SHARED CARE GUIDELINE

Drug: Low Molecular Weight Heparins (LMWH)

Agreed by Chorley and South Ribble and Greater Preston CCG and Lancashire Teaching Hospitals NHS Foundation Trust.

Introduction	**Indications included in the shared care guideline**: • Treatment of DVT or PE and prevention of its recurrence in patients unable to stabilise on warfarin or DOACs or with a contraindication to warfarin or DOACs **(Including treatment post-partum).** • Treatment of DVT or PE and prevention of its recurrence in patients with malignant disease (solid tumours). • Prophylaxis of DVT in immobile patients at home or in care setting and at high risk of developing a DVT • Treatment of DVT or PE in housebound patients in whom treatment has been initiated in hospital or in the Primary Care Centre until warfarin treatment stabilised or scan proves negative **Indications NOT included in shared care guideline:** **Red Indications** • Prophylaxis of VTE in oncology patients on VTE inducing therapy • Pregnancy: Prevention of VTE (High risk patients – pre and postpartum) / prevention of miscarriage / use in fertility clinics • Pregnancy: Treatment of VTE **pre-partum**. • VTE prophylaxis – post operative use • Pre-operative & post-operative surgical use **Background:** LMWHs are considered to be safer than warfarin and other oral anticoagulants for the treatment and prophylaxis of VTE in certain groups of patients including; Cancer patients with active disease and/or receiving chemotherapy Pregnant patients (only for women who have a VTE , have had a previous VTE or who have thrombophilia Intravenous drug users Patients with liver disease especially if prothrombin time is prolonged.
Dose & Administration	See Dose charts in Appendix 1.
Secondary Care Responsibilities	**Secondary Care Responsibilities are:** 1. Confirm the diagnosis of VTE or the indication for prophylaxis 2. Discuss the benefits and side-effects of treatment with the patient 3. Provide training on self-administration if appropriate 4. Provide sufficient initial supply (1 month) and a sharps bin were appropriate 5. Arrange for the patient to have an FBC at specified times during the first 14 days of treatment to rule out thrombocytopenia. Ensure that the patient knows when and where to attend for blood tests and ensure that the GP is informed of the baseline platelet count. 6. Agree shared care with the patients GP 7. Provide GP all relevant information as outlined including: The treatment to be prescribed including dose, frequency, indication and expected duration The patient's weight and initial renal function Details of monitoring required When to stop treatment 8. Review the patient regularly 9. Ensure that clear referral and GP advice.
Primary Care Responsibilities	**Primary Care Responsibilities are:** 1. Provide the patient with prescriptions for prescribed LMWH and a sharps bin for the duration of the treatment 2. Ensure systems are in place for administration if the patient is not self-administering 3. Check dose is appropriate for patient's weight and renal function 4. Arrange or carry out any monitoring required 5. Report any adverse events to the consultant

Monitoring Required in Primary Care	As detailed in Appendix 3

Drug Interactions (as listed in the BNF)	See BNF or SPC for full information Drugs affecting haemostasis e.g. antiplatelets, NSAIDs, systemic glucocorticoids, thrombolytics and anticoagulants. If the combination cannot be avoided use the LMWH carefully with appropriate monitoring.
Contraindications	Active major bleeding and conditions with a high risk of uncontrolled haemorrhage, including recent haemorrhagic stroke, thrombocytopenia in patients with a positive in- vitro aggregation test in the presence of enoxaparin, active gastric or duodenal ulceration and severe liver disease. Acute bacterial endocarditis Epidural anaesthesia/analgesia is not recommended within 12 hours of prophylactic doses or within 24 hours of treatment doses.
Contact Details	
This guidance does not replace the SPCs, which should be read in conjunction with this guidance.	

Appendix 1 – Dosing

Enoxaparin (Clexane ®) Dosing Chart

Low molecular weight heparin formulary choice for the treatment of DVT/PE in non- oncology patients. (for oncology patients see appendix 5). Dose is a once daily sub-cutaneous injection.

Enoxaparin (If eGFR less than 30mls/min, reduce dose as per SPC)					
Indication	**Weight (Kg)***	**Dose (mg & Units) Frequency** Dose = 1.5mg/kg (150units/kg) every 24hr		**Each Dose Supplied As** **Volume**	**Syringe used**
Treatment of VTE Licensed Indication	35-40	60 mg	Once Daily	0.6ml	orange
	41-46	70 mg	Once Daily	0.7ml	brown
	47-53	80 mg	Once Daily	0.8ml	brown
	54-60	90 mg	Once Daily	0.9ml	black
	61-66	100 mg	Once Daily	1ml	black
	67-70	105 mg	Once Daily	0.7ml	mauve
	71-80	120 mg	Once Daily	0.8ml	mauve
	81-90	135 mg	Once Daily	0.9ml	blue
	91-100	150 mg	Once Daily	1ml	blue
	101-106	160 mg	Once Daily	1ml + 0.6ml	black & orange
	107-113	170 mg	Once Daily	1ml + 0.7ml	black & brown
	114-120	180 mg	Once Daily	1ml + 0.8ml	black & brown
	121-126	190 mg	Once Daily	1ml + 0.9ml	black x 2
	127-133	200 mg	Once Daily	1ml + 1ml	black x 2
	134-136	205 mg	Once Daily	1ml + 0.7ml	black & mauve
	137-146	220 mg	Once Daily	1ml + 0.8ml	black & mauve

Dalteparin (Fragmin ®) Dosing Chart

Dalteparin Maximum single daily dose= 18 000 units regardless of body weight (If CrCl<20ml/min, adjust dose based on anti-Factor Xa activity as per SPC)					
Indication	**Weight (Kg)**	**Dose (Units) & Frequency** **If CrCL <20 ml/min**: Adjust dose based on anti-Factor Xa activity.		**Each Dose Supplied As** **Volume**	**Syringe used**
Treatment of VTE Licensed Indication	<46kg	7500 units	Once Daily	0.3ml	0.3ml syringe (25000 units/ml)
	46-56kg	10000 units	Once Daily	0.4ml	0.4ml syringe (25000 units/ml)
	57-68kg	12500 units	Once Daily	0.5ml	0.5ml syringe (25000 units/ml)
	69-82kg	15000 units	Once Daily	0.6ml	0.6ml syringe (25000 units/ml)
	Over 83kg	18000 units	Once Daily	0.72ml	0.72ml syringe (25000 units/ml)

Extended treatment & prophylaxis of VTE in patients with solid tumours Licensed Indication	**First 30 days' treatment:** 200units/Kg daily (max dose 18 000units) or as per dose bands below. (For patient at increased risk of haemorrhage the dose can be divided into two i.e. 100 units/kg twice daily)				
	Weight (Kg)	**Dose (Units) & Frequency** See below for dose adjustments in chemotherapy- induced thrombocytopenia.		**Each Dose Supplied As** **Volume**	**Syringe used**
	40-45kg	7500 units	Once Daily	0.3ml	0.3ml syringe (25000 units/ml)
	46-56kg	10000 units	Once Daily	0.4ml	0.4ml syringe (25000 units/ml)
	57-68kg	12500 units	Once Daily	0.5ml	0.5ml syringe (25000 units/ml)
	69-82kg	15000 units	Once Daily	0.6ml	0.6ml syringe (25000 units/ml)
	Over 82kg	18000 units	Once Daily	0.72ml	0.72ml syringe (25000 units/ml)
	Then for a further 5 months dose: 150units/Kg daily or as per dose bands below.				
	40-56kg	7500 units	Once Daily	0.3ml	0.3ml syringe (25000 units/ml)
	57-68kg	10000 units	Once Daily	0.4ml	0.4ml syringe (25000 units/ml)
	69-82kg	12500 units	Once Daily	0.5ml	0.5ml syringe (25000 units/ml)
	83-98kg	15000 units	Once Daily	0.6ml	0.6ml syringe (25000 units/ml)
	99 kg and over	18000 units	Once Daily	0.72ml	0.72ml syringe (25000 units/ml)
	In the case of chemotherapy-induced thrombocytopenia: Dose should be adopted as follows: **Platelet <50,000/mm^3 (or 50x10^{9}L):** Refer back to the specialist initiating treatment & hold treatment until the platelets recover. **Platelet = 50,000 - 100,000/mm^3 (or 50-100 x10^{9}L):** Refer back to the specialist initiating treatment. Dose should be reduced depending on the patient's weight.				

Body Weight (kg)	**Scheduled Dose**		**Reduced Dose**	
≤56kg	7500 units	Once Daily	5000 units	Once Daily
57-68kg	10000 units	Once Daily	7500 units	Once Daily
69-82kg	12500 units	Once Daily	10000 units	Once Daily
83-98kg	15000 units	Once Daily	12500 units	Once Daily
≥99kg	18000 units	Once Daily	15000 units	Once Daily

Once the platelet count has recovered to ≥100,000/mm^3 (or ≥100x10^{9}L): treatment can be re-started at full dose.

Prophylaxis of VTE	**5000 units once a day/**

Appendix 2 - Monitoring

<table>
<tr><th>Parameter</th><th>Monitoring Requirements. [1-4,6]</th></tr>
<tr><td>Full Blood Count (Platelets)</td><td>Check at baseline, and at 7 and 14 days after treatment starts and then every 3 months or more frequently if clinically indicated.

Heparin induced thrombocytopenia (HIT) is a rare side effect of LMWHs, it usually but not always happens within the first 14 days of treatment.
Signs of HIT include a reduction in platelet count of 30% or more, thrombosis & skin allergy[6].
If HIT is confirmed/strongly suspected, stop treatment and discuss with haematologist/responsible secondary care clinician (within 24hrs).</td></tr>
<tr><td>U&Es Renal Function & Potassium</td><td>Renal function and potassium levels should be checked on initiation then a minimum of every 3 months, dependent on the patient’s risk of either deterioration of renal function or hyperkalaemia.

LMWHs are renally excreted, if creatinine clearance is 30-50ml/min check renal function more frequently, as clinically indicated. Dose adjustment may be required in renal impairment as per the SPC, see below for a summary of manufacturers’ recommendations.
<table>
<tr><th>LMWH</th><th>Manufacturers’ recommendations in renal impairment (RI)
Adapted from UKMI. Q&A 238.3[8]</th></tr>
<tr><td>Dalteparin</td><td>Monitoring of anti-factor Xa levels should be considered in RI. Use with caution in patients with RI who have an increased risk of bleeding complications.
Patients with significant renal failure i.e. CrCl <30 ml/min, may need a reduction in dose and should be monitored accordingly. In patients with CrCl<20ml/min, the dose should be adjusted based on anti-Factor Xa activity[1].
For patients with an increased risk of bleeding, it is recommended that dalteparin is administered according to the twice daily regimen. (See SPC for more details).</td></tr>
<tr><td>Enoxaparin</td><td>A dose reduction is advised in patients with severe RI (CrCl <30ml/min). No dosage adjustments are recommended in patients with a CrCl >30ml/min, but careful clinical monitoring is advised. Monitoring of anti-factor Xa levels should be considered in patients with RI.</td></tr>
</table>
LMWHs can inhibit aldosterone secretion, resulting in hyperkalaemia. Patients with diabetes mellitus, chronic renal failure, acidosis, raised plasma potassium or taking potassium-sparing drugs are more susceptible. The risk appears to increase with duration of treatment</td></tr>
<tr><td>Anti-factor Xa</td><td>Anti-factor Xa is a surrogate marker of anticoagulant effect. Routine monitoring is not recommended, however it may be of benefit in certain patient groups, such as pregnancy[7] and patients at increased risk of bleeding, e.g. patients who are very over or underweight and patients with renal dysfunction[6].

When Anti-factor Xa monitoring is required, local haematology departments should be consulted to advise on monitoring requirements, and the most suitable target range for anti-factor Xa activity due to variations in laboratory techniques[9]. For this reason, it is expected that LMWH prescribing for this patient group will usually be retained by secondary care.</td></tr>
</table>

Weight	Patients should be weighed on initiation and then periodically throughout treatment as appropriate. Use of LMWHs for prophylaxis or treatment in patients who are very over or underweight can pose a clinical challenge and may justify the off-label use of LMWHs, or adjustments in dosing regimens[9]. This decision should only be made following specialist advice and careful consideration of risks introduced by changing standard practice. Monitoring anti-factor Xa is key to the safe use of LMWHs in patients who receive an altered dosage regimen.[9] See UKMI Q&A 414.1 for more information on prescribing LMWH in overweight patients. N.B. The SPC for enoxaparin does not make a recommendation on dose-capping in overweight patients but the SPC for dalteparin states that VTE treatment doses should be no higher than 18 000 units regardless of body weight.

Appendix 3: Shared Care Agreement

Request by Specialist Clinician for Primary Care Clinician to enter into a shared care agreement for Low Molecular Weight Heparin

Please complete the form and send to the patient's GP

Part 1 - to be signed by Consultant

Date _____

Name of patient _____

Address_____

Patient NHS No _____

Patient hospital unit No _____

Diagnosed condition _____

If using addressograph label please attach one to each copy

Dear Dr_____

I request that you prescribe

(1)_____

for the above patient in accordance with the enclosed shared care framework.

I confirm that the patient has been stabilised and reviewed on the above regime as per the Shared Care Framework and Policy.

Details of Specialist Clinicians

Name_____ Date_____

Consultant Name _____

Signature _____

Contact details: _____

Part 2 – Monitoring

Monitoring requirements are detailed in Appendix 2 attached.
This section must be completed with all available results – see table.

Monitoring up to **14 days** is the responsibility of secondary care. If the patient is discharged before this date arrangements must be made for the patients to have their platelets checked and reviewed prior to the GP taking over prescribing and monitoring responsibility.

Test	Platelet Count	Renal Function (eGFR)	Potassium	Weight (Kg)
Baseline Date				
7 Days Date		n/a	n/a	n/a
14 days Date		n/a	n/a	n/a
3 months Date:				

Part 3 – to be completed by Primary Care Clinician

I agree/do not agree to prescribe _____for the above patient in accordance with the enclosed shared care framework.

GP _____Date _____

GP: Please sign **both copies** and return one copy **within 21 days** to:

GP- If you do not agree to prescribe please provide any supporting information as appropriate below:

_____

_____

Part 4

Other Relevant History