

# FPIN's Help Desk Answers

## High-Dose vs. Standard-Dose Heparin for VTE Prophylaxis in Obese Patients

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### Clinical Question

Is high-dose heparin better than standard-dose heparin in reducing the incidence of venous thromboembolism (VTE) in obese inpatients?

### Evidence-Based Answer

In most patients weighing more than 220 lb (100 kg), high-dose heparin prophylaxis (7,500 units subcutaneously three times per day) does not further reduce the risk of VTE compared with standard-dose heparin (5,000 units subcutaneously two or three times per day). In patients with a body mass index (BMI) greater than 40 kg per m<sup>2</sup>, higher doses of heparin or enoxaparin (Lovenox) reduce VTE risk more than standard doses of heparin or enoxaparin. (Strength of Recommendation: B, based on retrospective cohort studies.)

### Evidence Summary

A 2016 retrospective cohort study included 2,378 obese adult inpatients receiving subcutaneous heparin for VTE prophylaxis.<sup>1</sup> The patients were divided into high-dose (7,500 units three times per day; n = 196) and standard-dose (5,000 units three times per day; n = 2,182) groups. Patients were excluded if they were receiving enoxaparin or therapeutic anticoagulation; if they were admitted with VTE or bleeding; if they were

pregnant, peripartum, imprisoned, or paraplegic; if they had a history of heparin-induced thrombocytopenia; or if they underwent surgery. Major bleeding was defined as a hemoglobin decrease of at least 2 g per dL (20 g per L) in 24 hours, transfusion of at least two units of blood products, or critical bleeding (e.g., intracranial, gastrointestinal). Any documented bleeding that did not meet the criteria for major bleeding was considered minor bleeding. Rates of VTE within 30 days of hospitalization did not differ significantly between the high-dose and standard-dose groups (1.0% vs. 0.23%, respectively; *P* = .05), nor did rates of major or minor bleeding (0% vs. 0.09%; *P* = .67).

A 2014 retrospective cohort study of adult medical and surgical inpatients weighing at least 220 lb compared 2,461 patients receiving subcutaneous high-dose heparin (7,500 units three times per day) or enoxaparin (40 units two times per day) with 6,780 patients receiving standard-dose heparin (5,000 units two or three times per day) or enoxaparin (40 units per day) for VTE prophylaxis and bleeding.<sup>2</sup> Patients with renal insufficiency (creatinine clearance less than 30 mL per minute), pregnancy, or VTE treatment within 48 hours of admission were excluded. Overall, there was no difference in the risk of in-hospital VTE in the high-dose arm vs. the standard-dose arm (1.2% vs. 1.5%, respectively;

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*P* = .22). However, patients with BMI greater than 40 kg per m<sup>2</sup> (n = 3,928) had reduced rates of VTE with high-dose heparin compared with the standard dose (odds ratio = 0.52; 95% confidence interval, 0.27 to 1.0; number needed to treat = 141). There was no difference between groups in rates of bleeding.

A 2016 retrospective cohort study of adult medical and surgical inpatients weighing more than 220 lb compared 751 patients receiving subcutaneous high-dose heparin (7,500 units three times per day) with 584 patients receiving standard-dose heparin (5,000 units three times per day) for VTE prophylaxis and bleeding.<sup>3</sup> Patients were excluded if they were receiving enoxaparin or anticoagulation, were hospitalized less than 48 hours, or had a history of atrial fibrillation or VTE. In-hospital VTE rates did not differ significantly between the high-dose and standard-dose groups (3.0% vs. 1.5%, respectively; *P* = .14).

A hemoglobin decrease of at least 2 g per dL in any 24-hour period was greater in the high-dose group (10% vs. 7%; *P* < .01; number needed to harm = 33).

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## References

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