCHOOL OF PHARMACY

Darby Hobbs, Pharm.D. Candidate 2025; Danielle Bozzardi-Jerome, Pharm.D.,BCPS; Maryam Molki Pharm.D.; Brandon Mullins Pharm.D. BCCCP

## Introduction<sup>1,2,3</sup>

- Venous thromboembolism (VTE) prophylaxis is used to mitigate the risk of VTE events, which are deep vein thrombosis (DVT) and pulmonary embolism (PE). Hospitalized individuals have an increased VTE risk.
- Based on the CHEST guidelines, it is recommended that hospitalized patients with risk factors receive VTE prophylaxis.
- Elderly patients have an increased risk of both VTE and major bleeding complications.
- There is limited data on the use of VTE prophylaxis in elderly hospitalized patients.

## Objectives

- To evaluate the efficacy and safety of twice daily (BID) and thrice daily (TID) dosing of subcutaneous low dose unfractionated heparin (LDUH), 5000 units, for VTE prophylaxis in elderly (65 and older) hospitalized patients.
- To evaluate how body weight impacts VTE and bleeding events in this patient population.

## Methods

### Design

- Single-center, retrospective chart review
- IRB approval obtained
- Data collection performed through electronic medical records

Inclusion	Exclusion
<ul style="list-style-type: none"> <li>• Patients who received LDUFH for VTE prophylaxis for a minimum of 48 consecutive hours during hospital stay</li> <li>• 65 years or older</li> </ul>	<ul style="list-style-type: none"> <li>• ICU and surgical patients</li> <li>• Baseline platelets &lt; 50 x 10<sup>9</sup>/L</li> <li>• Patients who refused greater than or equal to 50% of their LDUFH doses</li> <li>• Patients who received concomitant anticoagulation</li> </ul>

### Primary Outcome

- A composite of VTE and major bleed events that occurred within 48 hours of last heparin dose
  - VTE event: DVT or PE occurring during admission while on VTE prophylaxis confirmed by venous doppler ultrasound (DVT) or CT angiogram (PE)
  - Bleeding event: Any major bleeding event that caused a fall in Hb of 2 or more, a transfusion of 2 or more units PRBC, bleeding into a major anatomic site or fatal bleeding

### Secondary Outcomes

- Major bleed rate
- VTE event rate
- Subgroup analysis
  - Composite of VTE and major bleed rate in low body weight and obese patients
  - Body weight <50 kg, BMI >30 kg/m<sup>2</sup>, and BMI equal or greater than 40 kg/m<sup>2</sup>

### Data Analysis

- Study outcomes: Fisher's Exact test
- Baseline characteristics: Chi-square test or Student's T-test

## Results

### Study Population

Figure 1. Patient Population

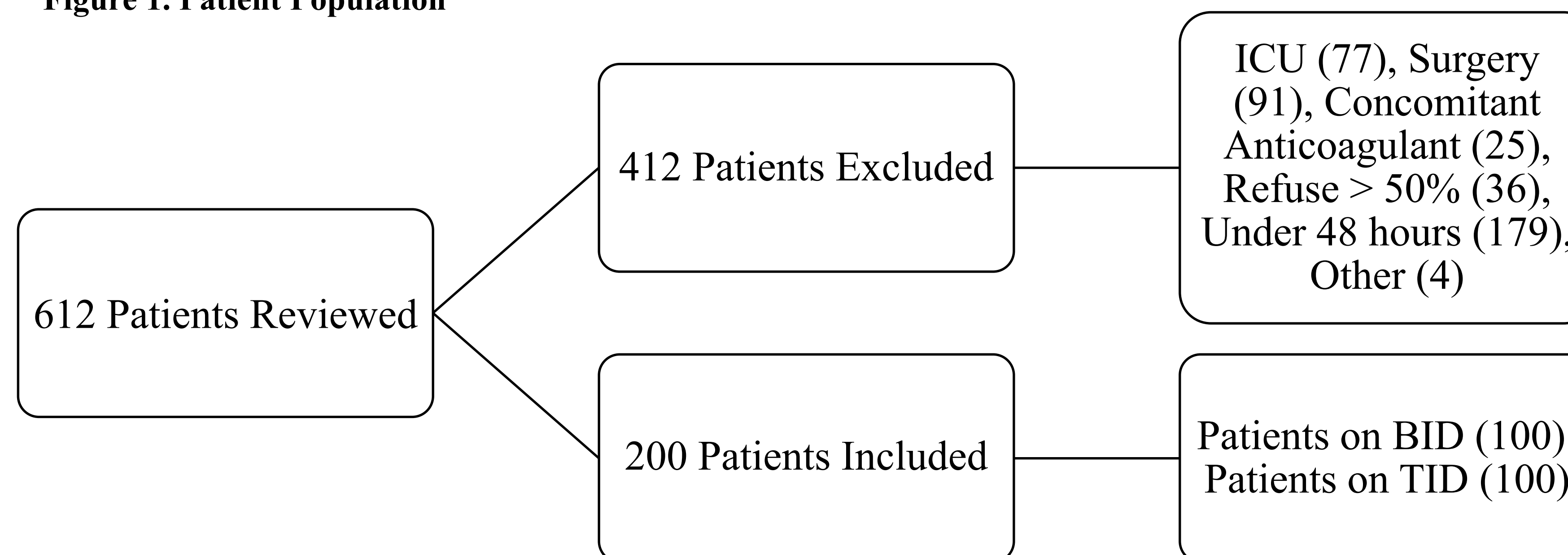


Table 1. Patient Demographics (n=200)

Characteristics	BID (n=100)	TID (n=100)	p-value
Age (years)	80	81	0.571
Female (no.)	62	56	0.388
Weight (kg)*	69.7	78.0	0.006
BMI (kg/m <sup>2</sup> )	27	28	0.439
BMI 30 – 34 kg/m <sup>2</sup> (%)	15	15	1
BMI 35-39 kg/m <sup>2</sup> (%)	3	4	0.700
BMI equal or >40 kg/m <sup>2</sup> (%)	2	8	0.052
Body weight <50 kg (%)	15	3	0.003
Doses Received (%)*	92.5	88.8	0.028
Duration of Treatment (days)*	6.1	4.8	0.004
Antiplatelet Therapy (no.)	53	54	0.887
Hormone Replacement (no.)	1	0	0.316
Steroids (no.)	30	22	0.365
SSRI (no.)	26	24	0.744
SNRI (no.)	13	13	0.978
NSAIDs (no.)*	4	15	0.027
Active Malignancy (no.)	13	18	0.329
PUD (no.)	3	2	0.651
Hx of GIB (no.)	6	6	1
Hx of DVT (no.)	4	9	0.152
Hx of PE* (no.)	0	4	0.042
CVA (no.)	6	13	0.091
Cirrhosis (no.)	1	4	0.174
Baseline Platelet Count (x10 <sup>9</sup> /L)	228.3	235.3	0.579
Baseline Hemoglobin (g/dL)	11.4	13.5	0.237

### Outcomes

Table 2. Primary Outcome

	BID (n=100)	TID (n=100)	p-value
Composite of VTE and Major Bleed Events no. (%)	0 (0%)	3 (3%)	0.246

Table 3. Secondary Outcomes

	BID (n=100)	TID (n=100)	p-value
Major Bleed rate no. (%)	0 (0%)	1 (1%)	1.00
VTE Event rate no. (%)	0 (0%)	2 (2%)	0.497

Table 4. Subgroup Analysis for Primary Outcome

	BID	TID	p-value
BMI >30 kg/m <sup>2</sup> no. (%)	0	1 (2%)	0.373
BMI >40 kg/m <sup>2</sup> no. (%)	0	0	NA
Weight < 50 kg (%)	0	0	NA

## Limitations

Study limitations included small sample size, single institution, and a retrospective study design.

## Summary

- No significant difference in venous thromboembolism events or major bleed between low dose (5,000 units) twice vs thrice daily subcutaneous heparin in elderly hospitalized patients.
- Prescribing trends indicated that higher body weight patients were more likely to receive thrice daily dosing.
- Patients who were on twice daily dosing were less likely to miss or refuse a dose compared to those in the thrice daily dosing group suggesting improved adherence.
- Further investigations are needed to evaluate the impact of body weight and adherence on regimen selection for thrice daily versus twice daily subcutaneous heparin.

## References

1. What is venous thromboembolism?. [www.heart.org](https://www.heart.org/en/health-topics/venous-thromboembolism/what-is-venous-thromboembolism-vte2). (2024, February 26). <https://www.heart.org/en/health-topics/venous-thromboembolism/what-is-venous-thromboembolism-vte2>.
2. Kearon C, Akl EA, Comerota AJ, et al. Antithrombotic therapy for VTE disease: Antithrombotic Therapy and Prevention of Thrombosis, 9th ed: American College of Chest Physicians Evidence-Based Clinical Practice Guidelines [published correction appears in Chest. 2012 Dec;142(6):1698-1704]. *Chest*. 2012;141(2 Suppl):e419S-e496S.3.
3. Kahn SR, Lim W, Dunn AS, Cushman M, Dentali F, Akl EA, Cook DJ, Balekian AA, Klein RC, Le H, Schulman S, Murad MH. Prevention of VTE in nonsurgical patients: Antithrombotic Therapy and Prevention of Thrombosis, 9th ed: American College of Chest Physicians Evidence-Based Clinical Practice Guidelines. *Chest*. 2012 Feb;141(2 Suppl):e195S-e226S. doi: 10.1378/chest.11-2296. PMID: 22315261; PMCID: PMC3278052.