Summary of Thromboprophylaxis in Ambulatory Trauma Patients discharged from the Emergency Department

All patients admitted to NHSL Emergency Departments who have a significant lower limb injury requiring immobilisation must be assessed for their risk of VTE versus the risk of complications from VTE prophylaxis using the approved ED Venous thromboembolism prophylaxis Risk assessment and prescribing guidance.

All patients who do not require VTE prophylaxis should be given the patient information leaflet (PIL) 'Preventing Blood clots during lower limb immobilisation'. The PIL provides information on VTE risk, how to minimise risk and when to seek medical advice if concerned about VTE. This will be given to all patients with lower leg immobilisation regardless of their risk category.

Oral therapy with Rivaroxaban 10mg once daily is first line choice for VTE prophylaxis and Enoxaparin 40mg subcutaneous injection is second line. Please see specific guidance on the ED VTE prophylaxis prescribing decision aid regarding VTE prophylaxis which includes exclusion criteria and dose alterations for weight and renal function.

During presentation at the emergency department patients will be fully educated using the Rivaroxaban Education checklist and they will be supplied with the NHSL Direct Oral Anticoagulant therapy information booklet and Alert Card.

The full quantity of medication will be supplied as TTO packs from the emergency department. If enoxaparin is prescribed a sharps bin and sundries will also be supplied.

By fully managing patients in the emergency department we hope to minimise and prevent multiple healthcare contacts, especially during covid pandemic, and reduce the work load for bloods and further prescriptions onto primary care and improve the patient journey.

Author Dr L Gillan/L McDermott ED UHM **Approved by** ADTC Jan 2021
Review date Jan 2024

NHS Lanarkshire – Emergency Department

Guideline for Thromboprophylaxis in Ambulatory Trauma Patients discharged from the Emergency Department

Author:	**Dr Laura Gillan** **(Consultant Emergency Medicine)**
Co-authors	**Lisa McDermott** **(Senior Clinical Pharmacist)**
Endorsing Body:	**ADTC**
Governance or Assurance Committee	**ADTC**
Implementation Date:	**January 2021**
Version Number:	**Final**
Review Date:	**January 2024**
Responsible Person	**Dr Laura Gillan**

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CONSULTATION AND DISTRIBUTION RECORD	
Contributing Author / Authors	• Dr Laura Gillan •
Consultation Process / Stakeholders:	• Mr David Murray • • •
Distribution:	• All consultants and junior medical staff in Emergency Medicine in NHSL • All Trauma & Orthopaedic Consultants and junior medical staff in NHSL • All Advanced care practitioners and Minor Injury Specialist nurses in NHSL

CHANGE RECORD			
Date	**Author**	**Change**	**Version No.**

1. INTRODUCTION

Orthopaedic care in NHSL has changed significantly with the introduction of virtual fracture clinics. Many patients are not required to attend fracture clinic appointments for Consultant review. Instead they are cared for remotely until near the end of their management plans. To ensure that we manage any risks appropriately and without delay the assessment of VTE risk will need to be performed during a patient's initial consultation in the Emergency Department.

The updated NICE guideline 89 "Venous Thromboembolism in the over 16s: reducing the risk of hospital acquired DVT or PE" has been extended to include "patients discharged from hospital including Accident and Emergency Departments with lower limb devices such as plaster casts or braces"

www.nice.org.uk/guidelines/ng89

This guidance is also reflected in the guidance and quality standards indorsed by the Royal College of Emergency Medicine.

2. AIM, PURPOSE AND OUTCOMES

AIM

The aim of this guideline is to ensure that all patients discharged from the Emergency Departments in NHS Lanarkshire for outpatient management of immobilised lower limb injury are risk assessed and when appropriate, provided with prophylaxis against venous thromboembolism (VTE)**.**

OUTCOMES

All patients with lower limb immobilisation, discharged from the Emergency Department for outpatient management will have their VTE risk and bleeding risk assessed and documented prior to discharge.

All patients with lower limb immobilisation will be provided with a written information leaflet outlining the signs of VTE and the need to seek medical attention.

If pharmacological thromboprophylaxis is indicated this treatment will be initiated from the Emergency Department.

Those prescribed thromboprophylaxis will receive the entire course of their treatment from the Emergency Department. This aims to improve treatment compliance and streamline the patient journey. The will receive verbal and written advice on any complications of their treatment and the need to seek medical attention.

3. SCOPE

3.1 Who is the Policy intended to Benefit or Affect?

This guidance is for patients aged 18 years of age and over who are discharged from the Emergency Departments in NHS Lanarkshire for outpatient management of an immobilised lower limb injury.

It is not intended for those who are admitted for inpatient management or those who are discharged for next day operative management.

3.2 Who are the Stakeholders

The stakeholders are the medical, advanced clinical practitioners, nursing and pharmacy staff caring for patients in the Emergency Departments of NHSL.

Additional stakeholders are the NHSL Trauma and Orthopaedic Consultants responsible for the outpatient care of these patients.

4. PRINCIPAL CONTENT

4.1 Risk Assessment

A VTE is a potentially fatal condition which can occur sporadically in the general population. It is recognised that the risk of VTE is increased in certain conditions and situations:

- Prolonged recumbency (>48 hours admission)
- Prolonged lower limb immobilisation
- Lower limb or pelvic trauma
- Obesity
- Pregnancy or <6 weeks post-partum
- Age >60 years
- Use of hormone replacement therapy or oestrogen containing oral contraceptive
- Hypercoagulable states – e.g. malignancy, sepsis, dehydration, smoking
- Congenital predisposition – e.g. factor V Leiden, protein C and S deficiencies

In the emergency department lower leg immobilisation after injury is a necessary treatment but is also a known risk factor for the development of venous thromboembolism (VTE). This accounts for approximately 2% of all VTE cases which are potentially preventable with early pharmacological thromboprophylaxis.

Pharmacological agents are effective but have side effects and contra-indications which must be considered in balancing the risk versus potential benefit of their use.

The following are potential contraindications for the use of pharmacological agents:

- Coagulation disorder e.g. haemophilia
- Low platelet count (<75)
- Active or recent history of gastrointestinal bleed or peptic ulceration
- Recent cerebrovascular haemorrhage (within 6 months)
- Uncontrolled hypertension
- History of previous drug reaction to the agent including Heparin Induced Thrombocytopenia (HIT)
- Lumbar puncture or epidural within the last 4 hours or next 12 hours

In addition, the potential complications of VTE prophylaxis must be considered:

- Bleeding
- Heparin Induced Thrombocytopenia

In NHSL emergency departments we believe that all patients immobilised due to injury should have a risk assessment carried out. This should include consideration of potential complications and contraindications of management options. The risks and benefits of VTE prophylaxis for the individual patient should then be discussed with them to allow an informed decision by the patient on the appropriate management of their VTE risk.

4.2 Guidelines for specific conditions and procedures

Lower limb immobilisation after injury

For patients deemed at high risk of VTE consider pharmacological VTE prophylaxis with Rivaroxaban (first line) or Enoxaparin (second line) for patients who are non-weight bearing whose risk of VTE outweighs their risk of bleeding. Medication should be taken until cast is removed or changed to a functional brace and weight bearing.

People under the age of 18 years

Children under the age of 18 are excluded from the guideline.

4.3 Patients who are normally anti-coagulated or on anti-platelet medication

Patients who are already taking any anti-coagulants (warfarin or any other Direct Oral Anticoagulant (DOAC)) should not be given any prophylactic Rivaroxaban and should be treated with their usual anti-coagulant.

Patients who are already taking any anti-platelet medication (aspirin, clopidogrel, ticagrelor, dipyridamole, prasugrel) should not be prescribed any prophylactic rivaroxaban and should be treated with their usual anti-platelet.

4.4 Prescribing

The VTE risk assessment and prescribing guideline should be used to determine whether VTE thromboprophylaxis is required and which agent is appropriate.

First line drug choice is Rivaroxaban 10mg taken orally once daily.

Second line drug choice is Enoxaparin 40mg given by subcutaneous injection once daily. Alterations to dosage may be necessary due to patient weight and renal function (see section 4.5)

The first dose of anticoagulant will be given to the patient in the emergency department.

A baseline renal function and platelet function should be documented. This must have been taken within the last 3 months.

4.5 Discharge arrangements

Rivaroxaban (First Line) – The following arrangements should be made for patients commenced on rivaroxaban:

The medical, ACP or nursing staff will provide education to patients on rivaroxaban using the education checklist prior to discharge. Patients will also receive a rivaroxaban alert card and the NHSL DOAC patient information booklet.

The full treatment course of rivaroxaban will be provided from the ED as a 35 pack of 'to take out' (TTO) medication.

No routine blood monitoring should be required for patients treated with rivaroxaban. Patients should be advised to contact their ED if there were any concerns about bleeding or bruising.

Enoxaparin (Second line) – The following arrangements should be made for patients discharged home on enoxaparin:

The full course of Enoxaparin will be provided from the ED in the form of TTO medication.

Medical, ACP or Nursing staff should provide education and training on administration of enoxaparin to patients and/or carers. If it is thought that the patient and/or carer will not be able to administer the medicine safely then nursing staff should arrange a district nurse on discharge to administer the injection.

Sharps boxes should be provided to patients on discharge to allow the safe disposal of used enoxaparin syringes. The patient should return these to an agreed facility for safe disposal.

No routine blood monitoring should be required on discharge for patients being treated with enoxaparin. Patients should be advised to contact their ED should any side effects of bruising or bleeding occur.

4.5 Drug Information

Rivaroxaban Drug Information	
Indication	• Prevention of venous thromboembolism (VTE) in adult patients with temporary lower leg immobilisation due to injury **(unlicensed indication)**

Eligibility criteria	• Inclusion criteria – Patients who require lower leg immobilisation after injury who are deemed at high risk of VTE.
	• Exclusion criteria –
	  • Patients already on any anticoagulant
	  • Patients already on antiplatelet drugs
	  • Patients with active bleeding
	  • Patients with acquired or inherited Bleeding disorders
	  • Patients with previous Intracranial Haemorrhage/CVA <6months
	  • Patients with persistent uncontrolled hypertension >= 230/120mmHg
	  • Patients with upper GI bleed/peptic ulcer disease

Pre-Treatment Evaluation/Investigations	• Baseline U+Es, liver function tests, full blood count. (within the past 3 months) • Any drop in haemoglobin or low blood pressure which is otherwise unexplained should be investigated. Rivaroxaban does not require routine monitoring of INR/APPT during exposure.
Treatment Requirements	Rivaroxaban Dose (oral): • 10mg once daily for up to 35 days. • No dose adjustment required for body weight or age. • Swallowing difficulties/ Feeding tubes: The crushed tablet should be mixed with water or apple puree immediately prior to administration. Can be given in a small amount of water via a gastric tube and flushed with water. Rivaroxaban will be administered by nursing staff in the department and will be taken by the patient as an outpatient.
Precautions, contraindications and adverse effects	Care should be taken if patients are prescribed NSAIDs concomitantly with rivaroxaban. There is no known pharmacokinetic interaction; however there is a likely increased risk of bleeding if both agents are used.
Precautions, contraindications and adverse effects (continued)	Renal: Use not recommended in patients with creatinine clearance of <15ml/min. Cautioned in patients with a creatinine clearance of 15-29ml/minute due to increased plasma concentration. **Contraindications:** **<u>Rivaroxaban</u>**

	• Hypersensitivity to the active substance or to any of the excipients. • Active clinically significant bleeding. • Condition considered to be a significant risk for major bleeding. • Hepatic disease associated with coagulopathy and clinically relevant bleeding risk including cirrhotic patients with Child Pugh B and C. • Pregnancy and lactation. **Adverse effects:** **<u>Rivaroxaban</u>** • Bleeding, risk of haemorrhage, anaemia, thrombocytopenia • Nausea, dizziness, headache • Increased LFT's • Allergic reaction, pruritus, urticaria • Hypotension, wound secretion • Fever, oedema, reduced strength and energy
Investigations prior to subsequent treatment	N/A
Dose modifications e.g.	**<u>Rivaroxaban</u>** • Renal: Use not recommended in patients with creatinine clearance of <15ml/min. Cautioned in patients with creatinine clearance of 15-29 ml/min. • Hepatic: Contraindicated in hepatic disease associated with coagulopathy and clinically relevant bleeding risk including cirrhotic patients with Child Pugh B and C.
Audit/Evaluation of Response to Treatment	• Ongoing audit will take place to ensure that adherence to this clinical guideline is met.

Enoxaparin Drug Information	
Indication	• Prevention of venous thromboembolism (VTE) in adult patients with temporary lower leg immobilisation due to injury **(off label indication)**

Eligibility criteria	• Inclusion criteria – Patients who require lower leg immobilisation after injury who are deemed at high risk of VTE.
	• Exclusion criteria –
	  • Patients already on any anticoagulant drug
	  • Patients already on antiplatelet drug
	  • Patients with active bleeding
	  • Patients with acquired or inherited Bleeding disorders
	  • Patients with previous Intracranial Haemorrhage/CVA <6months
	  • Patients with persistent uncontrolled hypertension >= 230/120mmHg

Pre-Treatment Evaluation/Investigations	• Baseline U+Es, liver function tests, full blood count (within the last 3 months). • Any drop in haemoglobin or low blood pressure which is otherwise unexplained should be investigated. Enoxaparin does not require routine monitoring of INR/APPT during exposure. Dosage reduction in renal impairment advised. Dosage reduction to 20mg once daily if creatinine clearance less than 30ml/minute or body weight less than 50kg. Dosage increased if body weight is >120kg to 40mg twice daily. Enoxaparin is unlicensed if creatinine clearance is less than 15ml/min and therefore should not be prescribed.
Treatment Requirements	Enoxaparin Dose (subcutaneous injection): • Lower leg immobilisation due to injury: 40mg once daily. Duration up to 35 days. • Dose of enoxaparin should be reduced to 20mg once daily if body weight <50kg or if creatinine clearance< 30ml/minute. • Patients with extremes of body weight should have doses adjusted accordingly. Please see NHS Joint Formulary (appendix 1) https://www.medednhsl.com/meded/nhsl_formulary/index.asp?T=02&S=2.09 Enoxaparin will be administered by nursing staff in the department and will be administered by the patient/ patient carer/ district nurse on discharge.
Precautions, contraindications and adverse effects	**<u>Caution: Enoxaparin</u>** • Enoxaparin is to be used with extreme caution in patients with a history of heparin-induced thrombocytopenia with or without thrombosis. • Thrombocytopenia, should it occur, usually appears between the 5th and the 21st day following the beginning of therapy. Therefore, it is recommended that the platelet counts be measured before the initiation of therapy with enoxaparin sodium and then regularly thereafter during the treatment. • Can lead to hyperkalaemia due to suppressed adrenal secretion of

	aldosterone. • Dosage reduction in renal impairment advised. Dosage reduction to 20mg once daily if creatinine clearance less than 30ml/minute or body weight less than 50kg. **Contraindications: <u>Enoxaparin</u>** • acute bacterial endocarditis • active major bleeding • 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 • hypersensitivity to either enoxaparin sodium, heparin or its derivatives including other Low Molecular Weight Heparins • in patients receiving heparin for treatment rather than prophylaxis **Adverse effects: <u>Enoxaparin</u>** • Bleeding, risk of haemorrhage, thrombocytosis, thrombocytopenia, anaemia • Hepatic transaminases increased • Allergic reaction, pruritus, urticaria, erythema • Injection site haematoma, injection site pain, other injection site reaction • Headache • Hyperkalaemia **Cautions:** Hepatic, renal impairment, Pregnancy, breast feeding
Investigations prior to subsequent treatment	Baseline investigations (within the past 3 months) e.g. relevant biochemistry, LFT's, FBC etc. Any other tests specific to the drugs and the delivery plan for these tests.
Audit / Evaluation of Response to treatment	Ongoing audit will take place to ensure that adherence to clinical guideline is met.

5. <u>ROLES AND RESPONSIBILITIES</u>

<u>Rivaroxaban</u>

Nursing/ Medical/ACP: Completion of VTE prophylaxis risk assessment and prescribing form. Monitoring of full blood count, U+Es, LFTs, at baseline (within past 3 months). Liaison with primary care regarding district nurse for administration if required. Patient Education and issue of DOAC patient information booklet and Rivaroxaban Alert Card to individual patients.

Pharmacy: Supply of Rivaroxaban TTO pack to the emergency department.

Laboratory & imaging services: Processing of blood sample as inpatient if required.

Enoxaparin

Nursing/ Medical/ ACP: Completion of VTE prophylaxis risk assessment and prescribing form. Monitoring of full blood count, U+Es, LFTs, at baseline (within past 3 months). Liaison with primary care regarding district nurse for administration if required. Education of patient on administration of enoxaparin with regards to dosage, side effects, duration, and drug interactions as described above and provision of sharps boxes.

Pharmacy: Supply of Enoxaparin TTO packs to the emergency department.

Laboratory & imaging services: Processing of blood sample as inpatient (if required).

6. RESOURCE IMPLICATIONS

We had concerns regarding the increased time a patient may need to remain in the ED after diagnosis for blood test, counselling and education. Any delays in treatment has significant impact on safety in the ED including social distancing. The use of oral anticoagulation in the patient group is preferred as it will minimise the patients time in the department and also will streamline the patient journey and prevent the need for further healthcare contacts with their GP, pharmacy or anticoagulation services.

7. COMMUNICATION PLAN

This guideline will be published on NHS Lanarkshire's intranet, FirstPort and will be available to all staff.

8. QUALITY IMPROVEMENT – Monitoring and Review

The guideline will be reviewed every two years or sooner if further national guidance is published.

9. EQUALITY AND DIVERSITY IMPACT ASSESSMENT

This policy meets NHS Lanarkshire's EDIA [X] (tick box)

10. SUMMARY or FREQUENTLY ASKED QUESTIONS (FAQs)

See attached summary sheet

11. REFERENCES

1. Venous thromboembolism in over 16s: reducing the risk of hospital-acquired deep vein thrombosis or pulmonary embolism (NG89). National Institute for Health and Care Excellence. 2018, NICE guideline.
2. https://www.rcem.ac.uk/docs/College%20Guidelines/5z26.%20Thromboprophylaxis%20in%20ambulatory%20trauma%20patients%20requiring%20temporary%20limb%20immobilisation%20-%20(Flowchart)%20(Oct%202012).pdf

3. Bertoletti L, Righini M, Bounameaux H, st al. Acute thromboembolism after non-major orthopaedic surgery or post –traumatic limb immobilisation. Thromb Haemost 2011;

4. Horner D, Goodacre S, Pandor A, et al Thromboprophylaxis in lower limb immobilisation after injury (TiLLI)Emergency Medicine Journal 2020;37:36-41 2020

5. Long, A., Zhang, L., Zhang, Y. et al. Efficacy and safety of rivaroxaban versus low-molecular-weight heparin therapy in patients with lower limb fractures. J Thromb Thrombolysis 38, 299–305 (2014).