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Evaluation of prophylactic enoxaparin dosing in the obese patient population

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Background

- Utilize prophylactic anticoagulation to decrease the risk of developing venous thromboembolism (VTE) in hospitalized patients.
- Obesity remains an independent risk factor for developing VTE.
- Patients with a body mass index (BMI) ≥ 30 kg/m^2 have a two to three times increased risk for developing VTE, with further increased risk when BMI ≥ 40 kg/m^2.
- Literature recommends increased prophylactic enoxaparin doses in patients with BMI ≥ 40 kg/m^2
  - Patients with BMI 40 to < 50 kg/m^2 use enoxaparin 40mg twice daily
  - Patients with BMI ≥ 50 kg/m^2 use enoxaparin 60mg twice daily
- Literature recommends trauma patients receive prophylactic enoxaparin 30mg twice daily initiated within 24 hours upon hemostasis.
- Venous Thromboembolism Prophylaxis Guideline at New Hanover Regional Medical Center (NHRMC) addresses prophylactic enoxaparin doses in patients with BMI ≥ 40 kg/m^2 and trauma patients
- NHRMC has an anti-Xa Level monitoring guideline considered for use in obese patients with anticipated treatment of prophylactic enoxaparin for 10 days or more.
  - Goal anti-Xa level: 0.2 – 0.5 IU/mL drawn 4-6 hours after administration

Objectives

- Evaluate the current prescribing trends and appropriate dosing in the obese patient population at New Hanover Regional Medical Center
- Assess the appropriateness of anti-Xa levels ordered in obese patients receiving enoxaparin
- Evaluate the number of bleeding and clotting events in obese patients

Methods

- **Study design:** Retrospective, single-center, IRB exempt quality improvement study
  - Conducted from January 1, 2020 to March 31, 2020
- **Inclusion**: Patients 18 years of age and older, with a BMI of ≥ 30 kg/m^2 located in the medical or surgical/trauma intensive care units (ICU) who received at least one dose of prophylactic enoxaparin
- **Exclusion:** Patients admitted to the ICU for less than 24 hours, pregnant, receiving hemodialysis or continuous renal replacement therapy, or had therapeutic enoxaparin administered within 48 hours of admission
- **Statistics:** Endpoints analyzed through descriptive statistics

Minor Bleed	Major Bleed	Clotting Event
Any bleeding documented in the medical record not meeting criteria for major bleeding	Overt bleeding, acute anemia with a ≥ 2g/dL reduction in hemoglobin, or requirement of transfusion or reoperation	VTE as defined by ICD codes and/or through diagnostic imaging

Results

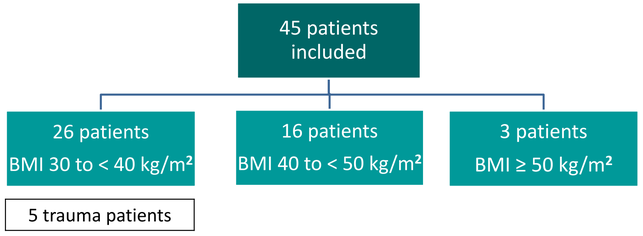


Figure 1: Overall Appropriateness of Initial Enoxaparin Dose (%) (n=45)

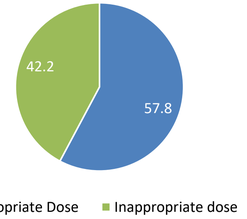


Table 1: Initial Dosing Regimens

Enoxaparin BMI (kg/m^2)	30mg daily		30mg twice daily		40mg daily		40mg twice daily		60mg twice daily	
	Patients (n)	Prevalence (%) Appropriate	Patients (n)	Prevalence (%) Appropriate	Patients (n)	Prevalence (%) Appropriate	Patients (n)	Prevalence (%) Appropriate	Patients (n)	Prevalence (%) Appropriate
30 to < 40	0	N/A	1	100	25	92	0	N/A	0	N/A
40 to < 50	1	0	1	0	11	0	2	100	1	0
≥ 50	0	N/A	0	N/A	2	0	1	0	0	N/A
Trauma Patient	5	20	0	N/A	0	N/A	0	N/A	0	N/A

Figure 2: Percent of Appropriate Dosing and Lab Draws per BMI

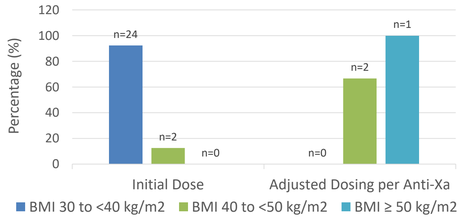
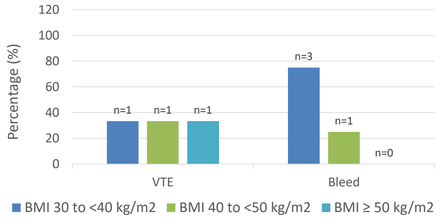


Figure 3: Percent of VTE and Bleed Events



- No anti-Xa levels were drawn in patients who had a VTE or bleed event.

Table 2: Patients with Anti-Xa Levels Drawn

BMI (kg/m^2)	30 to < 40	40 to < 50	≥ 50	Trauma Patients
Patients (n)	0	3	1	0
% Anti-Xa Level Drawn	0	18.75	33.33	0

Discussion

- Current initial prophylactic enoxaparin doses are not consistent with the NHRMC Venous Thromboembolism Prophylaxis Guideline recommendations for patients with obesity
- Initial dose of enoxaparin was dosed appropriately in 57.8% of patients
  - 92.3% in patients with BMI 30 to < 40 kg/m^2
  - 12.5% in patients with BMI 40 to < 50 kg/m^2
  - 0% in patients with BMI ≥ 50 kg/m^2
- Only one trauma patient received the recommended dose of enoxaparin 30mg twice daily within 24 hours of admission and surgery
- Anti-Xa levels are not being drawn succinctly to evaluate if prophylactic enoxaparin doses are within goal
  - Anti-Xa levels were utilized in only 8.9% of all patients
  - Only 22.2% of patients with BMI ≥ 40 kg/m^2 had an anti-Xa level drawn
- No anti-Xa levels were drawn prior to VTE or bleed event occurrence

Conclusion

- Revision of the current VTE guideline with protocol and policy development for pharmacist dosing plus recommendations for anti-Xa level ordering and dose adjustment per resulting level is needed
- Recommend to create accessible documentation pathway per pharmacy department and provider approval
- Provide pharmacy department education on appropriate dosing, monitoring through anti-Xa levels, and dose adjustments

References

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Disclosure

All 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.

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