

PHARMACIST-MANAGED CLINICAL REFERENCE

Enoxaparin dosing nomogram and obesity considerations

Scope. Pharmacist-managed enoxaparin dose adjustment and anti-Xa monitoring: maximum dosing in morbid obesity, automatic prophylactic adjustments, therapeutic and prophylactic nomograms, pregnancy considerations, and criteria for monitoring. Adjusted orders carry the comment **Dose adjustment per P&T**.

1 Maximum initial dose in morbidly obese patients refs 1, 2, 4, 5

- a. A maximum initial dose of **200 mg q12h** applies to patients ≥ 200 kg receiving therapeutic enoxaparin (1 mg/kg q12h). If a dose greater than 200 mg is ordered, pharmacists adjust the dose to 200 mg at verification with the order comment **Dose adjustment per P&T** (, dosept). **NO PROVIDER COSIGN**
- b. A Senti7 rule identifies patients with BMI > 40 kg/m² who have received enoxaparin for > 24 hours and have any active enoxaparin order (excluding 30 mg q12h or q24h). Pharmacists then evaluate the need for anti-Xa monitoring. An anti-Xa level should be ordered for any patient receiving therapeutic enoxaparin with a BMI > 40 kg/m² captured by the rule.
- c. When anti-Xa monitoring is warranted, the level is typically ordered following the 3rd or 4th dose.
- d. Resulting anti-Xa levels are assessed by the pharmacist using the enoxaparin dosing nomogram (Section 3).

2 Automatic adjustment of prophylactic enoxaparin in obese patients refs 1, 3

- a. At verification of prophylactic enoxaparin orders, pharmacists review weight, height, and BMI to consider whether an increased prophylactic dose is warranted.
- b. For medical patients with CrCl ≥ 30 mL/min and BMI ≥ 40 kg/m², prophylactic enoxaparin (40 mg daily) is automatically converted to **40 mg q12h** with the order comment **Dose adjustment per P&T**. **NO PROVIDER COSIGN**
- c. A Senti7 rule identifies patients receiving enoxaparin whose BMI ≥ 40 kg/m². Pharmacists evaluate the need for increased prophylactic dosing when reviewing Senti7.
- d. Routine anti-Xa monitoring for prophylactic enoxaparin is not required unless there is suspicion for abnormal values (e.g., AKI, new thrombosis, bleeding).
- e. **Exclusions:** renal insufficiency (CrCl < 30 mL/min) requiring 30 mg q24h prophylaxis. Postoperative orthopedic, cardiothoracic, trauma, and general surgery patients follow service-specific VTE prophylaxis pathways and are outside the automatic obesity adjustment and prophylactic nomogram workflow.

3 Dosing nomogram for therapeutic enoxaparin refs 6, 7, 8

- a. Pharmacists may order anti-Xa levels for patients per current P&T policy.
- b. When a pharmacist orders a level, the pharmacist leaves an open intervention to identify the level as pending and prompt follow-up.
- c. Use the nomogram below to assess anti-Xa results. Before changing a dose, the pharmacist contacts the provider and rounds the new dose to the nearest 10 mg. Enter the order with **Dose adjustment per P&T** and **Provider Cosign Required**.
- d. For a follow-up anti-Xa level after a dose adjustment, order the level once steady state has been reached. This is typically after at least 3 doses of the new regimen.

ANTI-XA LEVEL (UNITS/ML)	HOLD NEXT DOSE	DOSAGE CHANGE
< 0.35	No	Increase by 25%
0.35–0.49	No	Increase by 10%
0.50–1.09*	No	No change TARGET
1.10–1.50	No	Decrease by 20%
1.51–2.00	3 hours	Decrease by 30%
> 2.00	Contact provider to develop a plan or discuss alternatives (e.g., IV heparin infusion). If the provider elects to continue enoxaparin, suggest anti-Xa levels every 12 hours until < 0.5 units/mL, then restart enoxaparin with the dose reduced by 40%.	

* Target concentration for 1 mg/kg twice-daily treatment dosing.

4 Dosing nomogram for prophylactic enoxaparin ref 1

- a. For monitored prophylactic enoxaparin, use the nomogram below. Before changing a dose, contact the provider, round to the nearest 10 mg, and enter the order with **Dose adjustment per P&T** and request provider cosign. **Provider Cosign Required.**
- b. For a follow-up anti-Xa level after a dose adjustment, order the level once steady state has been reached. This is typically after at least 3 doses of the new regimen.
- c. Routine anti-Xa monitoring for prophylactic enoxaparin is not required unless there is suspicion for abnormal values (e.g., AKI, new thrombosis, bleeding).

ANTI-XA LEVEL (UNITS/ML)	HOLD NEXT DOSE	DOSAGE CHANGE
< 0.20	No	Increase by 25%
0.20–0.50*	No	No change TARGET
0.51–1.00	3 hours	Receiving 30 mg q24h — contact provider to discuss alternatives. Receiving 40 mg q24h — decrease to 30 mg q24h. Receiving another prophylactic dose — decrease by 25%; round to the nearest 10 mg.
> 1.00	Contact provider to develop a plan or discuss alternatives (e.g., subcutaneous heparin).	

* Target concentration for prophylactic dosing.

LIVER DISEASE — APPLIES TO BOTH NOMOGRAMS

There is a lack of data to support anti-Xa monitoring in acute or chronic liver disease to estimate therapeutic effect. Anti-Xa levels should not be used to up-titrate dosing, given the concern for falsely low values and the risks of dose escalation in these patients.

5 Considerations in pregnancy ref 9

- Pharmacists will **not** automatically adjust enoxaparin orders in a pregnant patient based on BMI or anti-Xa levels using these nomograms.
- If an anti-Xa level is abnormal in a pregnant patient, contact the prescriber to discuss dose adjustments.
- Various strategies exist for VTE prophylaxis in pregnancy. The dosing strategies below may be recommended to a provider.

PROPHYLACTIC DOSE — BY BOOKING OR CURRENT WEIGHT

< 50 kg	20 mg daily
50–90 kg	40 mg daily
91–130 kg	60 mg daily*
131–170 kg	80 mg daily*
> 170 kg	0.6 mg/kg/day*

* May be given in 2 divided doses.

OTHER DOSING STRATEGIES

Intermediate: 40 mg q12h

Adjusted (therapeutic): 1 mg/kg q12h

TARGET ANTI-XA IN PREGNANCY

Prophylactic: 0.2–0.6 units/mL

Therapeutic: 0.6–1.0 units/mL

Peak level, drawn 4 hours after a dose. If abnormal, contact the prescriber.

EVIDENCE NOTE — HIGHLOW TRIAL · REF 12

The Highlow trial (Bistervels et al., *Lancet* 2022) randomized 1,110 pregnant women with prior VTE to weight-adjusted intermediate-dose or fixed low-dose LMWH. Recurrent VTE did not differ (2% versus 3%; RR 0.69, 95% CI 0.32–1.47), and major bleeding was similar (4% versus 4%). The authors concluded that low-dose LMWH is the appropriate dose for preventing pregnancy-related recurrent VTE.

6 Considerations for anti-Xa monitoring ref 6

Enoxaparin pharmacokinetics are relatively predictable, and routine anti-Xa monitoring is not recommended. The scenarios below may warrant a level. This list is not all-encompassing — pharmacists should use clinical judgment when deciding whether an anti-Xa level is warranted.

SCENARIOS THAT MAY WARRANT A LEVEL

- Obesity — BMI ≥ 40 kg/m² or > 150 kg
- New or worsening bleeding
- Development of a new thrombus (e.g., DVT, PE)
- Significant renal impairment or acute kidney injury (ref 11)
AKI criteria: serum creatinine increase ≥ 0.3 mg/dL within 48 hours; or increase to $\geq 1.5\times$ baseline within the prior 7 days; or urine volume < 0.5 mL/kg/hour for 6 hours. Enoxaparin can be dosed once daily when CrCl < 30 mL/min (ref 10).

PROPHYLACTIC DOSE AND RENAL ADJUSTMENT

Patients on prophylactic enoxaparin requiring renal dose adjustment do not typically benefit from anti-Xa monitoring. Consider a level if renal dysfunction is sustained with a dose adjustment for more than 4 days.

TREATMENT DOSE — MODERATE RENAL INSUFFICIENCY

Patients with CrCl 30–60 mL/min may accumulate enoxaparin and may benefit from anti-Xa monitoring after 4 days of therapy. If the level is acceptable, additional levels are not necessary unless the patient's status changes.

References

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For clinician reference; individualize to the patient. This is a guidance document; it does not replace clinical judgment or a documented order.