Enoxaparin Dosing Guidance

Reference no.: CG-CLIN/4286/24

1. Introduction

Enoxaparin sodium is the LMWH of choice at UHDB. This guideline is intended to advise on its use for prophylaxis and therapeutic anticoagulation treatment in VTE.

VTE is the leading cause of preventable death in hospital. A DVT is categorised as a blood clot within a major vein in the leg causing swelling and pain from impaired blood flow. Thrombus formation in distal veins can lead to the development of a PE.

Roughly 51% of DVT's will result in a PE. It is especially important to prescribe thromboprophylaxis for eligible patients to reduce the risk of VTE formation and this should be done as soon as possible or prior to first consultant review.

2. Definitions, Keywords

CAT- Cancer Associated Thrombosis

CrCl – Creatinine Clearance (ml/min)

DVT- Deep Vein Thrombosis

eGFR – Estimated Glomerular Filtration Rate

HIT- Heparin Induced Thrombocytopenia

LMWH- Low Molecular Weight Heparin

PE – Pulmonary embolism

SPC – Summary of Product Characteristics

SVT- Superficial Venous Thrombophlebitis

VTE- Venous thromboembolism

3. Relevant Indications

- VTE prophylaxis for medical and surgical patients

- VTE prophylaxis in pregnancy and the puerperium (off label but established practice)
- Treatment of confirmed or suspected DVT and PE, excluding PE likely to require thrombolytic therapy or surgery
- Treatment of extensive superficial venous thrombosis (SVT) (off label but established practice)
- Adjunct therapy for high-risk anti-vitamin K anticoagulated patients with subtherapeutic INRs

Always check recorded patient weight, and calculated CREATININE CLEARANCE* before prescribing, eGFR can be used for patients with normal body muscle mass or aged under 75

$$\text{Estimated CrCl (mL/min)} = \frac{(140 - \text{Age in years}) \times \text{Weight in kg} \times \text{Constant}}{\text{Serum Creatinine (mmol/L)}}$$

(Constant is 1.23 for men, 1.04 for women)

Enoxaparin should be administered at the same time daily. Where a patient is admitted during the day, administration time for prophylaxis will be for 6pm. For overnight admissions, enoxaparin is to be prescribed for the morning.

Platelet count should be measured prior to LMWH administration as heparin use can lead to HIT. HIT should be considered if a 30% reduction in platelet count, skin allergy or thrombosis occur within 4-14 days of treatment initiation.

See: Trust Policy For Venous Thrombo-embolism (VTE) Risk Assessment and Thromboprophylaxis on Koha for more information.

Thromboprophylaxis chart for medical and surgical patients

Body weight	**Enoxaparin dose**	
<50 Kg	20 mg OD	
50-100 Kg	40 mg OD	
101-150 Kg	60 mg OD*	40mg BD*
>150 Kg	80 mg OD*	60mg BD*
Renal Function		
Creatinine Clearance < 30 ml/min	20 mg OD	
Creatinine Clearance < 15 ml/min Haemodialysis patients	20 mg OD short-term; *discuss with renal about long-term*	

*The choice of once or twice daily doses in higher weighted patients is dependent on clinical need. Clinicians are advised to use professional judgement, for example, post-operative surgical patients would benefit from OD dosing to reduce bleeding risk, whilst BD dosing would suit the more complex medical patients.

Thromboprophylaxis chart for pregnancy and post-partum

Body weight	**Enoxaparin dose**
<50 Kg	20 mg OD
50-90 Kg	40 mg OD
91-130 Kg	60 mg OD
131-170 Kg	80 mg OD
>170 Kg	0.6 mg/Kg *Discuss with Thrombosis Consultant; Split calculated dose to give it twice daily, round dose to the nearest syringe*

See: Thromboprophylaxis during and up to 6 weeks after Pregnancy-Clinical Guidelines on Koha for more information in this cohort.

Treating SVT

SVT is to be treated as VTE (see below) in those within 3cm of the safeno-femoral (SFJ) or safeno-popliteal junction (SPJ).

Prophylactic dose enoxaparin should be used for SVT greater than 5cm in length and more than 3cm from the deep vein junction.

Prescribing therapeutic dose enoxaparin for VTE

The usual treatment dose is 1.5 mg/Kg once daily (see dose banding below).

Where calculated CrCl is < 30 ml/min, use 1mg/kg once daily with factor anti-Xa monitoring (3-4 hours after the third dose).

In the case of dialysis dependent renal failure, use 50% of the intended dose once daily rounded to the nearest syringe with factor anti-Xa monitoring (3-4 hours after at least 3 doses).

When to prescribe enoxaparin 1 mg/Kg twice daily:

There is no strong clinical evidence that once daily is inferior to twice daily enoxaparin [1, 2]. Twice daily enoxaparin injections are uncomfortable for the patient and costly.

Twice daily enoxaparin is usually prescribed in 'high risk patients':

- Acute VTE with large clot burden -e.g., massive PE, iliac vein thrombosis. Discuss with a senior clinician if unsure
- Acute VTE on therapeutic anticoagulation for previous VTE with no evidence of subtherapeutic use- Discuss with a senior clinician if unsure
- Cancer-associated thrombosis- Careful consideration should be given to the risk of thrombosis versus the risk of bleeding in patients with cancer. In the majority of cases, these patients can receive 1.5mg/kg once daily. However, 1mg/kg twice daily should be used for cancer patients with a high clot burden, failure on treatment dose anticoagulation, or for those with additional risk factors such as obesity and previous history of VTE [3]
- Patients with a mitral mechanical valve on warfarin, or mechanical heart valve on warfarin with target INR 2.5-3.5 or 3-4, when INR<2.0 (unlicensed use)

Patients who are discharged on twice daily treatment should continue this in primary care until they are reviewed in clinic, where they may be stepped down to once daily treatment, if appropriate.

Note, twice daily enoxaparin is the preferred option for antenatal VTE events, USE BOOKING WEIGHT to calculate the dose. See Thromboembolism in Pregnancy and the Puerperium- Acute Management on Koha for further information.

VTE treatment dosing chart

Standard VTE dose		**High risk patients** (see guidance above)	
1.5 mg/Kg **ONCE** daily		1 mg/Kg **TWICE** daily	
Weight	*Dose*	*Weight*	*Dose*
25-34 Kg	40 mg od	<50kg	40mg twice a day
35-46 Kg	60 mg od	50 – 69kg	60mg twice a day
47-59 Kg	80 mg od	70 – 89kg	80mg twice a day
60-73 Kg	100 mg od	90 – 109kg	100mg twice a day
74-86 Kg	120 mg od	110 – 125kg	120mg twice a day
87-96 Kg	140 mg od		
97-103 Kg	150 mg od		
104-113 Kg	160 mg od		
114-126 Kg	180 mg od		
>126 Kg, BMI<40	1mg/kg twice daily, rounded to the nearest syringe.		
>126 Kg, BMI>40	1.5 mg/kg daily dose split to be given TWICE daily, rounded to the nearest syringe **with factor anti-Xa monitoring** [4, 5].		

4. References

1. van Dongen CJ, Mac Gillavry MR, Prins MH. Once versus twice daily LMWH for the initial treatment of venous thromboembolism. Cochrane Database Syst Rev. 2003;(1):CD003074. doi: 10.1002/14651858.CD003074. Update in: Cochrane Database Syst Rev. 2005;(3):CD003074. PMID: 12535452.

2. Trujillo-Santos J, Bergmann JF, Bortoluzzi C, Lopez-Reyes R, Giorgi-Pierfranceschi M, Lopez-Saez JB, Ferrazzi P, Bascunana J, Surinach JM, Monreal M. Once versus twice daily enoxaparin for the initial treatment of acute venous thromboembolism. J Thromb Haemost 2017; 15: 429–38.

3. Diaz AH, Rodgers GM, Gilreath JA. Enoxaparin once daily vs. twice daily dosing for the treatment of venous thromboembolism in cancer patients: a literature summary. J Oncol Pharm Pract. 2012 Jun;18(2):264-70. doi: 10.1177/1078155211412990. Epub 2011 Sep 19. PMID: 21930652.

4. Lalama JT, Feeney ME, Vandiver JW, Beavers KD, Walter LN, McClintic JR. Assessing an enoxaparin dosing protocol in morbidly obese patients. J Thromb Thrombolysis. 2015;39(4):516-521. doi:10.1007/s11239-014-1117-y

5. Lee, Y.R., Vega, J.A., Duong, H.-N.Q. and Ballew, A. (2015), Monitoring Enoxaparin with Antifactor Xa Levels in Obese Patients. Pharmacotherapy, 35: 1007-1015. https://doi.org/10.1002/phar.1658

6. *Venous thromboembolism (VTE) prophylaxis* (no date) *Venous thromboembolism (VTE) prophylaxis - Symptoms, diagnosis and treatment | BMJ Best Practice*. Available at: https://bestpractice.bmj.com/topics/en-gb/1087 (Accessed: 11 July 2023).

7. Documentation Controls

Reference Number CG-CLIN/4286/24	**Version:** 1.0.1		**Status** Final	Dr Kartsios, A Hussain
Version / Amendment History	Version	Date	Author	Reason
	1.0.0	April 2024		New guideline
Intended Recipients: All clinical staff groups				
Training and Dissemination: -				
Development of Guideline: Dr Charalampos Kartsios, Ayla Hussain **Job Title:** Consultant Haematologist, Lead Pharmacist Thrombosis Group				
Consultation with: Thrombosis Group, Haematology Consultants				
Linked Documents: Thromboprophylaxis during and up to 6 weeks after Pregnancy-Clinical Guidelines, Thromboembolism in Pregnancy and the Puerperium- Acute Management				
Keywords: Enoxaparin, DVT, Inhixa, Clexane, LMWH, Pregnancy				
Business Unit Sign Off			**Group:DTC** **Date:20th February 2024**	
Divisional Sign Off			**Group:Trustwide CGG** **Date:PENDING**	
Date of Upload			04/04/2024	
Review Date			April 2027	
Contact for Review			Dr Charalampos Kartsios, Ayla Hussain	