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Replaces: Version 6.1, Shared Care Guideline - Enoxaparin, SCG/007	**Head of Department:** Kam Mom, Trust Chief Pharmacist and Accountable Officer for Controlled Drugs
Does this document refer to and account for the prescribing, supply, storage or administration of medication (especially via electronic media)? **Yes** **If yes, Pharmacy Dept. must be consulted and provide approval date below.**	
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- Does this document meet the requirements under the Equality Act 2010 in relation to age, disability, gender reassignment, marriage and civil partnership, pregnancy and maternity, race, religion or belief, sex, and sexual orientation? **Yes**
- Does this document meet our additional commitment as a Trust to extend our public sector duty to carers, veterans, people from a low socioeconomic background, and people with diverse gender identities? **Yes**

Document for Public Display: No

SHARED CARE GUIDELINE

Drug: LOW MOLECULAR WEIGHT HEPARIN (LMWH) ENOXAPARIN

Introduction

Enoxaparin is one of several available low-molecular weight heparins (LMWHs) administered by subcutaneous injection. LMWHs are now widely used for a number of licensed and off-license indications including the prophylaxis and treatment of thromboembolic events, including Deep Vein Thrombosis (DVT) and Pulmonary Embolism (PE). In this shared care guideline, the term Venous Thrombo-Embolism (VTE) covers both DVT and PE.

Indication: The following approved uses of enoxaparin are suitable for shared care between the specialist and the patient's GP:

- Extended treatment of VTE and prevention of its recurrence in patients with active cancer
- Treatment of VTE or suspected VTE in patients unable to stabilise on warfarin or direct-acting oral anti-coagulants (DOACs) or with a contraindication to warfarin or DOACs.
- Prophylaxis of DVT or PE when unable to stabilise on warfarin or DOACs, with an allergy or contraindication to warfarin and/or DOACs
- Extended prophylaxis for patients at high risk of DVT or PE due to suspected or confirmed COVID-19 infection
- Extended prophylaxis of high-risk patients in the primary care setting, e.g., immobile patients or those deemed to be at particularly high-risk of DVT at home or in a care situation and who are unable to tolerate/take warfarin or DOACs.
- All other indications not included in the RED list below.

The following indications are agreed RED (**full supply from hospital**):

- Prophylaxis of VTE in oncology patients on VTE-inducing therapy **
- Treatment of VTE in pregnancy (pre- and post-partum)
- Prophylaxis of VTE in pregnancy (high-risk patients pre- and post-partum)
- Prophylaxis of VTE post-operatively, e.g., hips, knees, general surgery
- Post-operative use in all surgical specialties, in conjunction with warfarin whilst waiting for the INR to come into range
- Pre-operative use as a replacement for warfarin in high-risk patients, i.e., 'Bridging Therapy.' (Primary care to prescribe if, due to unforeseen circumstances, patients require additional doses)
- Prophylaxis of VTE in patients with a lower limb plaster cast

** VTE-inducing therapy refers to systemic anti-cancer therapy (SACT) regimens which include thalidomide, lenalidomide or pomalidomide. In these cases, enoxaparin is supplied by the hospital as part of the SACT regimen. In addition, some patients on SACT, who were previously on an anticoagulant such as warfarin, will be transferred to a LMWH because of concerns that the SACT will cause erratic and potentially dangerous control. In these cases, enoxaparin would be prescribed and supplied alongside the SACT.

NB: **Travel prophylaxis**: **AMBER**. See Clinical Knowledge Summaries for further information: National Institute for Clinical Excellence (NICE) 2018 'DVT prevention for travellers' [Online] Available from: https://cks.nice.org.uk/topics/dvt-prevention-for-travellers/ (accessed 13/09/2023) and consult a haematologist for advice

Dose &

Enoxaparin is available in boxes of 10 as:

Administration

- 20mg, 40mg, 60mg, 80mg and100mg pre-filled syringes containing 100mg/mL enoxaparin
- 120mg and 150mg pre-filled syringes containing 150mg/mL enoxaparin

TREATMENT of DVT

Enoxaparin can be administered subcutaneously (SC) either as a **ONCE DAILY** injection of 1.5mg/kg (150units/kg) or as **TWICE DAILY** injections of 1mg/kg (100units/kg). The regimen should be selected by the secondary care physician based on an individual assessment including evaluation of the thromboembolic risk and of the risk of bleeding. The dose regimen of 1.5mg/kg administered once daily should be used in uncomplicated patients with low risk of VTE recurrence.

The dose regimen of 1mg/kg administered twice daily should be used in all other patients such as those with obesity, with symptomatic PE, cancer, recurrent VTE or proximal (*vena iliaca*) thrombosis.
NICE Clinical Guideline (CG) 189 classifies obesity as a body mass index measurement (BMI) greater than 30.

For treatment of VTE (uncomplicated) dose banding has been agreed as follows:

Enoxaparin 1.5mg/kg subcutaneously once daily	
Weight (kg)	**Dose**
40 - 46	60mg once daily
47 - 59	80mg once daily
60 - 74	100mg once daily
75 - 89	120mg once daily
90 - 110	150mg once daily
111 - 130	180mg once daily (80mg plus 100mg)
In renal impairment (GFR <30ml/min) give 1mg/kg once daily	

For treatment of complicated VTE, dose banding has been agreed as follows:

Enoxaparin 1mg/kg subcutaneously twice daily	
Weight (kg)	**Dose**
35 - 44	40mg twice daily
45 - 64	60mg twice daily
65 - 84	80mg twice daily
85 - 104	100mg twice daily
105 - 124	120mg twice daily
125 +	150mg twice daily
In renal impairment (GFR <30ml/min) give 1mg/kg **once** daily	

PROPHYLAXIS of DVT

The dose of enoxaparin should be amended in accordance with the patient's weight. The suggested doses of enoxaparin for thromboprophylaxis in non-pregnant adults are:

Weight	**<50kg**	**50 - 100kg**	**100 - 150kg**	**> 150kg**
Enoxaparin	20mg daily	40mg daily	40mg twice daily	60mg twice daily

Dosage should be reduced to 20mg (2,000units) SC once daily in patients with severe renal impairment (creatinine clearance 15 – 30 ml/min)

PROPHYLAXIS of DVT/PE in COVID-19 patients

This table represents the prophylactic enoxaparin guidance that is recommended in suspected or confirmed COVID-19 patients at UHMBT.

Patient Weight	Renal Function	Enoxaparin
35-59kg	CrCl >30ml/min	40mg S/C ONCE DAILY
	CrCl <30ml/min	20mg S/C ONCE DAILY
60-120kg	CrCl >30ml/min	40mg S/C TWICE DAILY
	CrCl <30ml/min	40mg S/C ONCE DAILY
>120kg		Consider higher dosing on discussion with haematology

The continued need for enoxaparin must be reviewed regularly based on the patient's clinical response and the review of the clinical picture will dictate the duration of treatment. On discharge, the duration of treatment must be clearly documented if it is to be continued post discharge.

Secondary Care Responsibilities

1. Confirm the diagnosis of VTE or the indication for extended prophylaxis.
2. Perform baseline blood tests: full blood count, renal function tests
3. Discuss the benefits and side effects of treatment with the patient.
4. Provide training on self-administration of enoxaparin if appropriate.
5. Provide sufficient enoxaparin for 10 days and a 1litre sharps bin.
6. Arrange for the patient to have a full blood count (FBC) at the specified times during the first 14 days of treatment (see Monitoring below) to rule out heparin-induced thrombocytopenia (HIT). Ensure that the patient knows when and where to attend for blood tests and ensure that the General Practitioner (GP) is informed of the baseline and subsequent platelet counts.
7. Arrange shared care with the patient's GP.
8. Advise the GP on:

- the indication for which enoxaparin is being used
- the treatment to be prescribed including dose, frequency, and expected duration
- baseline bloods: full blood count and platelets
- the patient's weight and initial renal function, including potassium level
- any monitoring that is required. It is vital that the frequency of any required monitoring (platelets, renal function) is clearly communicated to the patient's GP.
- when to stop treatment

9. Review the patient as necessary.
10. Ensure that clear backup arrangements exist for GPs to obtain advice.

Primary Care Responsibilities

1. Provide the patient with prescriptions for enoxaparin and a 1 litre sharps bin for the duration of treatment.
2. Ensure systems are in place for daily or twice-daily administration of enoxaparin if the patient is not self-administering.
3. Check that the dose is appropriate for the patient's weight and renal function.

	4. Arrange to carry out any monitoring that is advised by the consultant. 5. Report any adverse effects to the consultant.

Monitoring	Heparin induced thrombocytopenia (HIT) is a rare side effect of heparin including LMWH. Thrombocytopenia, should it occur, usually appears between days 5 and 21 of treatment. • All patients should have a platelet count before starting treatment. • For patients who have been exposed to heparin of any sort in the last 100 days a platelet count 24 hours after starting enoxaparin should be obtained. • All patients should have a platelet count on days 7 and 14 post initiation and regularly thereafter. If a significant decrease in the platelet count is observed (greater than 30% drop from the initial value) then enoxaparin must be discontinued immediately. Heparin can suppress adrenal secretion of aldosterone leading to hyperkalaemia. Potassium should be monitored before and during treatment in patients at risk e.g., patients with chronic renal failure, diabetes mellitus, patients with pre-existing metabolic acidosis and patients taking potassium sparing drugs. The referring consultant will specify if and with what frequency potassium should be monitored. Routine anti-Xa activity monitoring is not usually required but may be considered in patients at risk of under or over anticoagulation, e.g., in those with renal or hepatic impairment or at extremes of bodyweight. The referring consultant will specify if and with what frequency anti-Xa should be monitored.
Adverse Effects	• Bleeding may occur in the presence of associated risk factors e.g., lesions liable to bleed, invasive procedures or the use of medicines affecting haemostasis. Rarely, major haemorrhage. • Mild, transient, asymptomatic thrombocytopenia during the first few days of therapy. Rarely HIT (see MONITORING above). • Injection site reactions, usually mild and should not cause discontinuation of therapy. Seek advice if severe. • Long-term treatment with heparin (greater than 3 months) increases the risk of osteoporosis.
Drug Interactions	Drugs affecting haemostasis It is recommended that some agents which affect haemostasis should be discontinued prior to enoxaparin therapy unless strictly indicated. If the combination is indicated, enoxaparin should be used with careful clinical and laboratory monitoring when appropriate. These agents include medicinal products such as: • Systemic salicylates, aspirin (anti-inflammatory doses), and NSAIDs including ketorolac • Other thrombolytics (e.g., alteplase, streptokinase, tenecteplase, urokinase) and anticoagulants The following medicinal products may be administered with caution concomitantly with enoxaparin: • Platelet aggregation inhibitors including aspirin used at antiaggregant dose (cardioprotection), clopidogrel, ticlopidine, and glycoprotein IIb/IIIa antagonists indicated in acute coronary syndrome due to the risk of bleeding • systemic glucocorticoids • Dextran 40 Medicinal products that increase serum potassium levels may be administered concurrently with enoxaparin under careful clinical and laboratory monitoring.

Contra-indications	• Hypersensitivity to enoxaparin sodium, heparin, or its derivatives, including other low molecular weight heparins (LMWH) or to any of the excipients. • History of immune mediated heparin-induced thrombocytopenia (HIT) within the past 100 days or in the presence of circulating antibodies • Active clinically significant bleeding and conditions with an elevated risk of haemorrhage, including recent haemorrhagic stroke, gastrointestinal ulcer, presence of malignant neoplasm at substantial risk of bleeding, recent brain, spinal or ophthalmic surgery, known or suspected oesophageal varices, arteriovenous malformations, vascular aneurysms or major intraspinal or intracerebral abnormalities. • Acute bacterial endocarditis. • Enoxaparin is not recommended in pregnant women with prosthetic heart valves. • Spinal or epidural anaesthesia/analgesia or lumbar puncture is not recommended within 12 hours of prophylactic doses or within 24 hours of treatment doses of enoxaparin.
This guidance does not replace the SPC's, which should be read in conjunction with this guidance.	