

Enoxaparin (Low MW Heparin) Guidelines

The following are guidelines for initiating and monitoring Enoxaparin (Lovenox) therapy. **Modifications for individual circumstances may be necessary.** These guidelines pertain only to Enoxaparin and cannot be extrapolated to other low molecular weight heparins.

Low Molecular Weight Heparin Dose (see nomogram below)

1. Obtain patient's weight.
2. Dose: Lovenox has 110 anti Xa units per mg

	Adults
Treatment Dose	
Normal renal function	1 mg/kg/dose q 12 h or 1.5 mg/kg/dose q 24 h in DVT patients only
Cr CL < 30 ml/min	1 mg/kg/dose q 24 h
Prophylactic Dose	0.5 mg/kg/dose or 40 mg daily

Maximum dose is 2.0 mg/kg/dose BID. **If still no response after attaining this dose, consult hematology.**

Monitoring of Low Molecular Weight Heparin in renal failure and obese patients

1. Bloodwork to be done after drug administration: PLEASE draw blood from fresh venipuncture. **THERE MUST BE NO CONTAMINATION FROM** standard heparin; e.g., from arterial line.
2. On day 2, a blood sample should be drawn 4 hours after the SQ administration of Enoxaparin. If therapeutic, a weekly check on the anti-factor Xa level is sufficient.
3. The therapeutic anti-Xa level for treatment dose therapy is 0.7-1.1 units/mL. The target anti Xa level for prophylactic dose therapy is 0.2-0.3 units/mL.
4. For patients on long term Enoxaparin therapy (> 3 months), consider bone densitometry studies at baseline and then every 6 months to assess for possible osteoporosis.

Enoxaparin Antidote

If anticoagulation with Enoxaparin needs to be discontinued for clinical reasons, termination of the SC injection will usually suffice. **If an immediate effect is required, protamine sulfate has not been shown to completely reverse Enoxaparin.** Equimolar concentrations of protamine sulfate neutralize the anti-factor IIa activity but result in only partial neutralization of the anti factor Xa activity.

However, studies in experimental animal models indicated that increased microvascular bleeding produced by very high concentrations of Enoxaparin is neutralized by protamine

sulfate. The dose of protamine sulfate is dependent on the dose of heparin used and the time of administration. If protamine is given within 3-4 hours of the Enoxaparin, then a maximal neutralizing dose is: 1 mg of protamine sulfate per 100 units (1 mg) of Enoxaparin given in last dose. The protamine should be administered IV and over a 10 minutes period as rapid infusion can cause hypotension. Consider giving ½ dose of the protamine 6 hours later since the T1/2 of lovenox is longer than protamine.

Protamine sulfate should only be given after consultation with hematology.

Nomogram for Enoxaparin Treatment:

Adjust the dose of Enoxaparin according to the following nomogram. Depending on the anti factor Xa level achieved, successive actions are indicated, including whether to hold the next scheduled dose and whether any dose change is indicated and when the next anti factor Xa level should be drawn.

Anti Factor Xa level	Hold Next Dose?	Dose Change?	Repeat Anti Factor Xa level?
< 0.35 u/ml	No	increase by 25%	4 hours post next dose
0.35 to 0.69 u/ml	No	increase by 15%	4 hours post next dose
0.7 to 1.1 u/ml	No	0	1 x per week at 4 hours post dose
1.1 to 1.5 u/ml	No	decrease by 20%	4 hours post next dose
1.6 to 2.0 u/ml	No	decrease by 30%	4 hours post next dose
> 2.0 u/ml	For these patients, all further doses should be held, and the anti factor Xa level measured q 12 hours until the anti factor Xa level is less than 0.5 u/ml. Enoxaparin can then be restarted at a dose 40% less than was originally prescribed.		

The above nomogram assumes that there is no bleeding. **If any bleeding occurs, contact hematology STAT.**

Accumulation of Enoxaparin

There is some evidence that Enoxaparin may accumulate in the body over time and therefore adjust dosing requirements. For patients on long term therapy (greater than 4 weeks), this possibility should be assessed.

Cost (AWP)/Syringe (Cost of 7 days of therapy):

40 mg: \$28.60
 60 mg: \$42.73 (\$598.22)
 80 mg: \$56.98 (\$797.72)
 100 mg: \$71.21 (\$996.94)
 120 mg: \$85.49 (\$1,196.86)
 150 mg: \$105.86 (\$1,482.04)